NET ZERO INITIATIVE

2020-2021
Annex 3

carbone4

NET ZERO INITIATIVE

Report of the methodological discussions

Working groups

The results presented here were the subject of a study conducted over several months, involving:

- Carbone 4's operational teams: Maxime Aboukrat, Luc Bachelet, Rodrigo Baranna, César Dugast, Zénon Vasselin
- NZI 2020 sponsor companies: EDF, ENGIE, Orange, Poste Immo, RATP, LVMH, Décathlon, Unima, Woodeum/WO2, Tikamoon, GRTgaz, Generali;

- Members of two Technical Working Groups (TWGs), one for Pillar B and the other for Pillar C. Each TWG consisted of:
    - experts from French and international organizations,
    - members of NZI 2020 sponsor companies who volunteered to participate in the technical discussions.

The composition of the two working groups is shown below.

NB: The conclusions shown in this report do not necessarily reflect the views of each working group member.

Name	Organization	Country	TWG B	TWG C
Richard Baron	2050 Pathways / ECF	France		✓
Fanny Fleuriot	ADEME	France	✓	✓
Daniele Pernigotti	Aequilibria	Italie	✓	
Alexandre Rambaud	AgroParisTech	France		✓
Jonathan Guyot	All4Trees	France		✓
Cécile Goube	Alliance Foret Bois	France		✓
Juliette Griton	Association BBCA	France	✓	
Damien Huet	Association Bilan Carbone	France	✓	
Gilles Dufrasne	Carbon Market Watch	Belgique	✓	✓
Manon Castagné	CCFD-Terre Solidaire	France	✓	
Claire Fyson	ClimateAnalytics	Allemagne		✓
M.J. Mace	ClimateAnalytics	Allemagne	✓	
Olivier Gleizes	CNPF	France		✓

Émilie Aubry	Décathlon	France	✓	✓
Anne Grau	EDF	France	✓	
Thibaut Brac de la Perriere	EDF	France	✓	✓
Christine Fedigan	ENGIE	France	✓	✓
David Laurent	EpE	France	✓	
Matthieu Jousset	Fondation GoodPlanet	France	✓	
Adeline Favrel	France Nature Environnement (FNE)	France		✓
François Garreau	Generali	France	✓	✓
Tani Colbert-Sangree	GHG Management Institute	États-Unis	✓	
Alban Thomas	GRTgaz	France	✓	
Alice Saurin	GRTgaz	France	✓	
Pascale Guillo-Lohan	GRTgaz	France		✓
Johannes Svensson	IDDRI	France	✓	✓
Yann Briand	IDDRI	France	✓	✓
Claudine Foucherot	Institute for Climate Economics (I4CE)	France	✓	✓
Julia Grimault	Institute for Climate Economics (I4CE)	France		✓
Hélène Valade	LVMH	France	✓	✓
Arthur Laurent	Microsol	France	✓	
Clément Bultheel	Ministère de la Transition Ecologique (MTE)	France	✓	✓
Emmanuelle Huet	Ministère de la Transition Ecologique (MTE)	France	✓	✓
Carsten Warnecke	NewClimate Institute	Allemagne	✓	
Thomas Day	NewClimate Institute	Allemagne	✓	
Annette Cowie	NSW Department of Primary Industries	Australie		✓
Philippe Tuzzolino	Orange	France	✓	✓
Eli Mitchell-Larson	Oxford University	Royaume-Uni	✓	✓
Thomas Hale	Oxford University	Royaume-Uni	✓	✓
Marie-Thérèse Durand	Poste Immo	France	✓	✓
Aurélien Cartal	PUR Projet	France	✓	✓
Aurélia Menacer	RATP	France	✓	✓

Stéphane Hallaire	Reforest'action	France		✓
Minh Cuong Le Quan	Staterre	France		✓
Derik Broekhoff	Stockholm Environment Institute (SEI)	États-Unis	✓	✓
Yoann Lechat	Tikamoon	France		✓
Gajanana Hegde	UNFCCC	Suisse	✓	
Miguel Naranjo Gonzalez	UNFCCC	Suisse	✓	✓
Panna Siyag	UNFCCC	Suisse		✓
Philippe Blais	Unima	France, Madagascar	✓	✓
Augustin Fragnière	Université de Lausanne	Suisse	✓	✓
Tiina Pajula	VTT	Finlande	✓	
Bastien Bouteloup	Woodeum/WO2	France	✓	✓
David Rich	World Resources Institute (WRI)	États-Unis	✓	
Matt Ramlow	World Resources Institute (WRI)	États-Unis		✓
Brad Schallert	WWF US	États-Unis	✓	

Annex 3: Report of the methodological discussions

The aim of this section is to describe the organization of the work carried out in 2020, how the issues were addressed, and the pathway to their resolution. It is reserved for the curious reader seeking to understand the details of the developments.

1. Preliminary decision: structure of the problem

The first decision consisted in **determining how to break down the problem to be addressed.**

A first option was to structure the problem around the three classical blocks:

- **Pillar A,** containing the company's direct (A1) and indirect (A2) emissions;
- **Pillar B,** containing B2 "Emissions avoided by products and services" and B3 "Emissions avoided by carbon finance";
- **Pillar C,** containing C1 "direct removals", C2 "indirect removals" and C3 "removals outside the value chain".

This option had the advantage of conforming to the formalism initially adopted by Net Zero Initiative, and of keeping the homogeneity of the units (induced / avoided / negative emissions). Another reason was that the Science-based Targets Initiative (SBTi) was also beginning to make a strict distinction between type B carbon credits (which they call "*offset*") and type C credits (which they call "*neutralization*") in their Net Zero standard.[1]

A second option consisted in creating "operationally similar" groups, even if it meant mixing the units together.

- For example, it seemed interesting to create a single **"Carbon Finance**" category grouping categories B3 and C3 together . Although the units were not the same, the idea was that carbon finance was an object generally considered as a whole. Oxford University's work on offsetting[2], for example, proposes not two but five different categories for credits, depending in particular on the permanence of storage. The NewClimate Institute's Climate Responsibility approach[3] considers that companies should set themselves a global envelope for financing

[1] Science-based Targets Initiative, *Foundations for science-based net-zero target setting in the corporate sector*, 2020.
[2] Eli Mitchell-Larson et *al.*, *The Oxford Principles for Net Zero Aligned Carbon Offsetting*, 2020. https://www.smithschool.ox.ac.uk/publications/reports/Oxford-Offsetting-Principles-2020.pdf.
[3] https://newclimate.org/climateresponsibility.

carbon projects, regardless of the physical nature of the projects to be financed (i.e. on B3 and C3 indistinctly).

- Similarly, it might have seemed appropriate to combine the parts of Pillars A and C relating to a company's carbon inventory of emissions and removals in its value chain into a single category, called **"corporate climate strategy"**, i.e. the whole of Pillar A (direct and indirect emissions) and Pillar C, categories C1 and C2 (direct and indirect removals).

- A third category would have remained, i.e. B3 "Emissions avoided by products and services". It should be noted that this second division is the one proposed by ADEME in its opinion on carbon neutrality, and is the French position defended at ISO in the standardization of carbon neutrality.

In the end, the choice was made to retain the "classic" three-Pillar approach to the work. This simply resulted in the creation of "Pillar B" / "Pillar C" working groups rather than "carbon finance" / "climate strategy" / "products and services" working groups. Nevertheless, both visions remain fully relevant and complementary to each other: only the way of "bundling" between the categories changes.

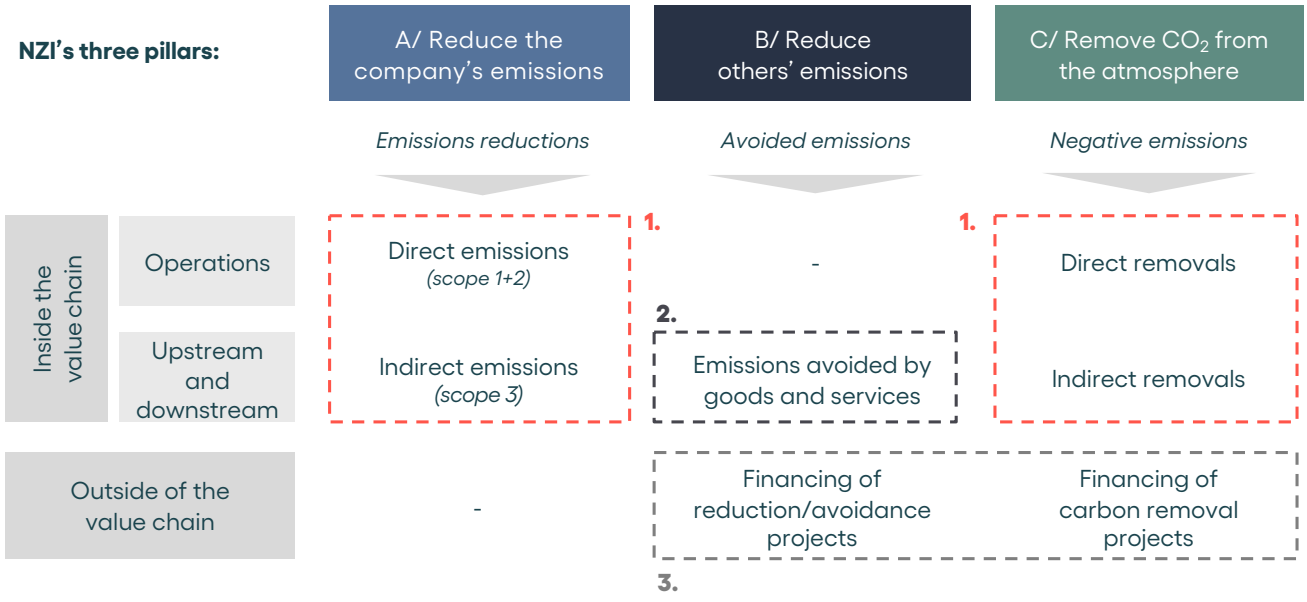


Figure 38 - Highlighting two ways of grouping the NZI matrix categories: A/B/C (homogeneity of units) or 1/2/3 (homogeneity of practices)

2. Methodological discussions on Pillar B

The primary objective of the Net Zero Initiative's work is to provide companies with a benchmark of good practice to maximize their climate action. The concept of avoided emissions has the potential to be a highly effective indicator for measuring one facet of the contribution a company can make to global neutrality. However, the concept is still too vague and not sufficiently harmonized, making this indicator, at best, a sterile measure involving poor resource mobilization, or at worst, an instrument of greenwashing.

Significant groundwork has been done to identify problems with the current definition of avoided emissions, and methodological solutions that can be applied to make this indicator an effective measure of contribution to global neutrality for businesses. This section lists the main issues identified and for which Net Zero Initiative proposes a methodological response in Section III.

Each issue is dealt with in three stages: description of the problem, presentation of possible options, and final decision.

Issue 1: Should emissions avoided by products or services be accounted for together or separately from those triggered by the financing of emission reduction projects outside the value chain?

Issue 2: What is the right metric to quantify a contribution to decarbonation?

Issue 3: How can a good baseline scenario be defined?

Issue 4: How can "real reductions" be distinguished from "lower increases"?

Issue 5: How should avoided emissions be distributed between different companies contributing to the same product or service?

Issue 6: How can an ambitious, achievable and fair target for avoided emissions be established?

A. Issue 1

Should emissions avoided by products or services be accounted for together or separately from those triggered by funding emission reduction projects outside the value chain?

Description of the issue

An organization can contribute to the decarbonation of third parties in two ways:
- Either through the effect of its products and services sold which replace more carbon-intensive use by end customers;
- Or through the financing of emission reduction projects outside its value chain (purchases of certified emission reductions, direct equity investments in projects, low-carbon energy contracts under certain conditions, etc.).

Since these contributions can be expressed in both tons of CO_2e avoided, it is possible to count them "in the same basket". However, as these contributions are of a different nature, it is legitimate to ask whether it is not more relevant to count them separately.

Outline of options

- **Option 1:** Account for emissions avoided by products or services, or by financing reduction projects under a single "Pillar B" account.
    - Accounting: one account,
    - Target: one target.
- **Option 2:** Separate accounting for emissions avoided by products or services, or by financing reduction projects
    - Accounting: two separate accounts,
    - Objective: two separate objectives, efforts in one account cannot offset efforts to achieve the objective in the other account.

Final choice

The methodological choice made is **option 2: to account separately for emissions avoided by products or services, or by the financing reduction projects.**

The decisive element that justifies this choice is that the methodologies for calculating emissions avoided by products and services are still poorly regulated, whereas those for financing reduction projects are much better regulated. Not making a distinction between these two contributions seems dangerous, since it masks the efforts made on one or the other lever of contribution and leaves the door open to practices that are convenient for achieving the objectives.

B. Issue 2

What is the right metric to quantify a contribution to decarbonation?

Description of the issue

The calculation of avoided emissions, whether for B2 or B3, depends on a reference scenario. The choice of the reference scenario is currently very poorly defined, particularly for B2, and the "avoided emissions" indicator therefore appears to be insufficiently robust (see issue 3). Indeed, how can one use a performance indicator whose measurement varies according to different conceptions?

Moreover, by using avoided tCO_2e as the unit of measurement, there is a temptation to subtract avoided emissions (Pillar B) from induced emissions (Pillar A), since these two indicators have the

same unit. However, as we demonstrate at greater length in the first version of the Net Zero Initiative benchmark published in April 2020, this leads to counter-productive pitfalls in the fight against climate change, such as the abusive use of offsetting to achieve "zero".

One of Net Zero Initiative's lines of research in 2020 was therefore to assess the relevance of the current tCO_2e metric for quantifying the contribution to decarbonation, and to explore the possibility of using another.

B2 - Products and services

Outline of options

For products and services, the indicator is primarily used to assess whether the company's business model contributes to the decarbonation of the economy. The indicator must be capable of answering the following question: are the products or services marketed by the company relevant in a world that must decarbonize at a global rate of -6% per year?

One solution envisaged by Net Zero Initiative was to draw up a list of goods and services "useful for the transition". In other words, a taxonomy.

Establishing a taxonomy of emission-avoiding products or services opens up possibilities for the metric used to assess the alignment of a company's business model with the low-carbon transition. It also frees us from the problem of the reference scenario. Indeed, products or services could be assessed according to their intrinsic characteristics, or the taxonomy could standardize the reference scenarios.

- **Option 1:** Establish a taxonomy of products and services useful for the transition
    - Option 1.1: metric and target in tCO_2e avoided, the product/service baseline is defined by the taxonomy.
    - Option 1.2: metric and target in carbon intensity tCO_2e/unit (the unit would depend on the product or service: kWh for electricity, ton for aluminum, etc.). The taxonomy would set the trajectory of carbon intensity thresholds to be followed. This is how the European Taxonomy currently works.[4]
    - Option 1.3: metric and target in k€ generated by the sale of products or services compatible with the taxonomy.
    - Option 1.4: metric and target set on the basis of a list of actions to be carried out in a given territory. For example, number of electric charging stations, number of heat pumps installed, m^2 of building renovated, km of railway built, etc.

- **Option 2:** Decide not to establish a taxonomy of products and services useful for the transition

[4] "Technical annex to the TEG final report on the EU taxonomy", *European Commission - European Commission*. https://ec.europa.eu/info/files/200309-sustainable-finance-teg-final-report-taxonomy-annexes_en

- Option 2.1: metric and target in tCO_2e avoided, an approach historically used for the metric, but no target setting methodology currently exists.
- Option 2.2: Carbon intensity metric and target tCO_2e/unit.

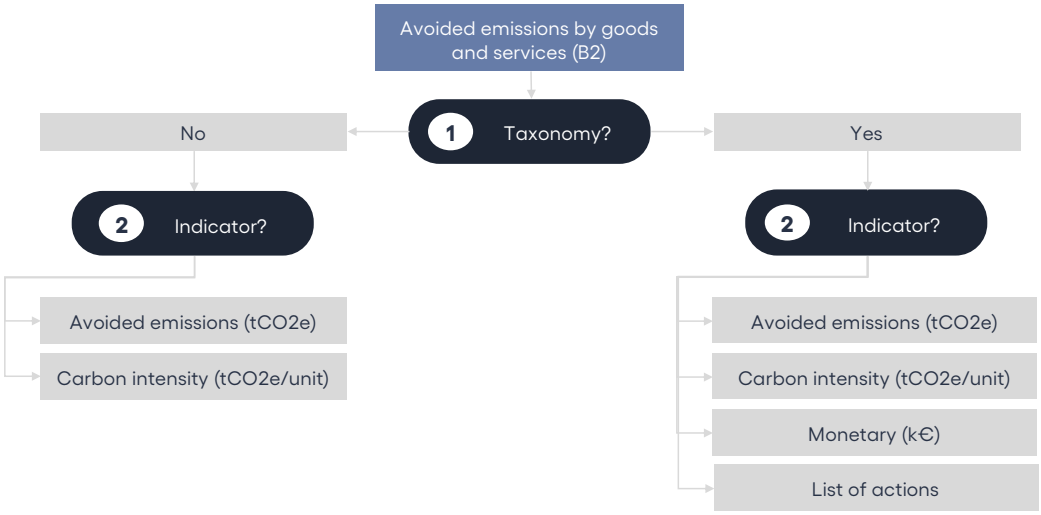


Figure 39 – Alternatives mapping for issue 2 – products and services

Final choice

The Net Zero Initiative has discarded the idea of establishing a taxonomy of products and services useful for the transition in its recommendations. Indeed, although the establishment of a taxonomy would have considerable advantages, such as the fact that the reference scenarios would be more easily standardized, there would also be many disadvantages that would be counterproductive in encouraging companies to contribute to decarbonation. Among those identified, the most decisive is the fact that, by definition, **a taxonomy is non-exhaustive and may be biased:** many products and services would not fit into the boxes and their positive impact would not be valued. Furthermore, a taxonomy that bases the eligibility of products/services on their intrinsic carbon performance (which would not define the baseline scenarios) would not reflect the physical reality of avoided emissions: the latter depend on the context in which the product or service replaces a more carbon-intensive product or service.

Options 1.1 to 1.4 are therefore excluded from the recommendations.

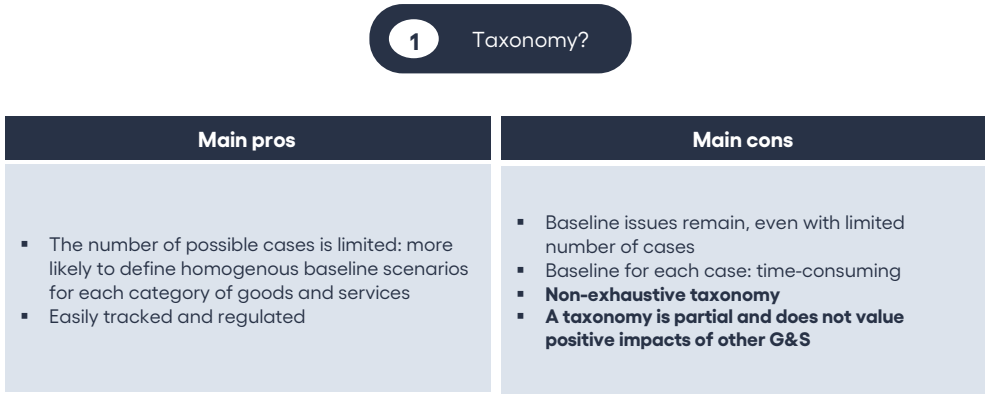


Figure 40 – Advantages and disadvantages of a taxonomy of products and services

In its recommendations, the Net Zero Initiative has discarded the idea of using a carbon intensity metric (tCO_2e/unit) to quantify the contribution to decarbonation made by the sale of products and services. A carbon intensity metric has the advantage that it does not pose baseline scenario problems (comparison to a threshold or with similar products/services) and removes the temptation to subtract avoided emissions from induced emissions. But such a metric does not take into account **the absolute impact** of a product or service and is not consistent with what the atmosphere "sees". Also, a carbon intensity metric **masks the effects of product use** (e.g., the rebound effect).

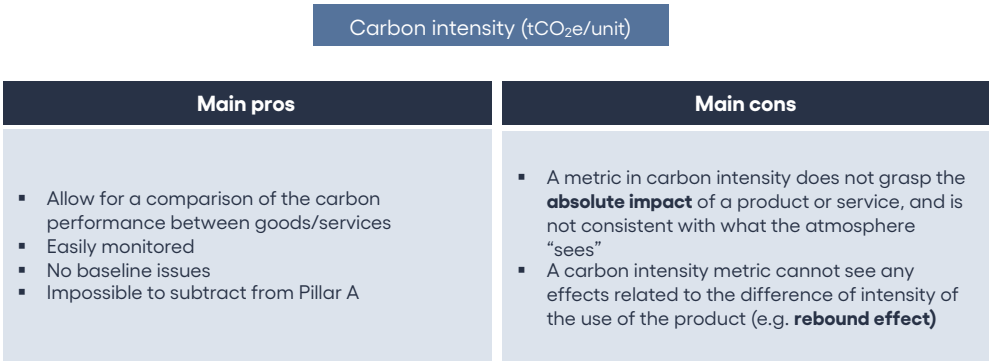


Figure 41 – Advantages and disadvantages of a carbon intensity metric

The methodological choice retained by the Net Zero Initiative is therefore option 2.1: metric and target in tCO_2e avoided. In addition, the Net Zero Initiative recommends that the **share of turnover corresponding to the sales of products and services that are the subject of the avoided emissions calculated should also be communicated,** in order to give an idea of the "green" share of the company's sales.[5]

[5] This is the idea behind the European green taxonomy, which consists in estimating the % of sales made on so-called 'green' products. However, what is considered 'green' here does not depend on a taxonomy, but on the existence or not of avoided emissions for the product considered in a given sales context. It is therefore possible that some products considered 'green' by the taxonomy are not considered 'green' by the NZI because they do not avoid any emissions (e.g., electric vehicles sold in a territory where the electricity mix is too carbon intensive) and that, conversely, some products that avoid emissions are not considered 'green' in the European taxonomy.

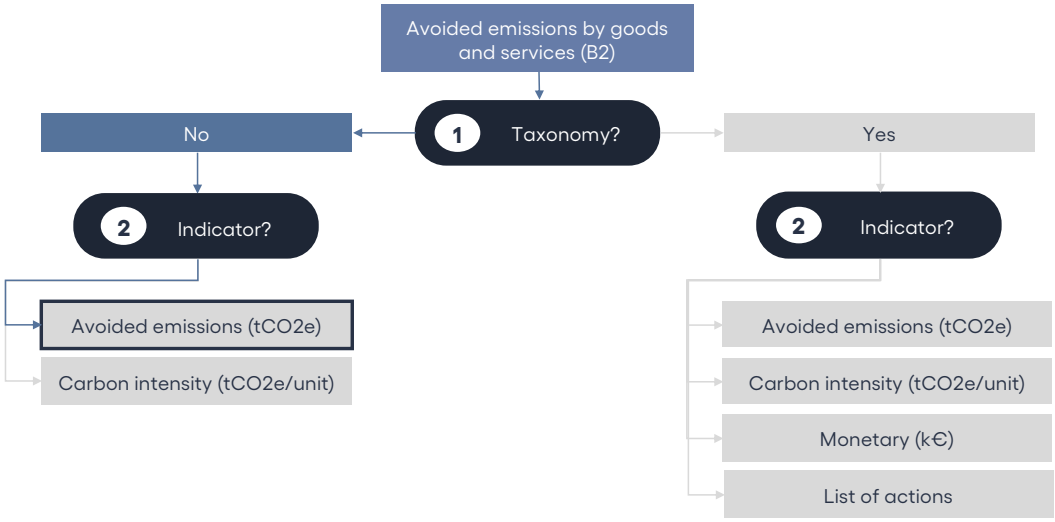


Figure 42 – Final choice of indicators for B2 – products and services

B3 - Financing of avoidance projects outside the value chain

This category is concerned with determining which indicator is most relevant for reporting on a company's action in relation to the initiation of emission reduction or avoidance projects outside its value chain.
The metric traditionally used for this type of action is the quantity of tons avoided or reduced: when a company "offsets", i.e. buys carbon credits and withdraws them, it generally communicates on the number of credits purchased (i.e. the number of tons avoided).
The challenge of the discussion with the TWG was to identify alternatives.

Outline of choices

In addition to the avoided emissions metric, another natural candidate for quantifying the contribution to decarbonation is to quantify the financial amount committed by the company to this end.

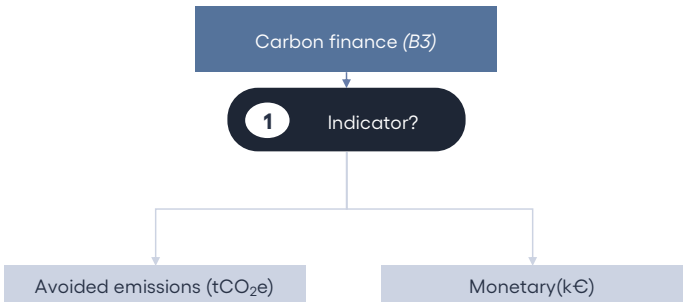


Figure 43 – Two possible metrics for category B3

The benefits of the language in tons of CO_2 avoided are:

- That it is the most commonly used metric when talking about carbon finance outside the value chain (it is generally appreciated, in terms of corporate communications, to be able to talk about the 'outcomes' of finance, i.e. the concrete CO_2 reductions that the finance helps to bring about).
- That this is the metric chosen for B2 - Products and Services, making Pillar B consistent.
- That it is a physical unit, and that the NZI benchmark is structured around the physical reality of things: Pillars A, B and C correspond to indicators that are 'physically' distinct from each other.

Nevertheless, it is possible to criticize a number of drawbacks with regard to this metric:

- A contribution expressed in tons of CO_2 avoided always runs the risk of being subtracted from the company's emissions, in the rationale of "offsetting" / canceling emissions, a vision rejected by the Net Zero Initiative.
- Looking only at the tons avoided can lead to a "race to the bottom" to get hold of the cheapest possible credits. The danger of this practice is to drive prices down and put pressure on project developers.
- The metric of tons avoided does not do justice to the necessary financing of long-term projects that are useful for the climate but unable to display immediate results.

The benefits of language based on funding amount are as follows:

- It would be the perfect metric to switch to a "contribution" rather than an "offset" approach.
- The risk of a subtraction ("offset") from Pillar A disappears.
- The fact of not focusing on a quantity of CO_2, but more globally on an amount of financing, makes it possible to value the financing of projects that are not immediately effective but are capital-intensive ("high-hanging fruit"), such as research and development projects.
- More generally, this opens the door to the notion of a contribution to decarbonation outside the voluntary carbon offset market, giving recognition to more exotic instruments such as "practice-based credits"[6], credits that would pay for virtuous practices for the climate rather than results in terms of reduction.
- This is consistent with one of the options proposed by the SBTi in its consultation on the net-zero standard under development[7], which proposes the possibility of tracking the financial contribution for the purchase of avoidance credits, instead of tracking the avoided tons themselves.

The disadvantages of the financial metric are as follows:

- Finally, the fight against climate change must somehow keep a link with the notion of mitigation and concrete reduction results, something that a financial metric is not able to capture.[8]
- The focus on the amount of funding may no longer favor the most economically efficient projects, i.e. those with the lowest cost per ton avoided.

[6] Carbon Market Watch (2020), *Above and Beyond Carbon Offsetting. Alternatives to Compensation for Climate Action and Sustainable Development*. https://carbonmarketwatch.org/wp-content/uploads/2020/12/AboveAndBeyondCarbonOffsetting.pdf.
[7] SBTI (2021), Foundations for net-zero target-setting in the corporate sector.
[8] However, it could be argued that it is not necessary for the company itself to know the concrete results of its financing. If the project leads to positive decarbonation results, they will be captured by the national inventory of the host country.

Final choice

Sensitive to the arguments in favor of either metric, the Net Zero Initiative recommends **keeping both metrics together** and inviting companies to report both the amount of emissions avoided and the amount of associated funding. The NZI also points out that it is obviously not possible to subtract this amount of avoided tons from the company's Pillar A.

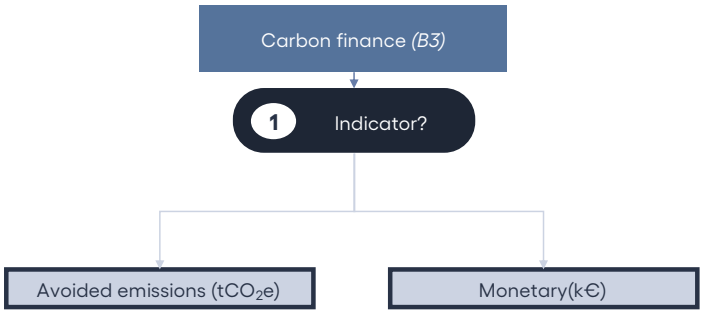


Figure 44 – For B3, the choice is made to keep both metrics

C. Issue 3

Calculation of avoided emissions and choice of baseline scenario

Description of the issue

One of the key factors in the estimation of avoided emissions is the definition of the reference scenario against which the solution analyzed will be compared. As there are no standards that provide precise recommendations on this subject, it is the responsibility of the analyst to define the most appropriate baseline scenario. This brings a high degree of subjectivity to the analysis, which leads to a high degree of methodological heterogeneity between different actors.

Depending on the baseline scenario defined, two companies offering similar products in the same market may claim very different amounts of avoided emissions per product.

For example, suppose two car manufacturers, NewCars and ModernCars, have the same sales volume, address similar markets and offer equivalent vehicles in terms of carbon performance. In order to value the low-carbon aspect of their vehicles, both companies decide to conduct an avoided emissions analysis.

ModernCars assumes that its customers would not have renewed their vehicle fleets if the ModernCars model was not available on the market. In this case, the analyst collects data on the current fleets of all ModernCars customers and uses it to construct the baseline scenario. ModernCars adopts a "business as usual" baseline scenario.

NewCars assumes that other competing models are available on the market and that its customers would have renewed their fleets in all cases. The assumption is that carbon performance is the main criterion for its customers in choosing models for their new fleets. Thus, in the absence of the NewCars model, its customers would have purchased the lowest emission model available. In this case, the analyst retrieves data on NewCars' best-performing competitor and uses it to construct the baseline scenario. NewCars adopts a *"best case in the market"* scenario.
The results of both analyses are shown in the image below.

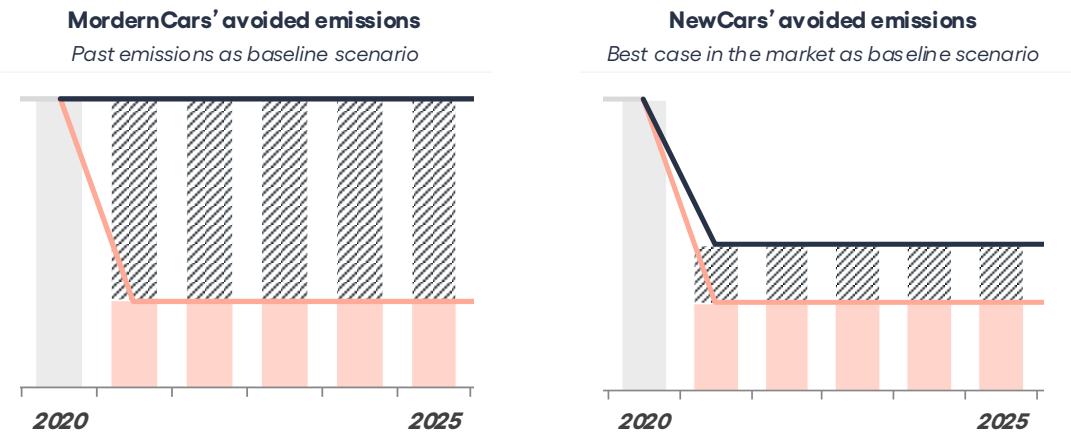


Figure 45 – Comparison of emissions avoided by ModernCars and NewCars

We can see that the previous situation (grey curves and bars) is the same for both manufacturers, as well as the situation with the products analyzed (blue curves and bars). However, due to different methodological choices concerning the reference scenarios (green curve), ModernCars and NewCars claim very different amounts of avoided emissions.

This example shows us that for the same physical reality - previous situation and real situation with the products sold - the results can diverge greatly depending on the hypothetical situation - reference scenario - considered.

In order to ensure the homogeneity of methodologies and the comparability of avoided emissions of different actors, it is essential to have a common, sufficiently precise and operational reference framework that makes recommendations on the definition of reference scenarios.

Outline of options

Currently, several types of baseline scenario can be found in avoided emissions analyses. The most common types are:

- **Previous situation**: describes the situation before the deployment of the solution analyzed.
- **Best case in the market:** considers the deployment of the best performing competing solution available on the market.

- **Market average:** considers the deployment of a solution corresponding to an average performance of all the solutions available on the market.
- **Regulatory market evolution:** also considers an average performance of existing solutions, but adds to this the projection of this performance linked to the evolution of the relevant regulations during the lifetime of the solution analyzed.
- **Market trend:** also considers an average performance of existing solutions and the projection of this performance linked to the evolution of regulation during the lifetime of the solution analyzed, but adds the projection of the performance linked to other market trends (technological, economic, behavioral, etc.)

N.B.: This list is not intended to be exhaustive.

Final choice

The baseline scenario should describe the most likely situation that would have occurred in the absence of the solution studied. In this way, **the definition of the baseline scenario depends on the context in which the solution is marketed** and cannot be standardized to suit all contexts.

The Net Zero Initiative could not adopt one alternative at the expense of the others mentioned above, without jeopardizing the relevance in different contexts.

The Net Zero Initiative has chosen to formulate recommendations that will guide the analyst in defining the right reference scenario based on the consideration of several parameters, while taking into account the specific context of the solution studied (see "Recommendations" section).

D. Issue 4

How to distinguish between "real reductions" and "lower increases"?

Description of the issue

In addition to the heterogeneity in the choice of reference scenarios (see issue 3), avoided emissions, in their current definition, suffer from a physical imprecision. Whether for B2 (products and services) or B3 (carbon finance), avoided emissions can represent either

- A real reduction in emissions compared to a previous more carbon-intensive situation;
- A lower increase in emissions compared to a counterfactual scenario that never happened.

These two types of avoided emissions are not currently distinguished, although they are two different physical realities. Let us look at some examples.

NB: All the following situations are for a comparable scope and product/service function, and are considered over the whole life cycle.

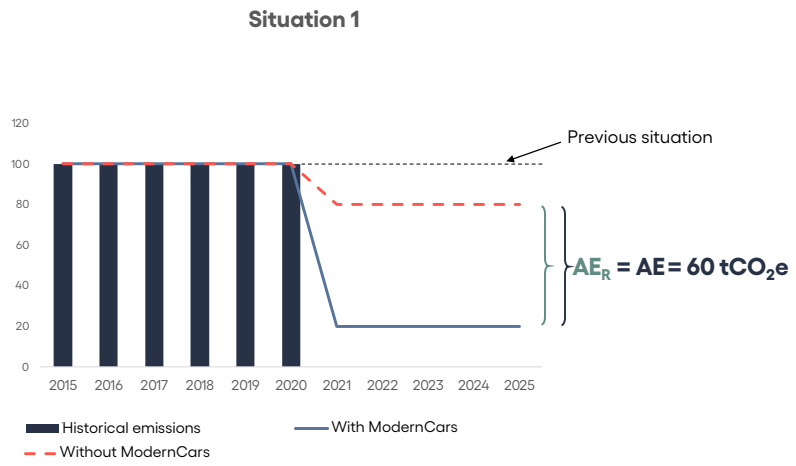
Example 1: Transport sector
Let us imagine a company, ModernCars, that manufactures low-carbon cars. ModernCars sells a fleet of its low-carbon vehicles in 2020 to a corporate customer, and seeks to calculate the emissions avoided by this fleet.

Let us now imagine two situations:

- Situation 1:
  - ModernCars' corporate client wishes to **renew** its fleet of vehicles.
  - A study determines that, without ModernCars, the client company would have purchased a fleet of vehicles with average carbon performance on the market, manufactured by a company competing with ModernCars.
  - The new fleet of vehicles then **replaces** the company's old fleet, which leaves the fleet in circulation.

- Situation 2:
  - ModernCars' customer company wishes to **expand** its fleet of vehicles.
  - A study determines that, without ModernCars, the client company would have purchased a fleet of vehicles of average carbon performance on the market, manufactured by a company competing with ModernCars.
  - The new fleet of vehicles meets the customer's need for additional vehicles: it is therefore **added** to the existing fleet and the old vehicles are still in use

- Parameters for situations 1 and 2:
  - The old fleet of vehicles emits 100tCO_2e per year,
  - The new fleet of ModernCars emits 20tCO_2e per year,
  - The new fleet of mid-market carbon performance vehicles emits 80tCO_2e per year.



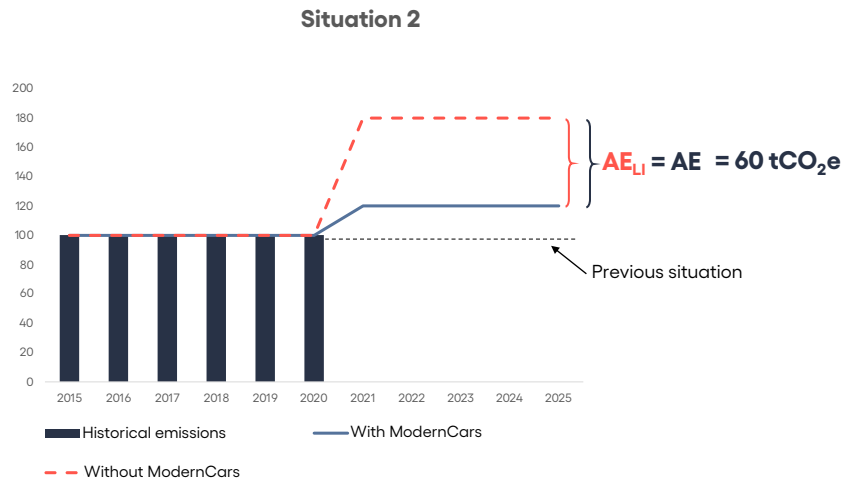


Figure 46 - Illustration of emisisons avoided by ModernCars in situation 1 and 2

In both situations, ModernCars sells the same fleet of vehicles, purchased by the same customer company. In both situations, the calculation of avoided emissions gives the same result (60 tCO_2e avoided).

But in situation 1, where the old vehicles are no longer in use, the atmosphere sees a real reduction in emissions compared to before the sale of the vehicle fleet. In situation 2, on the other hand, the sale of the ModernCars fleet only minimizes the increase in emissions, without causing any absolute reduction in emissions. From the point of view of the atmosphere and the climate problem, the avoided emissions calculated for the two situations 1 and 2 therefore do not at all reflect the same physical reality.

Example 2: Building sector

Let us imagine a company, BuildingFuture, which has two distinct activities. Its first activity is to **renovate** existing buildings to make them more energy efficient. Its second business is to **build** new buildings that are highly energy and carbon efficient.

Let us now imagine two situations in which BuildingFuture carries out its two activities for a company that wishes, in the first case, to renovate its offices and, in the second case, to build new offices.

- Situation 1:
  - BuildingFuture renovates an existing office building stock.
  - Without BuildingFuture, the client company would not have renovated its existing office building.
  - In this situation the building stock remains constant.
- Situation 2:
  - BuildingFuture builds a new building stock.
  - Without BuildingFuture, the client company would have had the new building stock built by a competitor with a market average carbon performance.
  - In this situation, the building stock increases.
- Parameters for situations 1 and 2:

- The existing building stock emits 100 $ktCO_2e$ per year.
- The existing building stock renovated by BuildingFuture emits 60 $ktCO_2e$ per year.
- The new building stock constructed by BuildingFuture emits 50 $ktCO_2e$ per year.
- The new building stock with an average market carbon performance emits 90 $ktCO_2e$ per year.

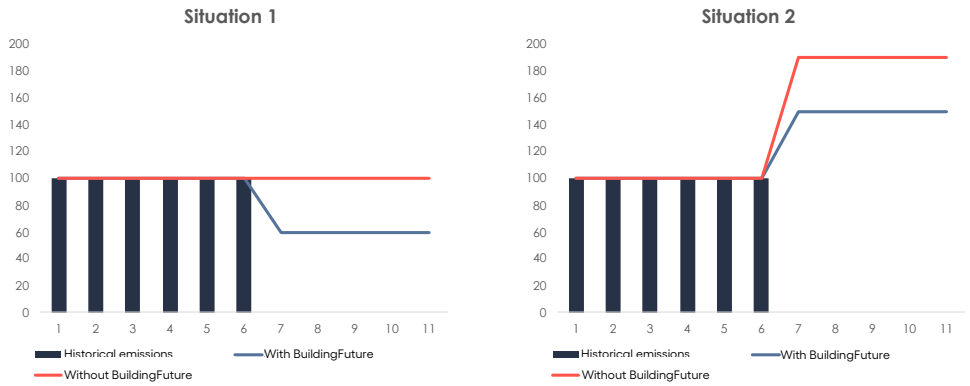


Figure 47 – Illustration of BuildingFuture avoided emissions in situation 1 and 2

In both situations, the baseline scenarios are well defined and the calculation of the emissions avoided by BuildingFuture gives the same result.

But again, these avoided emissions do not correspond to the same physical flows, with for situation 1 a real reduction of emissions, and for situation 2 a lower increase of emissions.

Outline of options:

- **Option 1:** Remain with the current definition, and not distinguish between these two types of avoided emissions.
- **Option 2:** Change the definition of avoided emissions to distinguish between emission reductions and reduced increases.

Final choice

The Net Zero Initiative has chosen option 2: to modify the definition of avoided emissions to distinguish between emission reductions and lower increases. Indeed, we believe that in order to properly manage climate action, we need effective indicators that can quantify contributions to decarbonation in a physically tangible way.

The Net Zero Initiative benchmark therefore proposes a change in the definition of avoided emissions, which is presented in the "Recommendations" chapter.

E. Issue 5

How should avoided emissions be distributed among the different companies in the value chain of the same product or service?

Description of the issue

Once the avoided emissions have been estimated and the distinction between AE_R (avoided emissions by reduction) and AE_{LI} (avoided emissions by lower increase) has been made, each actor in the value chain of the solution studied would be tempted to claim the share of these avoided emissions that belongs to them.

To define each actor's share, an allocation rule must be applied and, depending on the rule used, the results can vary significantly.

As an example, let us take the case of NewCars, a manufacturer of low-carbon vehicles. Let us assume that its vehicles are all electric and equipped with a battery from one of the following suppliers: EVBattery, BestCharge and MegaPower. Each supplier equips ⅓ NewCars and their batteries are equivalent to each other in terms of technical specifications, carbon performance and price.

Taking advantage of the avoided emissions study conducted by NewCars, the three battery suppliers also decided to communicate their avoided emissions. To do this, each simply applied an allocation rule to the results obtained by NewCars.

EVBattery, inspired by the distribution of financial benefits, considers that avoided emissions should be allocated to the different actors in the value chain according to their added value. In this case, the analyst compares the added value of EVBattery to the total cost of ownership (TCO) of a NewCars vehicle and finds that the added value of EVBattery is 15% of the TCO.

BestCharge decides to use the ratio of battery mass to total vehicle mass as the allocation key, as the energy consumption of the car is a function of the total mass (among other parameters). In this case, the analyst recovers the masses of the battery and the car and finds that the battery corresponds to 21% of the total mass of the car.

MegaPower believes that as this is a measure of the positive climate impact of these vehicles, it is most relevant to use the negative climate impact of each actor to allocate the avoided emissions. In this case, the analyst compares the emissions induced by the manufacture of the battery to the total emissions in the lifetime of the NewCars and finds that the battery corresponds to 9% of the total induced emissions.

The calculated avoided emissions for each supplier are therefore

- EVBattery: 15% x ⅓ = **5%** of NewCars' avoided emissions
- BestCharge: 21% x ⅓ = **7%** of NewCars' avoided emissions
- MegaPower: 9% x ⅓ = **3%** of NewCars' avoided emissions

This example shows that for a given physical reality and reference situation, the same actor in the value chain can claim different quantities of avoided emissions depending on the allocation rule applied.

Outline of options:

As illustrated by the previous example, several allocation rules are possible for the distribution of the avoided emissions of a solution among the different actors of the value chain. The most common allocation keys are:

- Economic allocation
    - Added value: the avoided emissions are distributed among the different actors of the value chain according to their added values in relation to the total value of the solution studied.

- Physical allocation
    - Mass: the avoided emissions are distributed among the different actors of the value chain according to their added values in relation to the total value of the solution studied.
    - Volume: the avoided emissions are distributed among the different actors in the value chain according to the volume of materials they supply in relation to the total volume of inputs to the solution studied.
    - Energy: Avoided emissions are distributed among the different actors in the value chain according to their energy inputs in relation to the total energy consumed in the life cycle of the solution studied.
    - Chemical composition: the avoided emissions are allocated to the different actors in the value chain according to the fraction of the products they supply in the chemical composition of the solution studied.

- Other allocation
    - Induced emissions: the avoided emissions are allocated to the different actors in the value chain according to the emissions induced by the manufacture of the components they supply in relation to the total emissions in the life cycle of the solution studied.

Note: This list is not intended to be exhaustive.

Final choice

The main purpose of estimating a carbon footprint is to measure an organization's dependence on greenhouse gas emissions. To this end, all the emissions in the value chain are counted, whether they occur upstream or downstream of the organization's operations.

The GHG Protocol states that the use of allocation rules should be avoided and minimized in the estimation of a carbon footprint. However, allocation may be necessary in some cases, especially when the primary data collected cover a broader range than the organization's scope 3.

The analysis of avoided emissions requires the consideration of all emissions in the value chain of the solution studied and that of the reference scenario. In order to keep the perspective of interdependence between the different actors, the Net Zero Initiative recommends **that no allocation rule be applied in the estimation of avoided emissions, thereby allowing each actor to carry over the entirety of the emissions avoided by the proposed solution.**

However, to ensure consistency with Pillar A - induced emissions, the Net Zero Initiative recommends that the scope of analysis and reporting be identical to that of the carbon footprint. In this way, **an organization can only claim avoided emissions from a solution if all the induced emissions from the value chain of that solution are included in its carbon footprint.**
It should be noted that, like induced emissions (scope 1+2+3), avoided emissions do not have the property of uniqueness either. In other words, the sum of the avoided emissions of the different actors in the value chain of a given solution is not equal to the emissions avoided by the solution.

F. Issue 6

How can an ambitious, achievable and fair target for avoided emissions be established?

Description of the issue

Once the problems linked to the measurement of avoided emissions have been corrected, the monitoring of this metric must be meaningful from the point of view of the fight against climate change, i.e. it must be able to provide information on the company's level of alignment with climate issues. **In other words, it should be a key performance indicator associated with an objective.**

For example, imagine a company that calculates its avoided emissions correctly, with the most appropriate reference scenario, and obtains "30 $ktCO_2e$ avoided in 2020". What can this organization conclude about its contribution to global neutrality? Is this contribution commensurate with the climate emergency? What target should be set for the future in terms of avoided emissions?

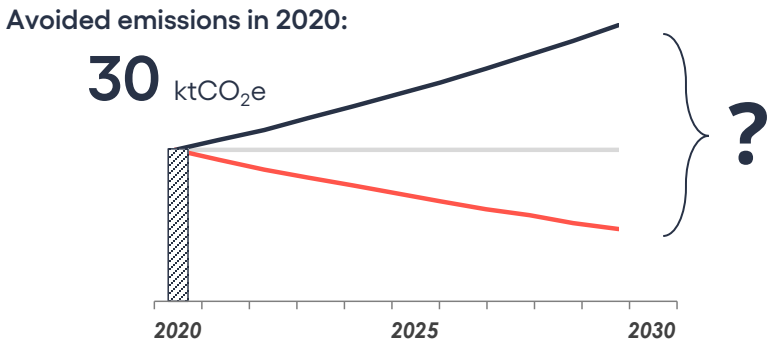


Figure 48 – What should the target be for avoided emissions?

Addressing this issue is essential to make avoided emissions a relevant indicator of the contribution to global neutrality. Also, ensuring that the associated target is science-based involves calculating a total volume of emissions to be avoided compared to a counterfactual forward-looking emissions scenario. This means that **the methodology for setting an avoided emissions target is highly dependent on the methodology used for measuring avoided emissions.**

B2 - Products and services

Outline of options

The Net Zero Initiative's work in 2020 consisted in exploring and investigating the various possible target setting methods. Four methods were identified for avoided emissions from goods and services. They depend on whether a taxonomy is established.

Final choice

In Issue 2, we explained why the Net Zero Initiative rejected the idea of establishing a taxonomy of emission-avoiding products and services. This led to the approach chosen: **a methodology with tCO_2e avoided as the unit of measurement and no taxonomy.**

The target setting method depends on the method used to measure avoided emissions, in particular the choice of the reference scenario, so that this performance indicator reflects as closely as possible the context in which the products or services sold by the companies take place. These two methods must therefore be developed together.

Therefore, the Net Zero Initiative does not provide recommendations on setting avoided emissions targets at this stage. This will be the subject of work in 2021, when **methodologies for measuring and setting targets on avoided emissions will be developed by sector of activity.**

B3 - Financing of avoidance projects outside the value chain

Given the choice of metric for measuring a company's contribution to decarbonation outside its value chain (see Issue 2 above), what is the right way to **set a target for the amount of contribution to be made?**

Outline of options

For each of the two metrics selected in Issue 2 (emissions avoided, amount of funding), it is possible to approach the subject in two different ways:

- The "bottom-up" approach consists in setting this objective as a function of the company's own performance, without any link to a more global scenario;
- The "top-down" approach consists in setting this target in relation to a global emissions reduction scenario, via an allocation key.

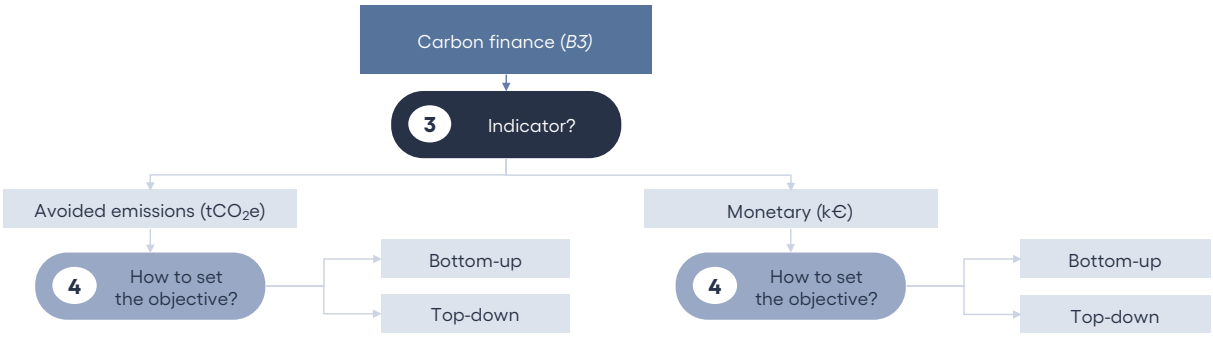


Figure 49 – Possible alternatives for target setting in category B3

In practical terms, these two approaches would look like the following for each metric:

1. "Tons avoided (tCO_2e)" metric:
Option 1.1: Bottom-up

The "bottom-up" approach would be the **classic offset approach**, i.e.:

- "The company must buy as many credits as it emits each year", or
- "The company must buy as many credits as it has issued in its history".

Thus, the amount of tons to be avoided in B3 would be defined according to the emissions in Pillar A (corrected for what is already purchased in C3 - Financing of sinks outside the value chain). Note that this is one of the options currently being considered by the Science-based Targets Initiative (SBTi) in its consultation on corporate net zero[9].

[9] Science-based Targets Initiative (2021), *Foundations for net-zero target-setting in the corporate sector.*

Option 1.2: Top-down

The "top-down" approach would be to **define the company's fair share in terms of tons to be avoided, given the global need to purchase credits.**
The question would then be how to estimate this "global credit purchase requirement", and then to know which criteria should be used to allocate it to each company.

2. "Financial amount (k€)" metric:
Option 2.1: Bottom-up

If the company's action in terms of decarbonation outside its value chain is quantified by the amount of financing, the bottom-up approach would consist in dimensioning an amount to be committed taking into account the company's own emissions (Pillar A). This would correspond to the "Climate Responsibility" approach supported by the NewClimate Institute[10], which consists in setting an internal carbon price compatible with the Paris Agreement, and then converting the company's emissions (Pillar A) into an amount to be committed to climate projects outside the value chain (see steps 3 and 4 in the diagram below).

Figure 50 - How the NewClimate Institute's Climate Responsibility Approach works

This amount is to be invested in all types of carbon projects outside the value chain (B3 + C3): what remains to be done is to convert it into an amount specific to avoidance projects (B3 alone). To do this, it would be sufficient **to subtract the amount of any off-chain sinks financed by the company (C3) from the total amount, in order to isolate only the amount relating to B3.**

[10] https://newclimate.org/climateresponsibility.

Option 2.2: Top-down

This fourth and final option for setting the B3 target would be to **allocate to the company an amount corresponding to its "fair share" in the overall carbon finance effort.**
It then necessary to identify this "total amount of finance" required, and afterwards determine a rule for allocating this amount to a particular company.

Final choice

For the time being, the Net Zero Initiative has decided **to suspend judgment** on how to set the target on B3.
However, it seems difficult to consider a top-down option (1.2 and 2.2), as its calculation seems excessively complex at first sight.

Option 2.1, which aims to scale a financing amount according to the company's emissions and a carbon price compatible with the Paris Agreement (NewClimate), seems attractive from several points of view.

This issue will be addressed more specifically in the 2021 edition of the Net Zero Initiative.

3. Methodological discussions on Pillar C

In the course of the work on Pillar C, the following issues were addressed:

1. Question of the approach: bottom-up (the amount of sinks depends only on the company's emissions) versus top-down (the amount of sinks is set by an allocation of the collective effort to develop sinks to each company).
    - If a bottom-up approach is adopted:
        - what rule should be set?
        - to which scope of emissions should the rule apply?
        - should there be "safeguards" to ensure a minimum amount?
    - If a top-down approach is adopted:
        - what scenario should be chosen to dimension the "cake size" of sinks to be developed globally (and distributed)?
        - what allocation key should be adopted to distribute the effort to each company?
    - Finally, when setting a well development target, is it better to adopt a "bottom-up" or a "top-down" approach?

2. Should a specific target be set for removals in the value chain (C1, C2) in addition to the overall target for the whole of Pillar C?

3. Should a target be set for the type of sink (natural vs technological, or short-term storage vs long-term storage)?

1. Discussion on the approach: bottom-up versus top-down

A. Discussion on the possibility of a bottom-up approach

The Technical Working Group was asked about the relevance of a bottom-up approach. In the event that such an approach is chosen, the experts were asked which rule would be best to apply.

- The "clean your own mess" approach, i.e. the absorption of **all historical emissions of the company,** was considered. This approach can be described as "integral" or "in stock", as all Pillar A emissions since the company's inception are summed to determine the target for C.
- The approach of considering that the target for C should be equal to the residual emissions from A was also considered.

Regarding the scope of emissions considered, the majority of experts were in favor of including all the scopes (1+2+3), although the problems of double counting and shared responsibility were raised.

Finally, the need for socio-environmental safeguards was mentioned, as well as the fact that any recourse to non-permanent sequestration solutions (essentially natural) must take into account the possibility of de-stocking in the atmosphere and must therefore have a "back-up mechanism" to deal with this eventuality.

B. Discussion on the possibility of a "top-down" approach

The top-down approach consists in distributing the collective effort to develop sinks to companies via a distribution key to be defined. The Technical Working Group was asked about the relevance of such an approach, if it were to be chosen.

Choice of scenario for the global removal trajectory
The first question concerned the estimation of the volume of sinks to be developed on a global scale in order to meet the 1.5°C/2°C scenarios.

The IPCC proposes more than 40 theoretical scenarios for emissions and storage that would make it possible to limit global warming to 1.5°C. From one scenario to another, the carbon storage needs by sinks vary by a factor of 10, from 100 to 1000 $GtCO_2$.

Should only one scenario be selected, or a shortlist of scenarios? What criteria should be used to distinguish eligible scenarios?
The question also arises at other territorial scales.
No consensus has really emerged. Even if the experts generally put forward the SR15 P2 scenario, some advised to stick to the "most pessimistic" scenario. Others warned that the IPCC scenarios could not be used as a basis for reflection, and that scenario P1 should not be considered as plausible. Still others argued that any use of negative emission technologies (NETs) should be discouraged.

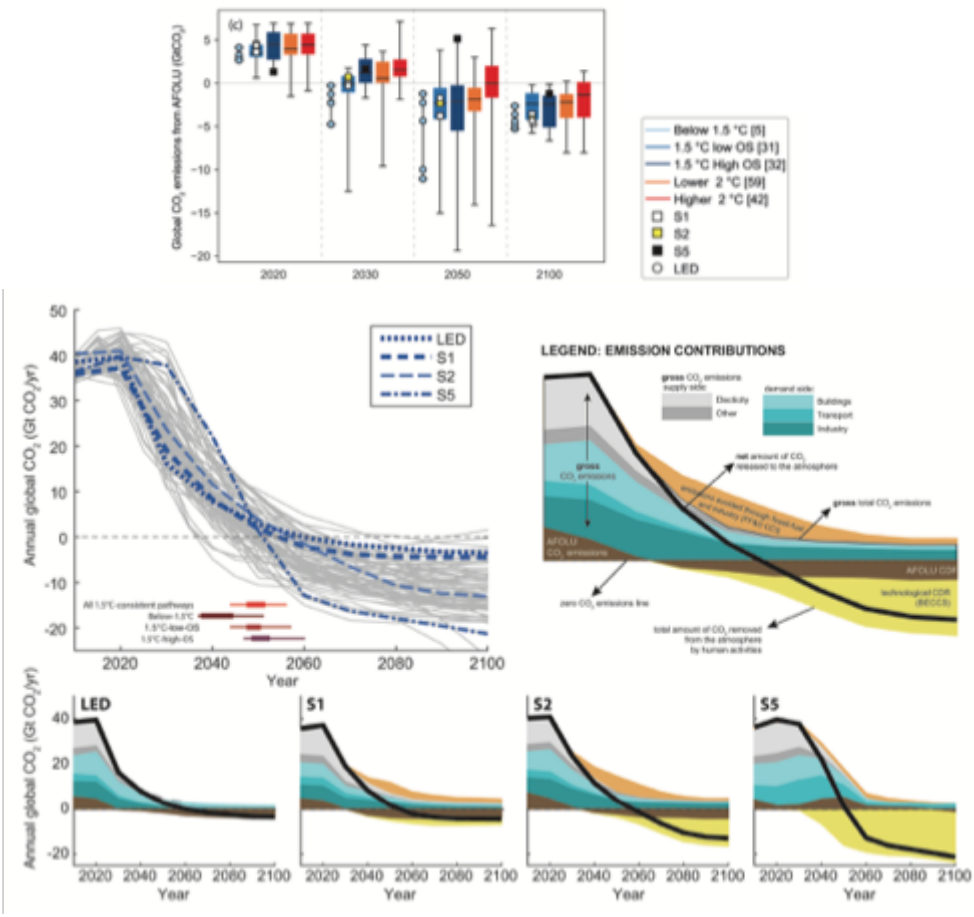


Figure 51 - The IPCC SR15 report (pages 127 and 131) highlights a plethora of scenarios, all compatible with the 1.5°C target, but involving very different amounts of carbon sinks

Choice of allocation key for distributing the volume of sinks to companies
Different choices were put on the table and included the following questions:

- Should 100% of the overall development effort for sinks be allocated to companies alone or not? It may indeed seem wise to divide the effort of convergence towards global carbon neutrality between companies, public authorities and individuals.

- Should we first allocate a development effort to each emitting sector of the economy, or directly to each company, independently of its sector? If so, which distribution key should be chosen to allocate to which sector?

- Which distribution key should be adopted to distribute to a particular company?
    - Should it be relative to the company's share of emissions ("responsibility" approach)? If so, how can this "share of emissions" be estimated?
        - In a **historical approach** (accumulation of all the company's emissions in relation to those of its sector, or even of a given territory)?
        - In an **instantaneous approach** (share of the company's current emissions in relation to those of its sector, or even of a given territory)?
        - Should it be proportional to the **company's profits**, i.e. its added value in relation to global, national or sectoral GDP ("capacity to pay" approach)?

These questions have given rise to profound debates. Excellent arguments have been put forward for all three questions.

C. Should a bottom-up or top-down approach be promoted in the end?

Description of the issues

A summary of the arguments for and against these options is given below:

Bottom-up approaches:

- were favored for their **simplicity**, and their ability to trigger **immediate** action by companies (this calls for the right tools to be put in place to promote transparency and monitoring);
- are considered more likely to attract small and medium-sized enterprises;
- are those that are currently applied "without thinking" by companies;
- have historically been more likely to create traction than top-down approaches.

On the other hand:

- they resemble the classic offset approach too closely, since they require balancing a negative externality of the company (its emissions) with a positive externality (its removals). Although Pillars A and C are strictly separated (an action on C does not justify inaction on A), this can lead to confusion;
- There is no reason a priori why aggregating the bottom-up objectives of companies should result in a total that is consistent with climate science, which is at odds with the NZI's "contribution to global neutrality" approach. Such a method should not accentuate the risk of leading to insufficient overall contributions or, on the contrary, excessive contributions (leading to an over-subscription of natural sinks and technological solutions).

Top-down approaches:

- seem to ensure the greatest consistency with the imperatives of climate science;
- appear to be most in harmony with the NZI's 'contribution' approach.

On the other hand:

- they do not appear to be suitable for small businesses;
- they could slow down the movement of voluntary companies, because of the added complexity of a bottom-up approach
- the choices of allocation (and therefore of effort sharing) are at least as political as scientific and are based on speculative hypotheses that may give rise to controversy;
- the quantity of sinks to be developed evolves according to the speed at which the world is being decarbonized, and therefore requires regular updating of the macro objectives for the development of the sinks at the origin of the allocation;
- they can be seen as a "false good idea for engineers", as they are theoretically attractive (adjustment of macro sequestration objectives into objectives by country or by sector, then by sub-sector and finally by company) but difficult to implement.

Approach adopted

It seemed **useful to adopt a "top-down" approach for the method**, in order to ensure that companies' objectives would allow for the development of sinks in line with global needs (neither too much nor too little), but at the same time ensure that this approach is easy to use, so it can be easily appropriated by all types of company.

The Net Zero Initiative is now leaning towards a rule for the Pillar C target that is linked both to **macro scenarios for the development of carbon sinks** (to match as closely as possible the need for carbon sequestration in a given territory, as recommended by climate science and public policies) and to the company's own climate performance (so that the effort expected of the company is proportional to its responsibility for climate change).

A removals/emissions ratio is calculated from the territorial trajectories of induced and negative emissions (see section "The Net Zero Initiative's recommendations"). It is then used to calculate the development trajectory of the company's carbon sinks based on its projected emissions trajectory aligned with a 1.5 or 2°C scenario.

This encourages companies to be ambitious in their emission reduction trajectories, as a company that adopts a proactive decarbonation trajectory will see its carbon sink development effort lighten proportionally.

This approach differs from the usual "carbon offset" (Pillar A - Pillar C = 0) since no notion of subtraction is introduced, and the calculation of the right level of removals is dependent on a collective macro scenario (national or global). It is also easy for companies to implement.

2. Discussion on adding a specific removals objective to the value chain

Description of the issue

Once the question of the target to be allocated to companies for their overall Pillar C had been addressed, the question was whether it was relevant to add a specific target for the part of the Pillar C corresponding to sinks within the value chain, i.e. categories C1 and C2.

Indeed, for companies in the land, carbon capture and storage technology sector (as well as for all companies in the value chain), their "fair share" is not so much related to their responsibility as emitters as to their status as economic actors within the removals sector.

Thus, for these companies, a requirement that focuses solely on their responsibility as issuers risks underestimating the effort they must make. The question then arose as to whether it would be appropriate to add a second objective specific to C1 and C2 to objective C.

Approach adopted

The idea was welcomed by the TWG, as it highlights the important role of the land sector in developing global carbon sinks. Certainly, this sector must contribute to global carbon neutrality not only as an emitter of GHGs, but also (or even more importantly) as a sector in direct contact with carbon sinks, i.e. as an operator of sequestration itself.
This removals sector can be segmented into sub-sectors according to the nature of the sinks concerned (agricultural, forestry, technological, etc.). This subdivision may be relevant when the climate roadmaps of territories are based on similar distinctions between the contributions made by the different types of sinks.

Discussion on the possibility of specific sub-targets for each type of sink

Description of the issue

The question was whether the NZI method should be prescriptive regarding the nature of the carbon sinks to be used (forests, soils, technologies, etc.) to achieve the objectives. The first option would have been to distinguish sub-targets by type of sink, while the second would have been to let companies decide which types of sink they wanted to use.

For the TWG members, the option of a sub-target for each type of sink had the advantage of:

- being more in line with the IPCC scenarios, which do propose a breakdown by type of sink;

- inviting companies not to leave any type of sink in the blind spot of their action, especially the least technologically mature or most expensive options;
- ensure transparency on the nature of the sinks developed.

On the other hand, it had the disadvantage of:
- making the process more cumbersome;
- not leaving enough freedom to companies;
- making something prescriptive that is likely to happen "naturally" as long as the monitoring tools distinguish between different types of sink.

Furthermore, it was noted that:
- If such a distinction were to be made, the correct duality would not be "natural versus technological", but rather "short term storage / long term storage", regardless of the nature of the sink. Companies should be encouraged to capture and store CO_2 in permanent, geologically stable reservoirs rather than in vulnerable ecosystems.
- Rather than selecting specific technologies, it would be sufficient to establish safeguards that take into account the ecosystem and impermanence risks of each option, and require companies to be transparent about the nature of the sinks developed.

Approach taken

It was decided that adding sub-targets for each type of sink (both in terms of their nature and degree of permanence) would make the recommendations significantly more cumbersome. The Net Zero Initiative is currently recommending that organizations develop the amount of sinks required for their Pillar C without prescribing the type of sinks, but that they should be transparent about the nature and performance of the sinks being sought, following a taxonomy that may be inspired by the work of Oxford University on carbon offsets[11]:

[11] Eli Mitchell-Larson et *al.*, *The Oxford Principles for Net Zero Aligned Carbon Offsetting*, 2020. https://www.smithschool.ox.ac.uk/publications/reports/Oxford-Offsetting-Principles-2020.pdf.

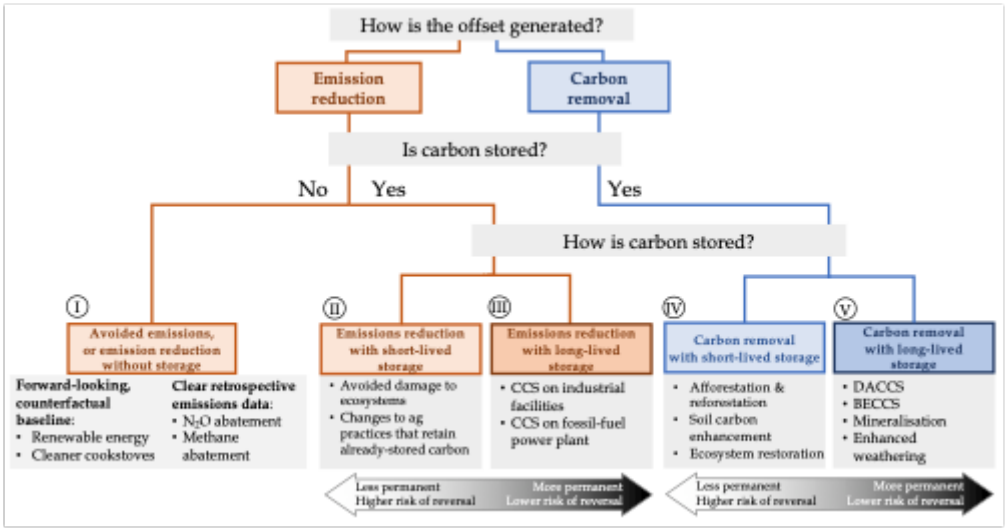


Figure 52 - From the Oxford Offsetting Principles. NZI recommends that companies should be transparent about the nature of the sinks they are applying for and that they should be clearly specified, whether Category IV (carbon removal with short-lived storage) or V (carbon removal with long-lived storage)

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