# “Driving $CO_2$-neutral” is impossible.

Complaint to the *Reclame Code Commissie* against Shell’s misleading promotion of forest-based “compensation” for its fossil $CO_2$-pollution in the Netherlands.

Shell promotes a product that does not, and cannot, do what it promises. Shell thereby violates the *Nederlandse Reclame Code*.

# The inconvenient truth of carbon offsets

**Kevin Anderson** *explains why he refused to purchase a carbon offset, and why you should steer clear of them too.*

Planet Under Pressure was a major conference on the environment held in London last week. As a climate-change scientist, I was invited to organize a session at it and to present my group's research. I declined the offer, and here is why.

The organizers of the conference said that the event would be "as close to carbon neutral as possible". There are good ways to achieve this noble goal: virtual engagement such as video conferencing, advice on lower-carbon travel options, and innovative registration tariffs to reward lower-carbon involvement. But, instead, the organizers chose a series of carbon-offset projects financed through a compulsory £35 (US$56) fee levied on all delegates.

This was unacceptable to me. Offsetting is worse than doing nothing. It is without scientific legitimacy, is dangerously misleading and almost certainly contributes to a net increase in the absolute rate of global emissions growth.

It is true that the projects funded through these and other offsets can help development. And a rise in emissions from industrializing nations is, in the short term, a good indicator of rising prosperity and should be welcomed.

My objection to offsetting and the Clean Development Mechanism (CDM) — the state-sanctioned version that operates under the Kyoto Protocol — is directed at the claims that they reduce emissions to levels at or below those that would have transpired had the activity being offset not occurred. That spurious argument neglects the various possible impacts of an offset and the repercussions of these for emissions in the longer term.

The science underpinning climate change makes clear that the temperature rise by around the end of this century will relate to the total emissions of long-lived greenhouse gases between 2000 and 2100. Consequently, when considering our impact, we have to look at the total sum of our emissions released in that time; offset projects must

**CARBON OFFSETTING IS WITHOUT SCIENTIFIC LEGITIMACY AND IS DANGEROUSLY MISLEADING.**

The promise of offsetting triggers a rebound away from meaningful mitigation and towards the development of further high-carbon infrastructures. The UK government's purchase of offsets through the CDM and its simultaneous drive towards both additional airport capacity and the exploitation of UK shale-gas reserves are just two such examples. If offsetting is deemed to have equivalence with mitigation, the incentive to move to lower-carbon technologies, behaviours and practices is reduced accordingly.

Offsetting, on all scales, weakens present-day drivers for change and reduces innovation towards a lower-carbon future. It militates against market signals to improve low-carbon travel and video-conference technologies, while encouraging investment in capital-intensive airports and new aircraft, along with roads, ports and fossil-fuel power stations.

For an offset project to be genuinely low-carbon, it must guarantee that it does not stimulate further emissions over the subsequent century. Although standards and legislation around offsetting and the CDM sometimes consider 'carbon leakage' in the projects' early years, it is impossible to quantify with any meaningful level of certainty over the timeframes that matter. To do so would presume powers of prediction that could have foreseen the Internet and low-cost airlines following from Marconi's 1901 telegraph and the Wright brothers' 1903 maiden flight.

Assume I broke my (self-imposed) seven-year refusal to fly, paid my £35 offset and boarded a plane from Manchester to London for the conference. In doing so, I add to the already severe congestion at airports, causing delays and allowing politicians to argue for greater airport capacity, arguments only reinforced by the rise in passengers turning to offsets. To meet increasing demand, airlines are encouraged to order new aircraft, which they promise will be more efficient. Feeling pressure, a future government approves new runways, but the extra

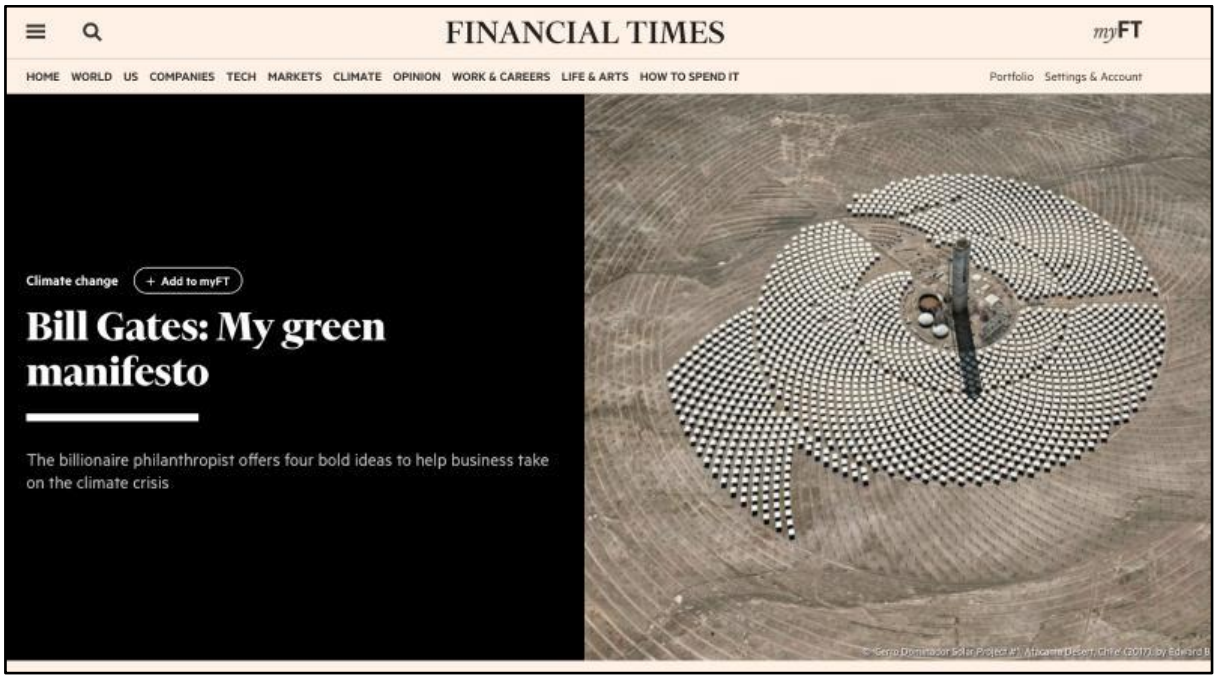
*Already a decade ago, climate scientist Kevin Anderson warned in a comment for the leading science journal Nature that "offsetting" is a "dangerously misleading" concept.*[1]

> "But most of all, regular, non celebrity people were called upon to exercise their consumer power—not by shopping less but by discovering new and exciting ways to consume more. And if guilt set in, well, we could click on the handy carbon calculators on any one of dozens of green sites and purchase an offset, and our sins would instantly be erased."

*The well-known author Naomi Klein criticizes the greenwashing effect of offsetting schemes in her book "This Changes Everything: Capitalism vs the Climate" .*[2]

[1] Kevin Anderson, 'The inconvenient truth about carbon offsets' (2012) 484 *Nature* 7.

[2] Naomi Klein, *This Changes Everything: Capitalism vs the Climate'* (1st edn. Simon & Schuster 2015)




> Planting trees, for instance. It sounds like a simple fix and it has obvious appeal for all of us who love trees, but its impact on climate change is overblown. Although trees absorb some carbon, they can never take in enough to offset the damage from our modern lifestyle. To absorb the lifetime emissions that will be produced by every American alive today — just 4 per cent of the global population — you'd need to plant and permanently maintain trees on more than 16bn acres, roughly half the landmass of the world.

*Only a few weeks ago, billionaire Bill Gates warned in the Financial Times that trees "can never take in enough [carbon] to offset the damage from our modern lifestyle."*[3]

> "Offsets themselves are doing damage," said Larry Lohmann, who has spent 20 years studying carbon credits. While we're sitting here counting carbon and moving it around, more $CO_2$ keeps accumulating in the atmosphere, he said.

*After spending 20 years researching carbon credits, Larry Lohmann sees very little in carbon offsetting: the projects have never fulfilled the promises they make.*[4]

[3] Bill Gates, 'My green manifesto' *Financial Times* (19 February 2021) <https://www.ft.com/content/c11bb885-1274-4677-ba05-fcbac67dc808> accessed 4 March 2021.
[4] L. Song, 'An (Even More) Inconvenient Truth: Why Carbon Credits for Forest Preservation May Be Worse Than Nothing' *Propublica* (22 May 2019) <https://features.propublica.org/brazil-carbon-offsets/inconvenient-truth-carbon-credits-dont-work-deforestation-redd-acre-cambodia/> accessed 6 April 2021.

# Table of Contents

# A. Overview

## A.0 The parties of the complaint

This complaint is submitted by:

- […]
- […]
- […]
- […]
- […]
- […]
- […]
- […]
- […]

- **Reclame Fossielvrij**
- **Greenpeace Netherlands**

This complaint is directed against **Shell**, whose headquarters are situated on:
Carel van Bylandtlaan 16, 2596 HR The Hague, The Netherlands.
(Postal address: PO box 162, 2501 AN The Hague, The Netherlands.)

The advertisement against which this complaint is directed is Shell's **"Rij $CO_2$-neutraal"** (or "Drive $CO_2$ neutral") **campaign**; More specifically, against the promotion of the product "$CO_2$ compensation" which is sold in conjunction with fuel at Shell's gas stations. Shell promotes the product "$CO_2$ compensation", inter alia, at its gas stations and on its website.

## A.1. Summary of the complaint

In numerous campaigns and advertisements in the Netherlands, **Shell promotes the possibility of "compensating", "offsetting" or "neutralizing" the harm caused by the $CO_2$-pollution from Shell's fossil fuel products.** The promotional campaign that stands out the most is "Maak het verschil. Rij $CO_2$-neutraal" ("Make the difference. Drive $CO_2$-neutral") which promotes the product "$CO_2$ compensation." By paying a mere 1 cent per litre, drivers can allegedly "neutralize" the harm caused by the $CO_2$-pollution from their consumption of Shell fossil fuel.

The mechanism promoted by Shell for neutralizing $CO_2$ emissions are so-called "voluntary carbon credits" issued by private operators of projects allegedly protecting forests. It is suggested that payment for such "voluntary carbon credits" would "neutralize" the harm caused by the $CO_2$-pollution from using Shell's fossil fuel products. This is not true: It is **scientifically certain** that the production and use of **fossil fuel products releases a measurable amount of $CO_2$-pollution** that permanently enters the planet's carbon cycle, and thereby harms the climate.[5] By contrast, **the activities promoted as "compensation" do not physically remove any additional amount of $CO_2$** from the carbon cycle, and certainly do not do so in a permanent, measurable, and scientifically certain manner. Consequently, there is **no actual equivalence between $CO_2$-pollution from fossil fuels** and the **activities promoted as allegedly "compensating" this $CO_2$-pollution**: The latter cannot actually "offset" the former in any meaningful sense.

**Shell's promotion of "compensating" $CO_2$-pollution from its fossil fuel products is misleading** consumers because the **promoted mechanisms** do not, and **cannot achieve the promised result of "neutralizing" harmful $CO_2$-pollution from Shell's fossil fuel products.** The consumer is misled about the most important feature of the promoted product. It thereby violates the Dutch Advertisement Code (Nederlandse Reclame Code, NRC) and the Environmental Advertisement Code (Milieu Reclame Code, MRC). **This finding applies to all of Shell's promotional activities on forest-related "$CO_2$ compensation", because the promoted mechanism can never achieve the promised result**.

[5] IPCC, 'Climate Change Synthesis Report' (2014), Summary for Policymakers, 4-5 <https://www.ipcc.ch/report/ar5/syr/> accessed 26 February 2021.

## A.2. Structure of the complaint

**Part A** provides an **overview of this complaint**, of the applicable rules, and of the average consumer model that guides the analysis. Moreover, it provides a brief introduction on the mechanisms that Shell promotes as "$CO_2$ compensation".

**Part B** takes a general approach to the product "$CO_2$ compensation" and its promotion, evaluating the promoted activities from **three distinct points of analysis**: That of climate science, of climate policy, and of climate measurement and accounting. All three perspectives come to the same conclusion, namely that the **mechanisms promoted by Shell do not, and can never achieve the promised result of "compensating", "offsetting" or "neutralizing" the $CO_2$-pollution from Shell's fossil fuel products.** The promotion therefore misleads consumers about the product "$CO_2$ compensation." Additionally, it will be shown that Shell deceptively promotes, by means of nature imagery, the product "$CO_2$ compensation" as an environmentally friendly product. This is misleading because, **by its own logic, the product cannot make a genuinely positive environmental contribution**, as it merely seeks to "neutralize" the climate harm of fossil fuels.

**Part C provides a concrete, in-depth analysis of Shell's campaign** "Maak het verschil. Rij $CO_2$-neutraal" ("Make the difference. Drive $CO_2$-neutral"). It will be shown that this campaign contains numerous misleading claims about "$CO_2$ compensation", which all aim at obscuring the fact that the promoted activities do not, and cannot "neutralize" the harm caused by $CO_2$-pollution from Shell's fossil fuel products. Part C thereby confirms the findings of Part B, and **illustrates the deceptive overall character of Shell's promotion of "$CO_2$ compensation."**

## A.3. The applicable rules

### A.3.1. Applicability of the NRC and the MRC

**Article 1 of the Dutch Advertising Code** (Nederlandse Reclame Code; hereafter: NRC) defines an advertisement as follows:

"*any form of public and/or systematic direct or indirect commendation of goods, services and/or ideas by an advertiser or, either wholly or partly, on behalf of him, with or without the help of a third party. The solicitation of services is also defined as advertising. The advertiser is an organisation or a person, not being a consumer."*

Shell's advertisement campaigns analysed in this complaint promote the product "$CO_2$ compensation." They consequently constitute advertisement in the meaning of Article 1 NRC. Shell is an organisation in the meaning of Article 1 NRC, and not a consumer.

**Article 1 of the Environmental Advertising Code** (Milieu Reclame Code; hereafter: MRC) defines environmental claims as follows:

"*[A]ll advertising which im- or explicitly refers to environmental aspects linked to the production, distribution, consumption or waste processing of goods or services (together referred to as: products).*"

Shell's advertising campaigns analysed in this complaint explicitly refer to the "compensation" of Shell's $CO_2$-pollution. Therefore, Shell's advertising campaign contains environmental claims within the meaning of Article 1 of the MRC.

Consequently, both the NRC and the MRC apply to the contested advertising statements of Shell.

### A.3.2. Substantive provisions

Shell's promotion of the product "$CO_2$ compensation" violate the following provisions:

**Article 8.2 (a and b) NRC** (emphasis added): *"All advertising including incorrect information, or information that is unclear or ambiguous for the average consumer in respect of one or more elements as listed in points a to g hereunder, and which would consequently entice or may entice the average consumer to make a decision on a transaction which he would otherwise not have made, is considered to be misleading:*
*a. The **existence or the nature of the product**;*
*b. The **most important features of the product**, such as availability, advantages, risks, design, composition, accessories, service and complaint handling, process and date of production or execution, delivery, suitability for use, quantity, specification, geographic or commercial origin, results to be expected, or the results and essential features of tests and controls performed."*

**Article 8.3 (c) NRC** (emphasis added): *"Advertising is also regarded as misleading if it entices or may entice the average consumer to make a decision on a transaction he would not otherwise have made. Misleading advertising includes:*
*c. **Omitting essential information**, keeping information concealed, supplying information, in an unclear, incomprehensible, ambiguous way or supplying the information in an untimely fashion.*"

**Article 2 MRC:** "*Environmental claims shall contain no statements, pictures or suggestions that may mislead the consumer concerning environmental aspects of the products recommended or the contribution of the advertiser to maintaining and promoting a clean and safe environment in general.*"

**Article 3 MRC:** "*All environmental claims shall be demonstrably correct. The burden of proof rests with the advertiser. The more absolute the formulation of the claim is the more stringent are the requirements with respect to evidential material*."

**Article 8 MRC**: *"Quotations from, and reference to scientific works shall be representative and verifiably correct. Should the scientific works not be generally accessible, the advertiser shall submit such works on request when a complaint is handled."*

**Article 11 MRC**: *"Advertising messages shall not set as an example environmentally unfriendly behaviour that is avoidable, nor shall such behaviour be encouraged."*

## A.4. "$CO_2$ compensation" and the average consumer

### A.4.1. The target audience of Shell's campaign

The starting point for the assessment of an advertisement is **how the expression is perceived by the average consumer**. According to the Reclame Code Commissie, the average consumer is the **average member of the group to which the expression is addressed**.[6]

If, for example, an advertisement has been placed in a trade journal aimed at professionals in the agricultural sector, the average consumer in that case is the average agricultural professional. Consequently, his level of knowledge and interpretation of the advertisement must be the starting point.[7]

Shell's promotion of the product "$CO_2$ compensation" in the form of posters and billboards, radio spots, videos, blog posts, newspaper, and online articles, are placed where **every consumer in the Netherlands can see them.** They are addressed to **all consumers that use or that can be expected to use Shell's product "$CO_2$ compensation" within the Netherlands**. The average consumer targeted by Shell's promotion of "$CO_2$-compensation" can therefore not be assumed to have expert knowledge on the promoted subject. This will be discussed in more detail in the following section.

### A.4.2. The average consumer's level of knowledge on climate change and "$CO_2$ compensation"

First, the average consumer in the Netherlands **may be assumed to know of climate change and its harmful character**. She is further highly likely aware that $CO_2$-pollution from fossil fuel combustion is a main driver of climate change. However, **climate change is a scientifically complex phenomenon that is extraordinarily hard to understand.** This is true even for climate scientists themselves. A recent study holds in this regard: "The scale of the threats [...] is in fact so great that it is difficult to grasp for even well-informed experts."[8] Consequently, the **average consumer cannot be expected to know, or be able to process, advanced scientific or technical information about $CO_2$-pollution and climate change** (e.g., the respective role of forests in the short- and long-term carbon cycle, or the impact of climate change on the carbon uptake potential of forests).

[6] Reclame Code Commissie *OCI Nutramon* (2019) 2019/00780.
[7] Ibid.
[8] Bradshaw et al., 'Underestimating the Challenges of Avoiding a Ghastly Future' (2021) 1 Front. Conserv. Sci. Article 615419.

Second, the **average consumer may be assumed to understand the core idea underlying "$CO_2$ compensation."**[9] However, the specifics of the operation of the promoted "$CO_2$ compensation" mechanisms are extremely complicated, and comprehensible only to the expert.[10] The **average consumer cannot be assumed to know, or be able to process such complex technical and scientific information**. This is confirmed by studies on consumer understanding of "$CO_2$ compensation."[11]

Third, the average consumer may choose to consult Shell's website to learn more about how the promoted activities work. However, as will be shown in Part C of this complaint, **the technical and scientific details provided on Shell's website are fundamentally misleading**. It should be added that the average consumer cannot be expected to do extensive research to check the veracity of every marketing claim they encounter. This has recently been confirmed by the Reclame Code Commissie in the context of a misleading promotion of "renewable" diesel: The average consumer must be assumed to base her decision on the main marketing claim.[12]

### A.4.3. What the average consumer can be assumed to expect from the product "$CO_2$ compensation"

Shell promotes the "compensation", "offsetting" or "neutralisation" of $CO_2$-pollution from fossil fuels. According to the Reclame Code Commissie, the literal text of the advertisement will create certain **expectations among consumers**. These expectations must align with the **reality of the product**.[13]

Not having expert knowledge on the subject, the average consumer can be assumed to expect that **the promoted mechanisms do what Shell explicitly promises they do**. The wording of slogans like "Drive $CO_2$ neutral" ("Rij $CO_2$-neutraal") and "$CO_2$ compensation" ("$CO_2$ compensatie") suggests that payment for the promoted product will neutralise, fix, or "make up for" the harmful effects of $CO_2$-pollution from using Shell's fossil fuel products. The expectation that his or her emissions will be neutralised undoubtedly influences the consumer's decision to purchase the product

[9] Reclame Code Commissie *Shell - "$CO_2$-neutraal rijden"* (2019) 2019/00292.
[10] Carton et al., 'Negative emissions and the long history of carbon removal' (2020) 11 Wire's Climate Change 671.
[11] Cheung et al., 'The awareness and willingness of air travellers to pay for voluntary carbon offsets and their co-benefits' (2015), 15 " *Working Papers* 199231, University of Western Australia, School of Agricultural and Resource Economics; Jin-Long Lu & Chiu-Yi Wang, 'Investigating the impacts of air travellers' environmental knowledge on attitudes toward carbon offsetting and willingness to mitigate the environmental impacts of aviation' (2018) 106, *Transportation Research Part D: Transport and Environment*; Claudia Schwirplies & Andreas Ziegler, 'Offset carbon emissions or pay a price premium for avoiding them? A cross-country analysis of motives for climate protection activities' (2015) 756 *Applied Economics*
[12] Verbied Fossiele Reclame, 'Reclame Code Commissie: Neste mag z'n diesel in advertenties niet 'renewable' noemen' (2021) <https://verbiedfossielereclame.nl/neste-mag-diesel-niet-renewable-noemen-reclame-code-commissie/> accessed 26 February 2021.
[13] Reclame Code Commissie *Vattenfall* (2019) 2019/00656/A.

"$CO_2$ compensation". More specifically, the availability of an offsetting product may induce consumers who want to act as environmentally-friendly as possible to refuel at a Shell station rather than at a competitor that does not offer a $CO_2$ "compensation" product.

It will be shown, however, that **the promoted mechanisms fail to do what Shell promises they do**: They do not, and cannot, neutralize the harm caused by $CO_2$-pollution from Shell's fossil fuel products. The average consumer cannot be expected to know that **the "neutralisation" of $CO_2$-pollution from Shell fossil products is a marketing fantasy that does not, and cannot exist in real life.**

If the consumer had been aware of the precise functioning of the mechanisms of "$CO_2$ compensation" and realised the sheer impossibility of this claim, a different transactional decision would be made. The consumer may not have decided to refuel at a Shell gas station in the first place, given that the alleged compensation mechanism, for which a consumer may initially have been induced to refuel at a Shell station, does not do what it promises. Refuelling at a petrol station which does not offer such a "compensation" scheme then makes no difference compared to refuelling at a Shell station. In the second place, a consumer aware of the dysfunctionality and impossibility of Shell's "$CO_2$ compensation" would have likely not made the transactional decision to "compensate" for his or her emissions upon a fuel purchase at a Shell station.

## A.5. Overview: the mechanisms that Shell promotes as "$CO_2$ compensation"

This section provides a first, brief overview of how the mechanisms that Shell promotes as performing "$CO_2$ compensation" work, and delineates them from other forest-related activities. A more detailed analysis follows in Part B.

The mechanism that Shell promotes as "compensating" for $CO_2$-pollution from fossil fuels is the **(alleged) protection of existing forests (or "avoided deforestation")**. To "compensate" for the $CO_2$-pollution from Shell fossil fuel products, Shell buys "voluntary carbon credits."[14] These are created by so-called REDD-projects. The **REDD-projects are set up with the stated objective to protect existing, intact forests from deforestation** (the acronym "REDD" stands for "Reducing emissions from deforestation and forest degradation").[15] The operator of the REDD-project then issues "voluntary carbon credits" based on the premise that, without the project, the forest would have been deforested ("avoided deforestation"), and carbon "stored" in the forest would have been released into the atmosphere. The **creation and oversight of such "voluntary carbon credits" is not publicly regulated**.[16] Anybody can create and then issue "voluntary carbon credits."[17] While private certification bodies exist, they are not independent, not subject to public supervision, and operate on the basis of vague guidelines rather than strict, auditable rules. The topic of "voluntary carbon credits" will be discussed in more detail in Section B.6.

Another mechanism that allegedly "compensates" for $CO_2$-pollution is the **planting of trees ("afforestation" where it concerns planting new trees and "reforestation" where it concerns replanting destroyed or lost trees).** Such activity is supposed to temporarily lock in carbon once the trees mature some decades into the future, assuming that the forest remains intact for that time period. Shell finances certain tree-planting projects, and promotes them (e.g. in the "Samen planten we bomen" campaign with the Dutch forestry service Staatsbosbeheer). **According to Shell**, **tree-planting activities do not form part of the "$CO_2$ compensation" product** that is promoted by the "Drive $CO_2$-neutral" campaign.[18] This is also confirmed by the self-

[14] Shell, '$CO_2$ neutraal rijden. How werkt $CO_2$ Compansatie?' <https://www.shell.nl/consumenten/$CO_2$-neutraal-rijden/hoe-werkt-$CO_2$-compensatie.html> accessed 26 February 2021.
[15] Shell, 'De Internationale $Co_2$-Compensatieprojecten' <https://www.shell.nl/consumenten/$CO_2$-neutraal-rijden/$CO_2$-compensatie-projecten.html> accessed 1 March 2021.
[16] German Emissions Trading Authority (DEHSt) at the German Environment Agency, 'The Voluntary Carbon Market: What may be Its Future Role and Potential Contributions to Ambition Raising?' (2019) 12 <https://epub.wupperinst.org/frontdoor/deliver/index/docId/7396/file/7396_Carbon_Market.pdf> accessed 1 March 2021.
[17] Lukas Hermwelle et al, 'Identity Crisis? Voluntary Carbon Crediting and the Paris Agreement' (2016) 2 JIKO Policy Brief 3.
[18] Shell, '$CO_2$ neutraal rijden. How werkt $CO_2$ Compansatie?'

reporting of the two REDD-projects that Shell promotes, neither of which claim credits from tree-planting.[19] Consequently, Shell's "$CO_2$ compensation" is exclusively based on hypothetical $CO_2$-removal from "voluntary carbon credits" created by "avoided deforestation" (REDD) projects.[20]

One of the many **misleading aspects** of Shell's promotion of the product "$CO_2$ compensation" is the **constant referral to tree-planting projects, even though the product "$CO_2$ compensation" is based on "voluntary carbon credits" from "avoided deforestation" projects alone**. This will be discussed in more detail in Part C.


*Shell promotes tree-planting and the cooperation with Staatsbosbeheer prominently on its website for the "Drive $CO_2$-neutral" campaign, even though the money consumers pay for the product "$CO_2$ compensation" neither finances tree-planting nor Staatsbosbeheer.*[21]

<https://www.shell.nl/consumenten/$CO_2$-neutraal-rijden/hoe-werkt-$CO_2$-compensatie.html> accessed 26 February 2021.

[19] Katingan Peatland Restoration and Conservation Project, 'Monitoring & Implementation Report'(2019) <https://registry.verra.org/app/projectDetail/VCS/1477> accessed 24 March 2021; Cordillera Azul National Park REDD+ Project, 'Monitoring Report' (2018) 6 <https://registry.verra.org/app/projectDetail/VCS/985> accessed 24 March 2021.

[20] 'Shell plant nauwelijks bomen van je cent $CO_2$-compensatie aan de pomp' *RTLNieuws* (12 April 2019) <https://www.rtlnieuws.nl/economie/bedrijven/artikel/4676266/shell-extra-bomen-$CO_2$-uitstoot-aflaat-niet-planten-maar-niet> accessed 11 March 2021.

[21] Shell, 'Maak het verschil. Rij $CO_2$-neutraal.' <https://www.shell.nl/consumenten/$CO_2$-neutraal-rijden.html> accessed 26 February 2021

Bedrijven

# Shell plant nauwelijks bomen van je cent CO2-compensatie aan de pomp

12 april 2019 18:24
Aangepast: 12 april 2019 20:15

Bosbranden zijn een grote bedreiging voor regenwouden op Indonesië. Er komt ook veel CO2 bij vrij.

**Vanaf volgende week kun je volgens Shell je CO2-uitstoot van het autorijden compenseren. En dat al voor slechts een cent per liter. Maar van die ene cent per liter extra plant Shell alleen nauwelijks extra bomen, blijkt uit een analyse van de projecten waar Shell zogenoemde CO2-credits koopt.**

*Shell's promotion of "$CO_2$ compensation" constantly refers to tree-planting, even though it does not actually form part of the activities associated with the "Drive $CO_2$ neutral" campaign.*[22]

[22] 'Shell plant nauwelijks bomen van je cent $CO_2$-compensatie aan de pomp' *RTLNieuws* (12 April 2019) <https://www.rtlnieuws.nl/economie/bedrijven/artikel/4676266/shell-extra-bomen-$CO_2$-uitstoot-aflaat-niet-planten-maar-niet> accessed 11 March 2021.

## A.6. Past complaints against the "Drive $CO_2$-neutral" campaign: Shell successfully misled the Reclame Code Commissie

In 2019, the Reclame Code Commissie dealt with four complaints against specific advertising messages of Shell's 'Drive $CO_2$ neutral' campaign.[23] In its decisions, the Reclame Code Commissie failed to address the elephant in the room: It **did not seek to ascertain whether the mechanisms that Shell promotes as "$CO_2$ compensation" are actually capable of realizing the promised result.** This complaint shows conclusively that the promoted product does not, and cannot, achieve the promised outcome.

The publicly available case information indicates, moreover, that **Shell has submitted factually incorrect claims to the Reclame Code Commissie** in at least three instances: **First, Shell incorrectly claimed that the promoted REDD-projects are "certified by the UN."**[24] However, neither the UN itself nor any UN sub-body actually certifies REDD-projects.[25] Instead, REDD-projects are merely "verified" by private bodies, without public oversight and without a publicly regulated verification procedure.[26] This is further discussed in section B.6.

**Second, Shell incorrectly claimed that the "voluntary carbon credits" created by the promoted REDD-projects are subject to "audits" by "independent thirds."**[27] As just mentioned, the "verification" process of "voluntary carbon credits" is conducted by private entities, without public oversight and without a binding, public procedure. The verifying entities are paid by the project operators themselves, creating obvious conflicts of interest ("**verification-for-pay**"). Given, moreover, the absence of an effective system of oversight and sanctions in case of malfeasance, **the "verification" process cannot be described as independent** in any meaningful way.

This is further illustrated by the fact that the **private entities engaged in the "verification" process** typically also participate in the creation of the rules on the basis of which REDD-projects are "verified", and frequently even **have direct**

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[23] Reclame Code Commissie *Shell - "$CO_2$-neutraal rijden"* (2019) 2019/00651/A, 2019/00651, 2019/00292, 2019/00292/A.

[24] "Shell werkt daarbij uitsluitend met door de VN gecertificeerde REDD++ [sic] projecten, in dit geval de genoemde projecten in Peru en Indonesië ..."

[25] See Decision 13/CP.19 (Guidelines and procedures for the technical assessment of submissions from Parties on proposed forest reference emission levels and/or forest reference levels) and Decision 14/CP.19 (Modalities for measuring, reporting and verifying), in: UNFCCC, 'Key decisions relevant for reducing emissions from deforestation and forest degradation in developing countries (REDD+)' (2014) <https://unfccc.int/files/land_use_and_climate_change/redd/application/pdf/compilation_redd_decision_booklet_v1.1.pdf> accessed 24 March 2021.

[26] CIFOR, 'Key issues in REDD+ verification' (2013) 14 <https://www.cifor.org/publications/pdf_files/OccPapers/OP-88.pdf> accessed 24 March 2021.

[27] "... de genoemde projecten in Peru en Indonesië, die uitvoerige audits ondergaan en ook Shell laat haar berekeningen door een onafhankelijke derde controleren."

**economic interests** related to the success of REDD-projects, e.g. by co-creating such projects or by advising project creators or buyers of carbon credits.[28] The "verification" of "voluntary carbon credits" is therefore not independent at all, but is **characterized by multiple conflicts of interest**.

Furthermore, the methodologies guiding the creation of "**voluntary carbon credits" are hardly auditable in any objective sense**.[29] The reason is that the emissions that are allegedly avoided are not (and cannot be) measured objectively. Instead, they are "created" in the books by means of a comparison between the actual, existing situation and a hypothetical, imagined alternative development ("what if this project had not been set up?"). This is explained in more detail in section B.6. The approach essentially relies on speculative and hypothetical assumptions, whereas hard, verifiable data is mostly absent.[30] **The "verification" of "voluntary carbon credits" can therefore not be described as a proper audit at all**, at least if compared to "real" auditing conducted, for example, in the context of financial reporting.[31]

**Third, Shell incorrectly claimed that the mechanisms promoted by the "Drive $CO_2$-neutral" campaign include tree-planting**.[32] It has already been shown in section A.5. that this is not the case.

These three instances show that Shell has not only misled consumers, but also **deceived the Reclame Code Commissie**.

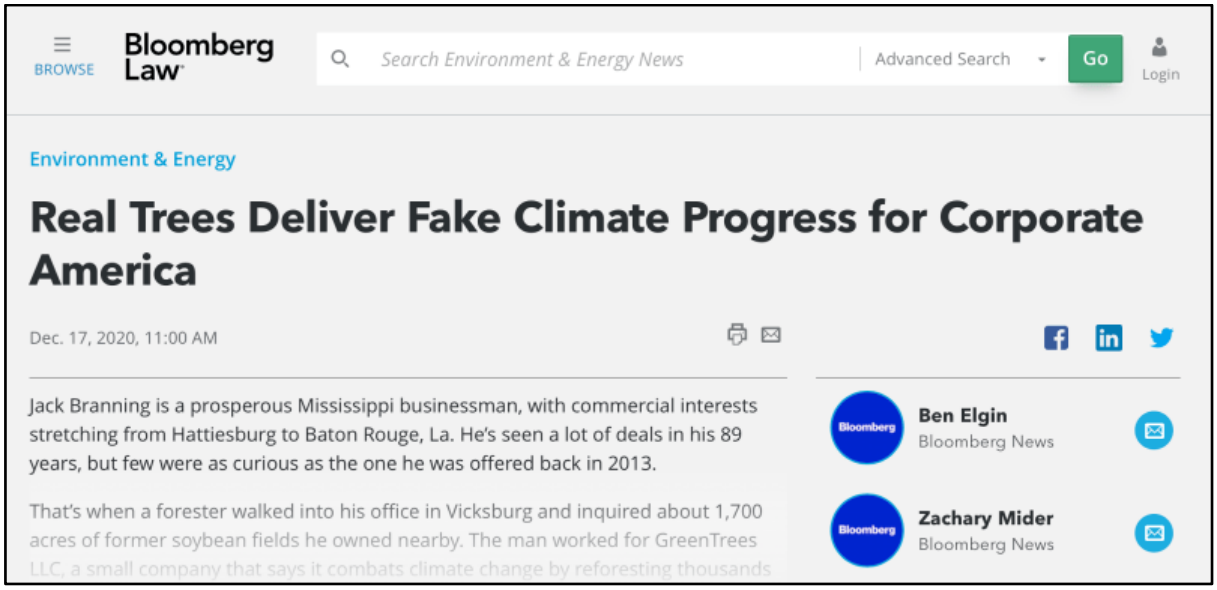
[28] For example, Permian Global is a project partner of the Katingan project, but also co-authored the very methodologies on the basis of which the project was subsequently "verified." Astor Global and SCS Global Services "verified" or "validated" reports for the Katingan project, but also participated in the review of the applied methodology itself. Employees of Climate Focus, which co-wrote the same methodology, sit on the board of Verra (the organization managing the "voluntary carbon credit" system that Shell's REDD-projects use), participate in the development of forest projects and advise buyers of credits, but also author policy reports and academic articles on the subject. See e.g. the disclosure of conflicts of interests in Charlotte Streck et al, 'A close look at the quality of REDD+ carbon credits' (2020) <https://www.climatefocus.com/sites/default/files/A%20close%20look%20at%20the%20quality%20of%20REDD+%20carbon%20credits%20(2020)%20V2.0.pdf> accessed 24 March 2021.

[29] Barbara Haya et al, 'Managing uncertainty in carbon offsets: insights from California's standardized approach' (2020) 20 Climate Policy 1112.

[30] As an illustrative example see Katingan Peatland Restoration and Conservation Project, 'Monitoring & Implementation Report'(2019) <https://registry.verra.org/app/projectDetail/VCS/1477> accessed 24 March 2021.

[31] European Commission, 'Financial reporting' <https://ec.europa.eu/info/business-economy-euro/company-reporting-and-auditing/company-reporting/financial-reporting_en> accessed 24 March 2021.

[32] "Daarbij is gekozen voor een directe koppeling met het tegengaan van ontbossing en het planten van bomen."


*In two damning articles from December 2020,* Bloomberg*, the world's most important financial news service, describes forest-"offsetting" as "meaningless" and "fake climate progress."*[33]

[33] Ben Elgin, 'These Trees Are Not What They Seem. How the Nature Conservancy, the world's biggest environmental group, became a dealer of meaningless carbon offsets.' *Bloomberg* (9 December 2020) <https://www.bloomberg.com/features/2020-nature-conservancy-carbon-offsets-trees/> accessed 17 March 2021; Ben Elgin and Zachary Mider, 'Real Trees Deliver Fake Climate Progress for Corporate America' Bloomberg (17 December 2020) <https://news.bloombergtax.com/environment-and-energy/real-trees-deliver-fake-climate-progress-for-corporate-america> accessed 17 March 2021.

# B. All promotion of the product "$CO_2$ compensation" is misleading, as the product does not, and cannot achieve the promised result

Shell promotes the product "$CO_2$ compensation", which can be bought upon purchasing Shell fuel. **"$CO_2$ compensation"** allegedly "compensates", "offsets" or **"neutralizes" the harm caused by the $CO_2$-pollution from Shell's fossil fuel products**. This is **factually untrue.** As will be shown in this part of the complaint, the promoted mechanisms do not, and cannot do what they promise: Consequently, the promotion of the product "$CO_2$ compensation" **violates Article 8(2)(a) and (b) NRC, misleading about the existence and the nature of the product**, as well as about its **advantages and risks**.

The **mechanisms promoted by Shell do not cause the removal of carbon** from the carbon cycle in a way that **could be considered equivalent to the $CO_2$-pollution from fossil fuels** in any meaningful way. This non-equivalence (or lack of "fungibility") has long been recognized in climate science.[34] This part of the complaint will establish the non-equivalence of $CO_2$-pollution from fossil fuels on the one hand and forest-based "compensation" activities on the other on the basis of six central differences. These differences relate to climate science, to climate policy and to carbon measurement and accounting. They are briefly summarized here, and will be developed in more detail below:

*Climate science*

- **$CO_2$-pollution from fossil fuels enters the carbon cycle permanently**. Once released into the carbon cycle, it causes harm to the climate for thousands of years. **Trees, by contrast, are by their nature impermanent**: Forests can "store" carbon only temporarily. Forest-based "compensation" activities are therefore not equivalent to $CO_2$-pollution from fossil fuels, because they only **offer a temporary "solution" to a problem that is permanent**. (Section B.1.)
- It is scientifically certain that burning fossil fuels creates $CO_2$-pollution that enters the carbon cycle, which harms the climate. By contrast, the capacity of forests to "store" carbon over the coming decades (let alone centuries) is highly uncertain: **Climate change** undermines the very ability of forests to "store" carbon. Whereas **the climate harm from fossil fuels is therefore scientifically certain**, the **possible climate benefits of forest-based "compensation" activities in the coming decades are highly uncertain**. (Section B.2.)

[34] Kate Dooley et al, 'Governing by expertise: the contested politics of (accounting for) land-based mitigation in a new climate agreement' (2017) 17 Int Environ Agreements 483, 489.

*Climate policy*

- The climate harm of $CO_2$-pollution from fossil fuels is unconditional, i.e., it unfolds regardless of the specific circumstances of their release into the atmosphere. By contrast, the realization of the alleged climate benefits from "avoided deforestation" projects (such as the REDD-projects Shell promotes) depends on the fulfilment of a number of conditions, which are difficult to meet in practice. **Shell's "compensation" activities therefore offer a merely conditional "solution" to an unconditional problem**. (Section B.3.)
- Avoiding $CO_2$-pollution altogether is, from a perspective of climate policy, far superior than engaging in "compensation" activities while continuing to emit $CO_2$-pollution. The climate crisis has already advanced so far that, for a chance to reach the Paris objective, emission reductions and the protection of forests must be deployed in conjunction, and not alternatively. Consequently, the product **"$CO_2$ compensation" offers a "solution" to the climate harm caused by fossil fuels that is greatly inferior, and not equivalent to avoiding $CO_2$-pollution altogether**. (Section B.4.)

*Carbon measurement and accounting*

- The **$CO_2$-pollution from fossil fuel combustion can be measured in a direct and precise manner**. By contrast, the **carbon fluxes of forests can be established only in an indirect and highly imprecise manner**, with enormous uncertainties remaining. Claims about the alleged climate benefits of the product "$CO_2$ compensation" are therefore necessarily relying on highly imprecise and uncertain data, whereas the climate harm of fossil fuels can be established in a precise and scientifically certain manner. **"Compensation" therefore offers an essentially unmeasurable "solution" to a measurable problem**. (Section B.5.)
- The combustion of fossil fuels creates actual, physical $CO_2$-pollution that enters the carbon cycle. By contrast, the "voluntary carbon credits" promoted by Shell are attributed to "avoided deforestation" projects, which - by their own logic - **do not physically pull out $CO_2$-pollution from the atmosphere**. Their climate benefits are of a calculatory nature only, existing in the books alone. **Shell's "compensation" projects therefore offer a merely hypothetical "solution" to a real-world problem.** (Section B.6.)

"Compensation" activities on the one hand and $CO_2$-pollution from fossil fuels on the other are therefore not equivalent in terms of climate science, climate policy or carbon measurement and accounting. In the absence of equivalence between the two, it is **misleading to claim that "compensation" activities could "neutralize", "offset" or "compensate" $CO_2$-pollution from fossil fuels**.

It will be shown, additionally, that Shell deceptively promotes "$CO_2$ compensation" by means of images, colours and suggestions that **imply that the product is**

**environmentally friendly**. However, this is **logically impossible**, given that the mere neutralization of a negative effect cannot be considered to be a positive effect, just like the repayment of a debt does not constitute generosity. (Section B.7.)

## B.1. A temporary "solution" to a permanent problem: Forest-based "compensation" is not a viable way to remove $CO_2$-pollution permanently from the carbon cycle

### B.1.1. Introduction

Science unequivocally shows that natural biogeochemical processes, such as uptake by terrestrial ecosystems, may partially "offset" atmospheric $CO_2$-pollution, but the **long-term benefits of forestry projects are largely exaggerated.**[35]

The $CO_2$ uptake of the terrestrial-biosphere (i.e., forests), is part of the so-called short-term carbon cycle. **Forests partially re-release $CO_2$ back into the atmosphere, instead of removing it permanently**. The effects of forests are therefore temporary. By contrast, the burning of fossil fuels permanently adds to existing $CO_2$-pollution levels, disrupting the long-term carbon cycle. Therefore, it is **misleading to suggest that forest-based "offsetting" is a viable, long-term solution for "neutralizing" $CO_2$-pollution**.

The promise made by companies for consumers to drive carbon neutrally is **incompatible with the science** behind carbon offsetting. In order to grasp why this is the case, it is vital to understand the terrestrial carbon exchange, interactions between the biosphere and atmosphere, and assess the real contribution of forests within the global carbon-system.[36]

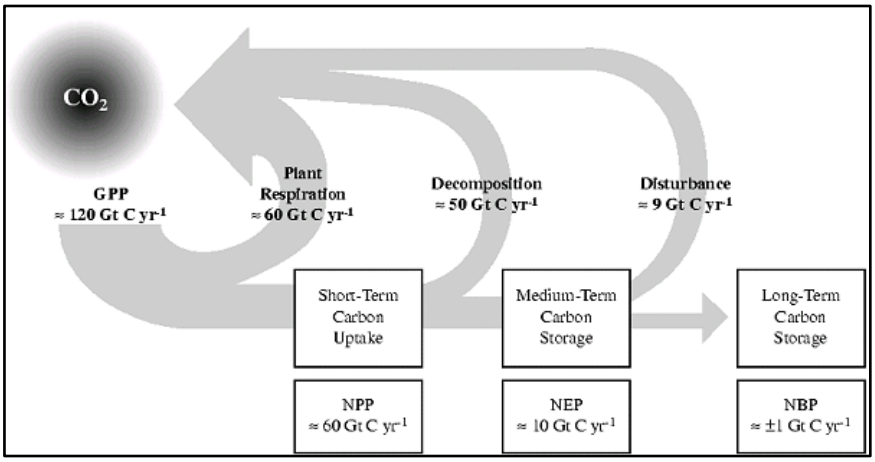
### B.1.2. Forest-based "offsetting" is a temporary solution to a long-term problem

The carbon cycle consists of three systems, distinguished by temporal measure: i) the short term, ii) the medium term, and ii) the long-term carbon cycle. The first and the last are those of interest in this complaint. The **short-term carbon cycle operates over a period of a hundred to a few hundred years, where the so-called carbon sinks (such as forests) temporarily store carbon**. However, that **carbon is ultimately re-released** back into the system. Short-term carbon processes include photosynthesis, respiration, and the surface exchange of $CO_2$ with the oceans. The short-term carbon cycle's primary process is the photosynthesis of green plants. **Different from what is often assumed, the largest contributor is the ocean's surface phytoplankton, not forests.** Tropical forests are an example of a temporary carbon sink, where $CO_2$-pollution is "recycled" between the atmosphere and land

[35] Chris Huntingford and Rebecca Oliver, 'Converging towards a common representation of large-scale photosynthesis' (2020) 27 *Global Change Biology* 716.

[36] Pierre Friedlingstein, Malte Meinshausen, Vivek K. Arora, Chris D. Jones, Alessandro Anav, Spencer K. Liddicoat & Reto Knutti, 'Uncertainties in CMIP5 climate projections due to carbon cycle feedbacks' (2014) 27 *Journal of Climate* 511.

through photosynthesis and respiration. Land-atmosphere exchange of $CO_2$ is dynamic, and exhibits marked seasonal and inter-annual variations, which can affect the overall strength of the carbon sink in both the short- and long-term.[37]




*Global terrestrial carbon uptake and storage.*[38]

By contrast, **the only substantial carbon sinks operate in the long-term carbon cycle, of which forests are not part of**. Only then is $CO_2$ removed from the carbon cycle in a way that is relevant to preventing global warming, as seen in the graphic above. The figure further illustrates that most of the $CO_2$ uptake from plants will end up re-entering the atmosphere. This long-term cycle operates over thousands to hundreds of thousands of years. It primarily includes the process of organic carbon from dead organisms to pressurize over time to form solid carbon. This solid carbon on land takes the form of fossil carbons - coal, oil, and gas. In the ocean, it takes the form of rock - limestone and dolomite. The oceanic process starts with phytoplankton, which absorbs atmospheric $CO_2$. Most atmospheric $CO_2$ gets absorbed in this way. In the ocean food chain, shell-forming organisms transform the carbon to calcium carbonate. Calcium-based rock - limestone and dolomite, forms through the long pressurization processes in the ocean floor sediment.[39] Therefore, **permanent removal of carbon from the Earth's carbon system takes thousands of years**.

It is crucial to understand the **problematic 'quick-fix'** of companies like Shell whose profitable activities consist of marketing oil and natural gas which has taken hundreds of thousands of years to produce within the long-term carbon-cycle. Essentially, this **$CO_2$-pollution, which otherwise would have remained in the ground, is now**

[37] Karen Hei-Laan Yeung, Carole Helfter, Neil Mullinger, Mhairi Coyle & Eiko Nemitz, 'From sink to source: long-term (2002-2019) trends and anomalies in net ecosystem exchange of $CO_2$ from a Scottish temperate peatland' (2020) EGU General Assembly Conference Abstracts, Provided by the SAO/NASA Astrophysics Data System, 5697.

[38] IGBP Terrestrial Carbon Working Group, 'The Terrestrial Carbon Cycle: Implications for the Kyoto Protocol' (2008) 280 *Science*, 1393.

[39] Michael A. Arthur, 'The Carbon Cycle—Controls on Atmospheric $CO_2$ and Climate in the Geologic Past' (1982) in National Research Council, *Climate in Earth History* (The National Academies Press, Washington, DC 1982) 55.

**introduced into the Earth's carbon system**. This $CO_2$ pollution will remain harmful to the environment until it has been permanently removed from the system. A company that is involved in the introduction of large amounts of carbon into the global carbon budget, which results in carbon fluxes that alter the entire system, now proposes to "offset" their negative actions, with forest "offsetting" projects. These projects operate in the short-term and do not permanently remove the $CO_2$-pollution from the carbon cycle, but rather, circulate it through an assortment of biological processes. In this way, **the company introduces a short-term tool to try and solve a long-term problem, a problem that they helped create in the first place**.

### B.1.3. Trees lock-in $CO_2$ when growing biomass, but more than half of that $CO_2$ is re-released into the atmosphere by respiration and other processes.

Biological processes, such as respiration and metabolism, limit the total net biome-production (NBP) of trees, which balances out their carbon uptake and lessens their projected role as a significant carbon-sink. After examining the fundamental processes of the two carbon cycles in the previous sub-section, **we turn to the role of trees**, the subject of companies' advertised "offsetting" projects, and their role in the short-term carbon cycle. The first step of carbon intake in trees is photosynthesis, where plants use the energy from sunlight to transform atmospheric carbon dioxide into organic molecules (gross primary production (GPP)). These molecules are the building blocks for plant growth and the basic material to maintain basic functions as roughly half of the dry biomass of plants is made up of carbon molecules. Through the accumulation of biomass, **carbon becomes locked in, but this process only begins after approximately 20 years**. A part of this biomass is allocated to the long-lived stem, branches, and coarse roots; the remaining carbon is net primary production (NPP). **A significant portion of the carbon does not get locked-in, but rather, is returned to the atmosphere through vegetational respiration**. Respiration is the basic cellular process to obtain chemical energy from the oxidation of organic molecules, and $CO_2$ is the resulting waste product of this metabolism. **Typically, around half of the total captured carbon by trees is eventually released through respiration.** Afforestation projects can make seemingly convincing arguments because it is rather difficult coming up with arguments why *not* to plant more trees. When data is framed in a way that states the amount of $CO_2$ that is drawn in by trees, 752 Gt of $CO_2$, the fact that around half of that $CO_2$ will eventually end up in the atmosphere, is omitted.[40] In other words, of 752 Gt of $CO_2$ drawn in by trees, approximately 376 Gt are re-released into the atmosphere by respiration alone. This is crucial information to evaluate the potential and limits of forest-based "offsetting".

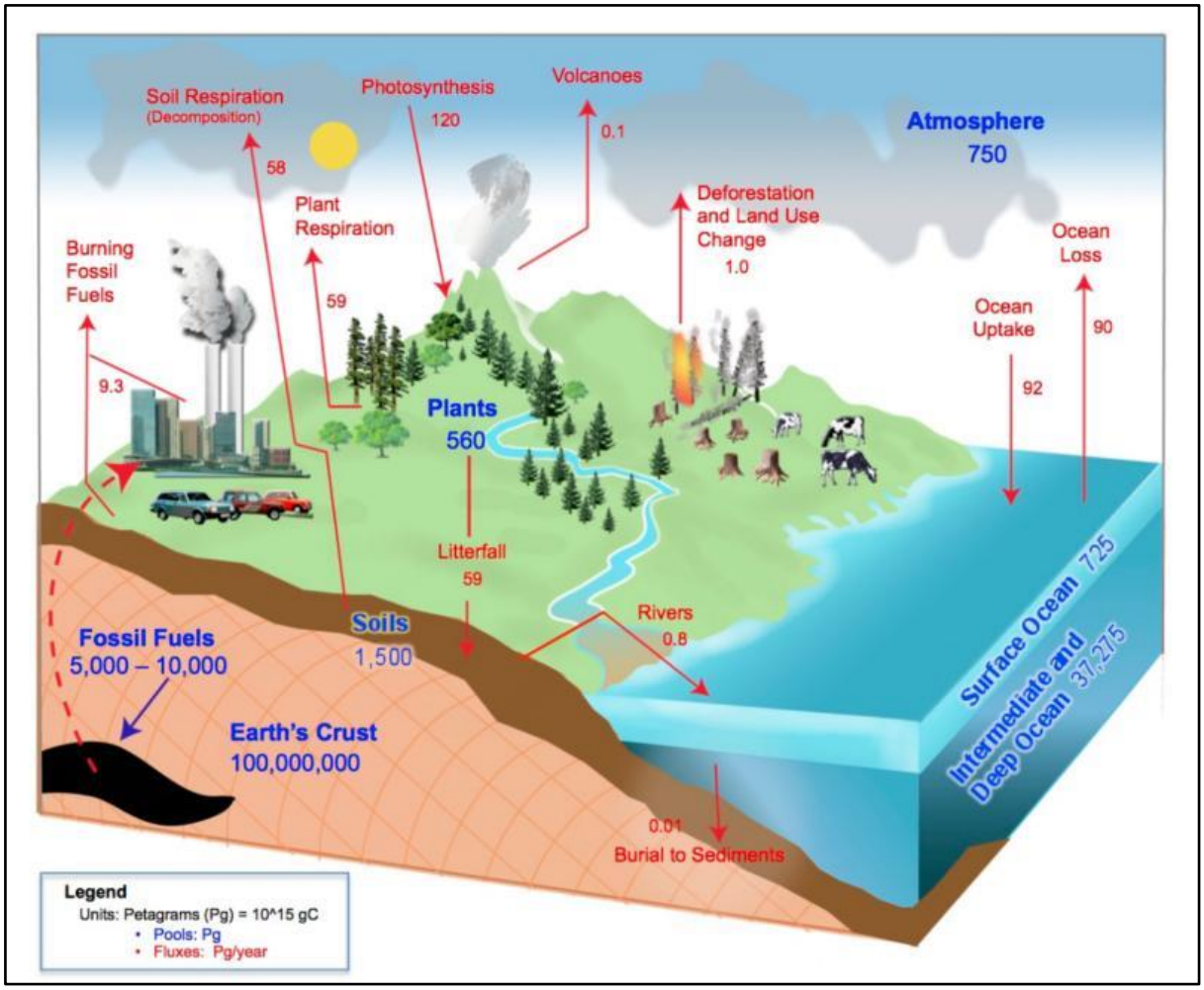
[40] Karen Hei-Laan Yeung, Carole Helfter, Neil Mullinger, Mhairi Coyle & Eiko Nemitz, 'From sink to source: long-term (2002-2019) trends and anomalies in net ecosystem exchange of $CO_2$ from a Scottish temperate peatland' (2020) EGU General Assembly Conference Abstracts, Provided by the SAO/NASA Astrophysics Data System, 5697, Doi: 10.5194/egusphere-egu2020-5967.

Additionally, a **part of the carbon intake gets seasonally shed through falling fruits, needles, branches, bark, and discarded roots.** This litter that is shed enters the soil, where it decomposes by microbiota in the soil, releasing nutrients into the soil and, most importantly, $CO_2$ back into the atmosphere. The same happens with the biomass of the whole tree dies. Then, some carbon may be locked into the soil temporarily, but will eventually leak back into the atmosphere. On top of that, the roots and the trunk of the tree are also sources of $CO_2$. Generally, trees allocate one-third of their total biomass to their roots, as they act as the physical anchor and source of water and inorganic nutrients. This uptake and transport of ions requires energy, which again, has $CO_2$ as its waste product. This $CO_2$ is released into the soil as well as back into the atmosphere. **The annual cycle of growing and decay of trees, that both takes in carbon and then releases that carbon, is a process that is only partially narrated to consumers in their forest-based "offsetting" schemes. By only portraying carbon-uptake, only half of the full-picture of the role of trees in the carbon cycle is given**.[41]

### B.1.4. Conclusion

Although forests play a role in neutralizing atmospheric carbon levels, **forest-based "compensation" projects are ineffective at directly and permanently abating $CO_2$-pollution**. This section outlined the issue of the temporariness of forest-based "offsetting" projects in comparison to the permanence of introducing additional carbon into the Earth's carbon cycle. **Emissions from coal, oil, and gas are virtually irreversible**, whereas terrestrial sinks are part of an active biological cycle where a substantial portion of the carbon that is locked-in terrestrial biosphere sinks is vulnerable to return to the atmosphere within a century. This illustrates that **terrestrial sinks should best be viewed as temporary reservoirs rather than permanent offsets to Shell's $CO_2$-pollution**. Oil and gas companies that contribute to carbon that remains in Earth's long-term carbon cycle system, while promoting $CO_2$ neutrality to consumers through "offset"-projects that contribute to the short-term carbon cycle, is not just a clear incompatibility, but a logical impossibility, and consumers are misled in the process.

[41] IGBP Terrestrial Carbon Working Group, 'The Terrestrial Carbon Cycle: Implications for the Kyoto Protocol' (2008) 280 *Science*, 1393.




*This graphic illustrates a number of important points about the carbon cycle: 1) Plants are no one-way "storage" of carbon: They take up carbon, but also re-emit it. 2) The relevance of plants in the short-term carbon cycle is paled by that of oceans: Forest-based "offsetting" can therefore influence the short-term carbon cycle only to a very limited degree. 3) The amount of carbon in fossil fuels is indefinitely larger than any take-up potential of forests. 4) Once the carbon in fossil fuels is released into the short-term carbon cycle, they will stay there permanently and harm the climate.*[42]

[42] The Globe Program, 'Globe Carbon Cycle' <https://www.globe.gov/do-globe/measurement-campaigns/past-projects/earth-as-a-system-projects/carbon-cycle> accessed 4 March 2021.

## B.2. An uncertain “solution” to a certain problem: the capacity of forests to “store” carbon is critically undermined by climate change

### B.2.1. Introduction

It is scientifically certain that burning fossil fuels creates $CO_2$-pollution that enters the short-term carbon cycle, which harms the climate. By contrast, the capacity of forests to “store” carbon over the coming decades (let alone centuries) is highly uncertain: **Climate change threatens to undermine the very ability of forests to “store” carbon**.

This effect materializes in abiotic disturbance risks, such as droughts and wildfires, as well as in biotic risks such as insect-borne pathogens. These risks are non-stationary and increase with climate change[43], as well as with interaction among disturbance agents.

As the potential **climate benefits from forest-based “offsetting” will become increasingly uncertain because of climate change**, they cannot be considered to be equivalent to the **climate harm caused by $CO_2$-pollution from fossil fuels, which is certain**.

### B.2.2. Forest disturbance risks

#### Droughts

Generally, plants respond to water deficits by reducing transpiration rates and net carbon assimilation rates, most importantly by decreasing growth.[44] Global warming-induced droughts impact various types of forests differently, but its effects have been observed in both dry forests as well as in wet (tropical) forests that are not normally considered water-limited.[45]

The Amazon, for instance, is a typically wet forest that has lost its functioning as a carbon sink due to drought, which has **increased tree mortality and lowered carbon sequestration rates**.[46] The bassins of the Peruvian Andes, where Shell is involved in

[43] Rupert Seidl et al., ‘Forest disturbances under climate change’ (2017) 7 Nat. Clim. Chang. 395.
[44] Alejandro Miranda et al., ‘Forest browning trends in response to drought in a highly threatened mediterranean landscape of South America’ (2020) 115 Ecological Indicators 106401; E Verkaik et al, ‘Potential impacts of climate change on Dutch forests’ (2009) Alterra report 1761 <https://edepot.wur.nl/4627> accessed 4 March 2021.
[45] Craig D. Allen et al., ‘A global overview of drought and heat induced tree mortality reveals emerging climate change risks for forests’ (2010) 259 Forest Ecology Management 660.
[46] Yan Yang et al., ‘Post-drought decline of the Amazon carbon sink’ (2018) 9 Nature Communications Article 3172.

the Cordillera Azul project, are becoming increasingly dry.[47] **Moreover, drought makes trees more vulnerable to other risks such as wildfires and pathogens**, as will be discussed in the next section. These trends are particularly concerning considering that forest vulnerability is generally being discounted due to difficulties in predicting threshold responses to extreme climatic events.[48]

### Wildfires

Wildfires are a corollary consequence of drought. Higher temperatures as a result of global warming are reducing moisture in the air and in trees, and thereby affecting the resilience of forests to wildfires. This resilience is also hampered post-fire, with decreased seedling density and higher chances of regeneration failure.[49] **Global models predict overall increases in wildfire activity and permanence risks**, albeit with regional variety in level of affectedness. This will cause significant disturbance risks in forests.

The Peruvian Andes forest, for instance, is becoming increasingly vulnerable to wildfire risk.[50] **Subsequent loss of vegetation and forest will release $CO_2$, diminish soil protection and lead to loss of $CO_2$ retention and sequestration capacity, again further contributing to global warming**. Forest fires are also an underestimated risk in areas more moderate climate such the Netherlands[51], exemplified by the **fire in the Deurnese Peel partly caused by dry conditions**.[52] Again, we find that the permanence of forests is increasingly threatened and that carbon sequestration rates of forests are decreasing.

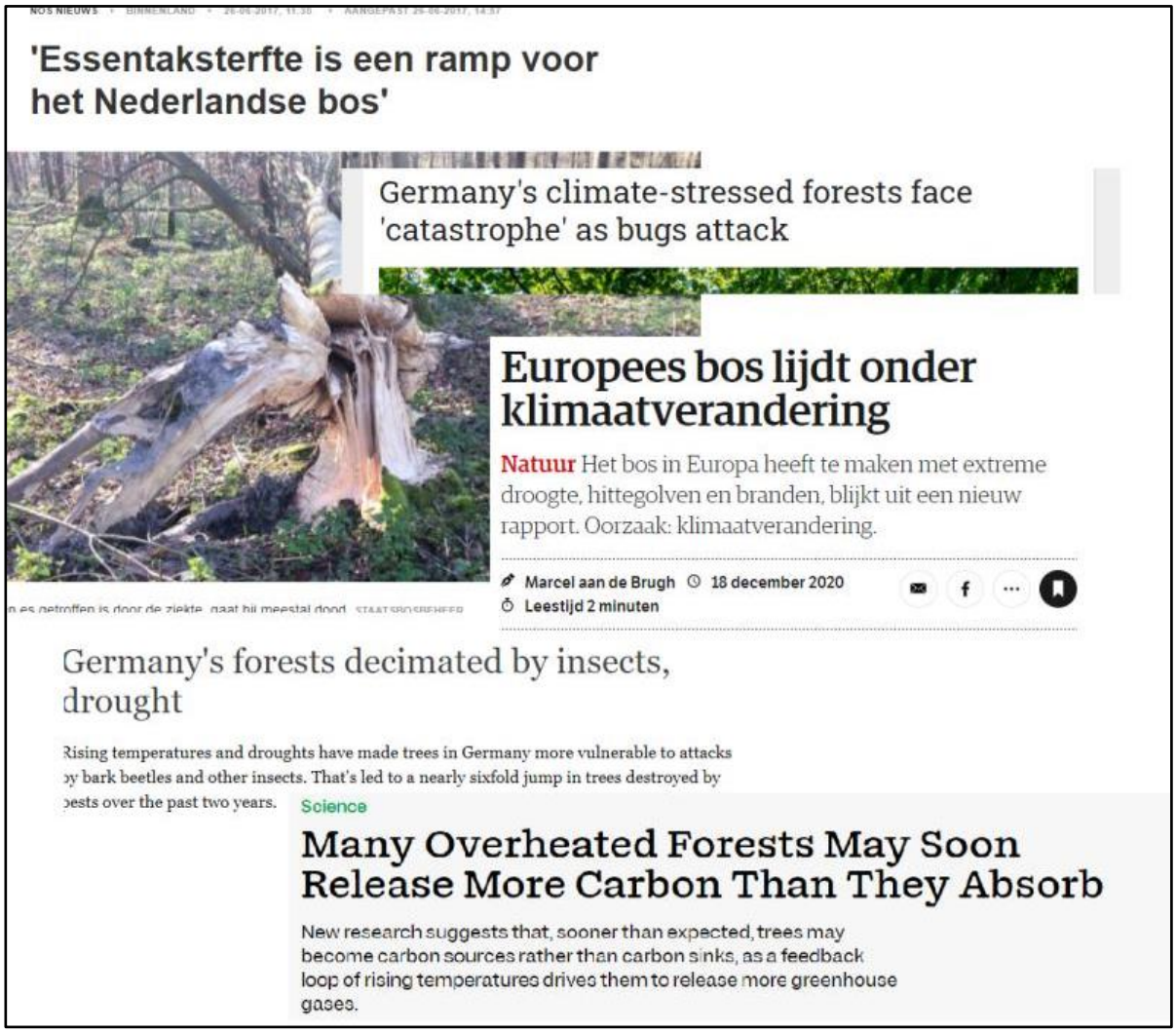
### Insect pests and pathogens

The direct effect of climate change on insect-borne pests relates mainly to the distribution of insects. As winter temperatures increase, certain forest insects retain a higher chance of surviving. **A warming climate will allow insects bearing pests to expand their distribution, mainly towards higher altitudes** and - for countries in the northern hemisphere - **towards the north.** In forests, the effects of this can be quite destructive: the **outbreak of the aggressive bark beetle, for instance, killed billions of trees across millions of hectares of land** in coniferous forests in the past

[47] Mathias Vuille et al, 'Climate change and tropical Andean glaciers: Past, present and future' (2008) 89 Earth Science Review 79.
[48] Craig D. Allen et al, 'On underestimation of global vulnerability to tree mortality and forest die-off from hotter drought in the Anthropocene' (2015) 6 Ecosphere 1.
[49] Camille S. Stevens-Rumann et al, 'Evidence for declining forest resilience to wildfires under climate change' (2018) 21 Ecology Letters 243.
[50] Maria I. Manta, Roberto Kometter, 'Evaluation of wildfire danger in the Peruvian Andes: First step for its reduction and adaptation' in D X Viegas (ed) *Advances in Forest Fire Research* (2018).
[51] Cathelijne R. Stoof, 'Nederland moet leren leven met vuur' *Nature Today* (20 July 2020) <https://edepot.wur.nl/529264> accessed 19 January 2021.
[52] Cathelijne R. Stoof et al, 'Relatie tussen natuurbeheer en brandveiligheid in de Deurnese Peel; Onderzoek naar aanleiding van de brand in de Deurnese Peel van 20 april 2020' (2020) Report Wageningen, Wageningen University & Research <https://edepot.wur.nl/533574> accessed 16 January 2021.

two decades.[53] In the Netherlands, where Shell has partnered with Staatsbosbeheer for an afforestation program, forest disturbances from insects have also aggravated over the past decades, for instance by the oak processionary moth.[54]

Adjacent to insect-borne pests are **airborne fungi**. The *chalara fraxinea* fungus, for example, has become invasive throughout Europe since the turn of the millenium, and caused an **ash tree dieback epidemic in the Netherlands** which is set to **affect almost all existing ash trees**.[55]

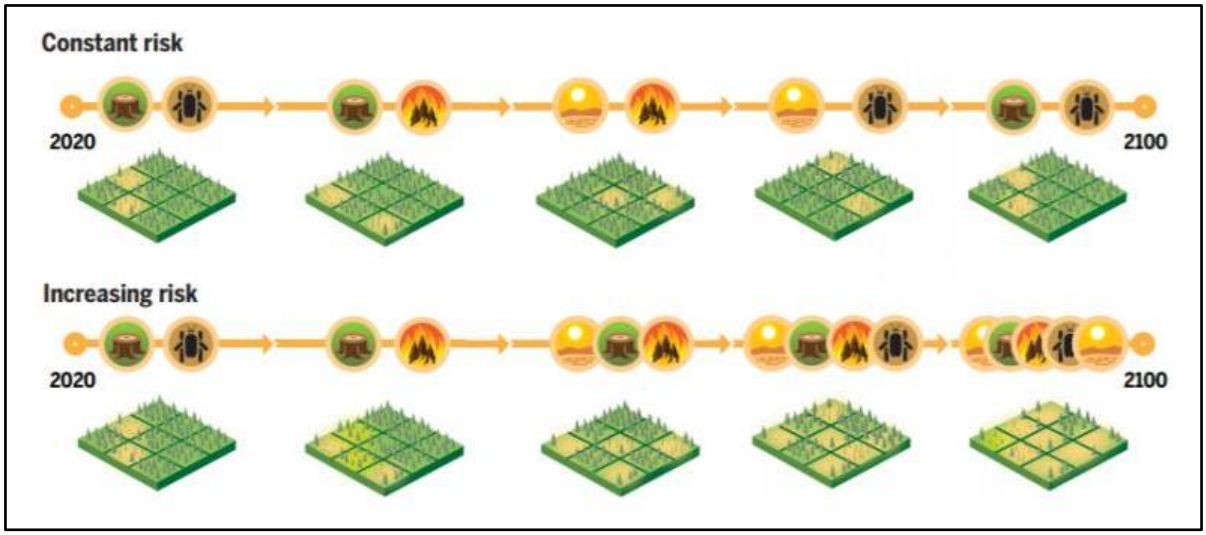



*Recent newspaper headlines reporting on the increased dangers forests face due to global warming.*

[53] Arjan J.H. Meddens, Jeffrey A. Hicke, Charles A. Ferguson, 'Spatiotemporal patterns of observed bark beetle-caused tree mortality in British Columbia and the western United States' (2012) 22 Ecol. Appl. 1876.
[54] Martin Godefroid et al, 'Current and future distribution of the invasive oak processionary moth' (2020) 22 Biological Invasions 523.
[55] Sven M.G. de Vries, Jitze Kopinga, 'Differences in susceptibility to Hymenoscyphus fraxineus (dieback of ash) of selections of Common ash (Fraxinus excelsior) in The Netherlands – Report of the observations and results of 2012 and 2015' in R Vasaitis (ed) *Dieback of European Ash* (The Report on European Cooperation in Science & Technology, 2017).

### B.2.3. Interaction between disturbance agents

Besides the individual impact of these disturbance risks, research has shown that they also interact with one another. **They are positively correlated and reinforce each other's effect.**[56] This indicates an amplification of disturbances overall as a result of agent interaction. For instance, **trees weakened by drought will be less resilient to fend off pathogens and will be more susceptible to forest fires.** Warmer and drier conditions especially facilitate fire, insect disturbances and drought, whereas warmer and wetter conditions intensify disturbance risks from wind and pathogens.[57]




*The graphic shows how various forest disturbances will have a more harmful, compounded effect with increasing climate change.*[58]

### B.2.4. Conclusion

The climate crisis increasingly undermines the ability of forests to function as carbon sinks due to (the interaction of) forest risks such as droughts, forest fires, pathogens and pests. **These risks are also present and have materialized in areas where Shell promotes "$CO_2$ compensation" projects**. The ability of forests to "store" carbon over the coming decades becomes increasingly uncertain as the climate crisis worsens. **Given this growing uncertainty, it is misleading to promote "compensation" as a "solution" to the certain climate harm caused by fossil fuels.**

[56] Rupert Seidl et al, 'Forest disturbances under climate change' (2017) 7 Nature Climate Change 395.
[57] Ibid.
[58] Ibid.

How fires have spread to previously untouched parts of the world

Fires have always been a part of our natural world. But they're moving to new ecosystems previously untouched by fire – and this is concerning scientists

This land is your land

Is this the end of forests as we've known them?

Trees lost to drought and wildfires are not returning. Climate change is taking a toll on the world's forests - and radically changing the environment before our eyes

by Alastair Gee

*Recent headlines from* The Guardian *(19 February and 10 March 2021) illustrate the enormous threats that forests are under.*[59]

[59] Pablo Gutiérrez et al, 'How fires have spread to previously untouched parts of the world' *The Guardian* (19 February 2021) <https://www.theguardian.com/environment/ng-interactive/2021/feb/19/how-fires-have-spread-to-previously-untouched-parts-of-the-world> accessed 4 March 2021; Alastair Gee, 'Is this the end of forests as we've known them?' *The Guardian* (10 March 2021),

## B.3. A conditional "solution" to an unconditional problem: "compensation"-projects benefit the climate only under conditions that are extremely difficult to meet, whereas the harm from fossil $CO_2$-pollution is unconditional

### B.3.1. Introduction

The **climate harm caused by $CO_2$-pollution from fossil fuels is unconditional**, i.e. it unfolds regardless of the specific circumstances of their release into the atmosphere. By contrast, the **realization of the alleged climate benefits from payments for forest-based "offset" projects** (such as the REDD-projects Shell promotes) **depends on the specific circumstances, and are therefore conditional**. According to their own logic, these projects are assumed to "offset" emissions equivalent to fossil $CO_2$-pollution only if they meet the conditions of "additionality", "avoidance of leakage" and "permanence". These conditions are uniformly recognized in the relevant policy instruments and research literature.[60] It is equally recognized that **these conditions are extremely difficult, if not impossible, to meet in practice**.[61] It can be shown, in particular, that Shell's REDD-projects fail to meet these criteria.

Consequently, the climate harm caused by $CO_2$-pollution from fossil fuels is not equivalent to the alleged climate benefits from "compensation" projects. The former is unconditional, whereas the latter depend on **conditions that are extremely unrealistic to meet**.[62]

### B.3.2. To "offset" $CO_2$-pollution from fossil fuels even in theory, "avoided deforestation" projects need to meet three conditions

According to their own logic, "avoided deforestation" (REDD) projects can claim emission reductions equivalent to $CO_2$-pollution from fossil fuels only if the following conditions are met:

- Payments for activities relating to avoiding deforestation can be assumed to "reduce" emissions only if these activities go beyond what would have occurred in absence of the payment. Without proof of **additionality**, no emission

<https://www.theguardian.com/environment/2021/mar/10/is-this-the-end-of-forests-as-weve-known-them> accessed 10 March 2021.

[60] UNFCCC, Decision 1/CP.16, Appendix I: 'Guidance and safeguards for policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries'.

[61] IPCC, 'Climate Change Synthesis Report' (2014) 105-106 <https://www.ipcc.ch/report/ar5/syr/> accessed 26 February 2021.

[62] Ing-Marie Gren et al, 'Policy design for forest carbon sequestration: A review of the literature' (2016) 70 Forest Policy and Economics 128, 130.

reduction equivalent to $CO_2$-pollution from fossil fuels can be attributed to the project.

- The financed activities need to actually prevent deforestation, and not merely displace it into different areas. Without proof that such **leakage** of deforestation activities to other forests is being avoided, no emission reduction equivalent to $CO_2$-pollution from fossil fuels can be attributed to the project.
- The deforestation of a forest must be avoided permanently. This means, in essence, that the forest must remain intact for all eternity. If a REDD-forest is ever destroyed (e.g. by fire, drought or logging) at any point in the future, all claimed "emission reductions" are wiped out immediately. Without proof of **permanence**, no emission reductions equivalent to $CO_2$-pollution from fossil fuels can be attributed to the project.

The conditions have been well-recognized since the inception of REDD+, both in the relevant policy instruments and in the academic literature.[63] Over the years, it has increasingly been realized that the **conditions are incredibly difficult, if not impossible to meet in practice**.[64] Mertz et al, for example, identify "many scientific challenges and disagreements [which] still make REDD+ implementation look very complex and uncertain".[65] Consequently, enthusiasm has waned considerably, and **REDD+ is now frequently seen as a failed concept**.[66] Duchelle et al, for example, state that "REDD+ has clearly been in trouble in recent years".[67] While it is viewed by some as a useful instrument for providing developing countries with finance to support forest conservation projects, **few scholars would still accept the initial proposition that REDD-projects could actually "offset" $CO_2$-pollution** in any straightforward way. Turnhout et al, for example, hold: "we can conclude that the expectations that carbon-centered REDD+ would be a simple and efficient mechanism for climate mitigation are not currently being met".[68] The just-mentioned three conditions - and the difficulties to meet them in practice - will now be discussed in more detail.

### B.3.3. Additionality cannot be guaranteed in practice

Logically, emission reductions from payments for forestry-related activities can be claimed only if the alleged benefits would not have been realized in absence of these

[63] Kevin Anderson, 'The inconvenient truth about carbon offsets' (2012) 484 Nature 7.
[64] Esther Turnhout et al, 'Envisioning REDD+ in a post-Paris era: between evolving expectations and current practice' (2017) 8 WIREs Climate Change 1; Kate Dooley et al, 'Governing by expertise: the contested politics of (accounting for) land-based mitigation in a new climate agreement' (2017) 17 Int Environ Agreements 483, 489.
[65] Ole Mertz et al, 'Uncertainty in establishing forest reference levels and predicting future forest-based carbon stocks for REDD+' (2018) 13 Journal of Land Use Science 1.
[66] Robert Fletcher et al, 'Questioning REDD+ and the future of market-based conservation' (2016) 30 Conservation Biology 673.
[67] Amy Duchelle et al, 'What is REDD+ achieving on the ground?' (2018) 32 Current Opinion in Environmental Sustainability 134, 139.
[68] Esther Turnhout et al, 'Envisioning REDD+ in a post-Paris era: between evolving expectations and current practice' (2017) 8 WIREs Climate Change 1, 8.

payments. However, it is difficult to prove that the payments created any additional benefit. For example, it is possible that a forest where a REDD-project is established would have remained intact even in absence of that project. This could be because the forest is located in an area that is already legally protected, or because it is inaccessible and therefore protected from deforestation activities in a practical manner. In such a situation the REDD-project would not meet the additionality requirement. In practice, REDD-projects are often established where forest conservation projects are already ongoing, for example in national parks (e.g. Shell's Cordillera Azul project). While such REDD-projects may provide welcome financial support for these conservation activities, they are obviously not avoiding additional deforestation.

The **additionality of a REDD-project is hard to prove** because it necessarily **relies on a hypothetical, counterfactual scenario** about how human activities in a forest would have developed in the absence of the project.[69] While methodologies have been developed to establish the counter-factual baselines against which a project's additionality is evaluated, scientifically, they remain highly controversial.[70] Mertz et al, for example, described these baselines as a **"flawed" concept that "does not guarantee additionality of REDD+ payments".**[71] Because "additionality" must necessarily be established by comparing the factual situation with an imagined, counter-factual situation, high uncertainty will always remain.

The hugely problematic nature of the baseline approach is recognized even by some of the strongest supporters of forest-based offsetting, such as the company Climate Focus: "Setting baselines for avoided deforestation projects is challenging. **Forecasting emissions trajectories into the future is difficult and hugely uncertain**. Deforestation is the result of complex socio-economic dynamics. The drivers of deforestation are hard to predict. Therefore, developing a counterfactual baseline scenario for forest programs tends to be more challenging if compared with projects in other sectors. Under the VCS, the use of reference areas by avoiding deforestation projects to model what would occur in a project area has, in some cases, resulted in the **cherry picking** of proxy areas, **leading to (unrealistic) volumes of carbon credits**".[72]

[69] Lambert Schneider, 'Assessing the Additionality of CDM Projects: Practical Experiences and Lessons Learned' (2009) 9 Climate Policy 242, 242.
[70] Grassi et al, 'The key role of forests in meeting climate targets requires science for credible mitigation' (2017) 7 Nature Climate Change 220; Ing-Marie Gren et al, 'Policy design for forest carbon sequestration: A review of the literature' (2016) 70 Forest Policy and Economics 128, 130.
[71] Ole Mertz et al, 'Uncertainty in establishing forest reference levels and predicting future forest-based carbon stocks for REDD+' (2018) 13 Journal of Land Use Science 12.
[72] Charlotte Streck et al, 'A close look at the quality of REDD+ carbon credits' (2020) 2 <https://www.climatefocus.com/sites/default/files/A%20close%20look%20at%20the%20quality%20of%20REDD+%20carbon%20credits%20(2020)%20V2.0.pdf> accessed 24 March 2021.

### B.3.4. The prevention of leakage cannot be guaranteed in practice

Even if a REDD-project successfully protects a specific forest area from deforestation, these activities may simply be continued elsewhere: less deforestation in one area then leads to more deforestation in another. This means that the **REDD-project creates no net benefit: closing one hole simply pulls open another hole elsewhere.**

In practice, avoiding leakage is a largely unsurmountable problem because **REDD-projects do not, and cannot address most drivers of deforestation, which are global forces**.[73] Logging, for example, is driven by the global economic demand for wood and pulp.[74] Deforestation for agricultural purposes is driven by the global economic demand for commodities like meat, palm oil and coffee. While a well-designed and -financed REDD-project may address certain local drivers of deforestation (e.g. smallholder agriculture), it cannot influence these global forces. Not surprisingly, a recent major study finds "a relatively high prevalence of deforestation leakage stemming from protected areas".[75] With global commodity demand unchanged, logging that is discontinued in one forest will simply be continued elsewhere. This makes the avoidance of leakage by a REDD-project extremely unlikely, but also extremely difficult (if not impossible) to prove.

### B.3.5. Permanence cannot be guaranteed in practice

In practice, **no human operator of a REDD-project can guarantee that the forest will still be around in five, ten or fifty years from now**, let alone that it will remain intact for all eternity.[76] However, precisely the latter would be necessary to "offset" $CO_2$-pollution from fossil fuels, which enter the carbon cycle permanently.

**Forests may be damaged by fire, droughts or pests**. As discussed in section B.2., these risks increase with progressing climate change. Forests may also be destroyed because of human activities that the project operator does not or cannot prevent, such as **illegal logging or mining**. The protection of forests against illegal activities is often dangerous, and requires strong political institutions that are frequently absent in developing countries. Finally, **project operators themselves may decide to exploit the forest differently when economic conditions change**, e.g. by logging the

[73] Grassi et al, 'The key role of forests in meeting climate targets requires science for credible mitigation' (2017) 7 Nature Climate Change 220.
[74] Edward Mitchard, 'The tropical forest carbon cycle and climate change' (2018) 559 Nature 527, 528.
[75] Ford et al, 'Deforestation leakage undermines conservation value of tropical and subtropical forest protected areas' (2020) 29 Global Ecology and Biogeography 2014.
[76] Kate Dooley, 'Misleading numbers — The case for separating land and fossil based carbon emissions' (2014) 18 <https://www.fern.org/publications-insight/misleading-numbers-the-case-for-separating-land-and-fossil-based-carbon-emissions-578/> accessed 18 February 2021.

forests for timber or for agricultural use.[77] In the face of these natural, political and commercial risks, no operator can seriously claim permanence for a REDD-project.

Methods that claim to address the problem of permanence exist, for example temporary credits (which are conditional on the continued existence of the forest) or buffer credits (where a certain amount of created credits is withheld in case the forest later turns from carbon sink to emission source, e.g. because of degradation or destruction).[78] However, temporary credits cannot stay temporary forever (otherwise the buyers of the credits could never actually use them), and buffer credits can never cover a full destruction of the forest (otherwise all created credits would have to be withheld as buffers). Consequently, **these instruments do not, and cannot, solve the problem that the permanence of a forest cannot be guaranteed**.

### B.3.6. Shell's "offset" projects fail to meet the conditions in practice

The "compensation" projects promoted by Shell illustrate the difficulties (or impossibility) of meeting the three conditions in practice.

First, **Shell's "offset" projects demonstrably do not meet the additionality requirement**. The Cordillera Azul project in Peru is established on a territory that has been a national park since 2001, long before the REDD-project was established.[79] Moreover, no deforestation in the national park could be detected in the years before the REDD-project was initiated.[80] This indicates that the **establishment of the REDD-project did not lead to any additional protection from deforestation**.

Similarly, **Shell's Katingan Mentaya project was established on territory which had already been put under protection by the Indonesian government**.[81] Since 2011, it has been subject to a government moratorium prohibiting the authorization of plantations, which the project itself identified as the only credible deforestation threat (see graphics below). Consequently, the subsequent establishment of the REDD-project **cannot possibly have avoided additional deforestation**.

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[77] Ing-Marie Gren et al, 'Policy design for forest carbon sequestration: A review of the literature' (2016) 70 Forest Policy and Economics 128, 132.
[78] Ibid 131-132.
[79] CIMA, 'Cordillera Azul National Park REDD Project' (2012) <https://s3.amazonaws.com/CCBA/Projects/Cordillera_Azul_National_Park_REDD_project/PNCAZPDDVCSV3September62012.pdf> accessed 1 March 2021.
[80] Chris Lang, '"Worse than doing nothing": Shell's REDD offsets in Indonesia and Peru' *REDD Monitor* (19 November 2020) <https://redd-monitor.org/2020/11/19/worse-than-doing-nothing-shells-redd-offsets-in-indonesia-and-peru/> accessed 1 March 2021.
[81] Greenpeace Germany, 'VW's Carbon Footprint Sham. How Volkswagen is using an ineffective compensation project to shirk potential $CO_2$ savings' (2020) 12 <https://www.greenpeace.de/presse/publikationen/vws-carbon-footprint-sham> accessed 1 March 2021.

Figure 4: Moratorium map of 20 May 2011 (green = protected forest areas, red = protected peatlands)

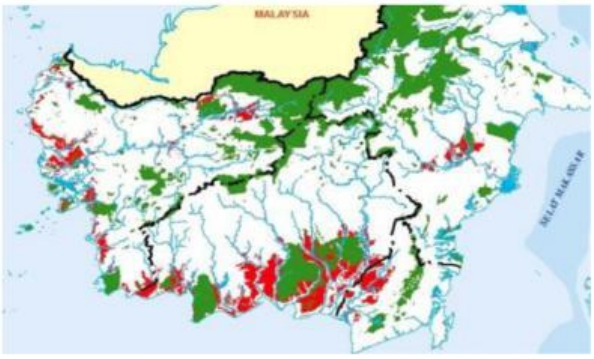
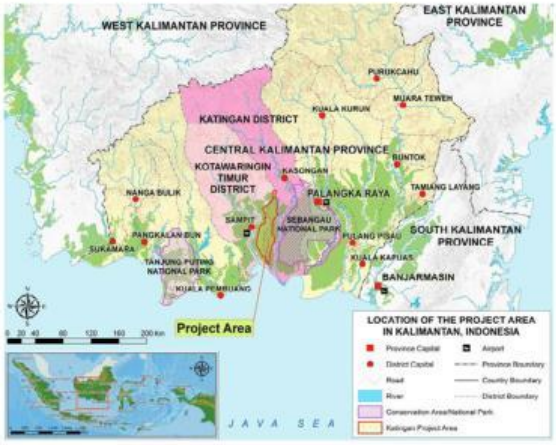



Figure 5: Map of the project area




*Before Shell's Katingan Mentaya REDD-project was established, it was already a protected area.*[82]

Second, while leakage is difficult to establish with certainty (but even more difficult to disprove), both of Shell's "compensation" projects **show signs of leakage**. Deforestation has increased around the Cordillera Azul-project, which is an indication that deforestation activities have "leaked" into these areas. Similarly, recent research indicates leakage of deforestation activities to the areas around Shell's Katingan Mentaya project.[83]

Finally, Shell's "compensation" projects also **fail to ensure permanence of their forests**. Over the past years, the Katingan Mentaya project area has increasingly been affected by fire. In 2016, it destroyed 6% of the total project area.[84] In 2019, 1.900 hectares burned down, and the "stored" carbon was thereby released into the atmosphere.[85] Permanence is therefore manifestly unguaranteed.

### B.3.7. Conclusion

According to their own logic, REDD-projects can realize their alleged climate benefits only under three conditions: permanence, additionality, and avoidance of leakage. These conditions are difficult or impossible to meet in practice. By contrast, the climate harm from fossil $CO_2$-pollution is unconditional. Consequently, there is no equivalence between the two: **Shell's "compensation" activities offer a merely conditional "solution" to an unconditional problem**.

[82] Ibid.
[83] Ibid 14.
[84] Chris Lang, '"Worse than doing nothing": Shell's REDD offsets in Indonesia and Peru' REDD Monitor (19 November 2020) <https://redd-monitor.org/2020/11/19/worse-than-doing-nothing-shells-redd-offsets-in-indonesia-and-peru/> accessed 1 March 2021.
[85] Daphné Dupont-Nivet, 'Het klimaatbos gaat in rook op' *De Groene Amsterdammer* (11 December 2019) <https://www.groene.nl/artikel/het-klimaatbos-gaat-in-rook-op> accessed 26 February 2021.

**Onderzoek** Hoe staat het met de CO2-compensatie?

# Het klimaatbos gaat in rook op

Vliegen zonder schaamte, klimaatneutraal autorijden. Volgens bedrijven als Shell en KLM is het prima mogelijk; gewoon de CO2-uitstoot compenseren in een exotisch bosgebied. Maar dan moeten die bossen wel blijven staan. En dat blijkt lang niet altijd het geval.

Daphné Dupont-Nivet

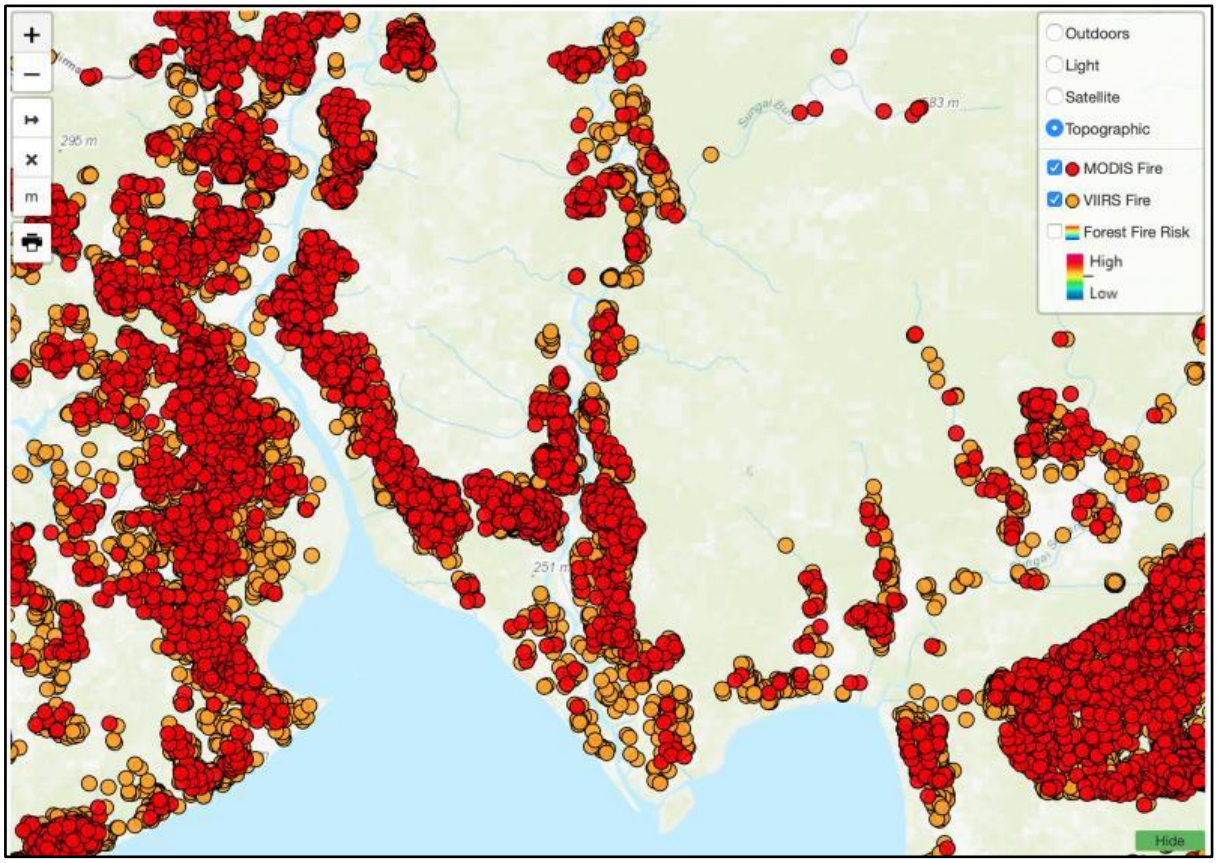
11 december 2019 – verschenen in nr. 50

Orang-oetan in Centraal- Kalimantan na de recente bosbranden. 23 september

© Fully Handoko / EPA / ANP

*No permanent lock-in of carbon: The Shell "compensation" forest is burning down.*[86]

[86] Ibid.




*Recorded fires in the Katingan Mentaya project area over the past five years.*[87]

[87] Firecast <https://firecast.conservation.org/DataMaps/LiveView> accessed 19 March 2021.

## B.4. Cutting fossil fuel use is the optimal solution to combat climate change, whereas “offsetting” is sub-optimal

### B.4.1. Introduction

$CO_2$-pollution from burning fossil fuels is the main driver of climate change. Cutting the use of fossil fuels is the most straightforward solution to the problem.

Shell’s promotion of the product “$CO_2$ compensation” as a means to “neutralize” $CO_2$-pollution from driving with fossil fuels creates the impression that emission reductions and “offsetting” both lead to the same climate outcome, and therefore would constitute viable alternatives. This is not true: **climate science shows that “offsetting” is not an alternative to emission reductions**. Radical emission cuts must be realized within this decade. ***Additionally,* forests must be protected** and expanded. Consequently, **both need to happen at the same time** in order to protect the earth from dangerous climate change.

However, the **planet’s capacity to grow additional forests is severely limited**. Wasting this capacity on unnecessary $CO_2$-pollution effectively **squanders this precious resource**. The continued use of fossil fuels for driving is largely unnecessary as **feasible and practical low- or zero-carbon forms of personal transportation exist.**

From a perspective of climate policy, the **avoidance of $CO_2$-pollution is the optimal solution** to the problem of climate change. By contrast, **the product “$CO_2$ compensation” (in conjunction with a continued use of fossil products) offers a merely sub-optimal “solution.”** Consequently, the two are not equivalent from a perspective of climate policy.

### B.4.2. $CO_2$-pollution from transport must be cut radically within this decade to reach the Paris goals

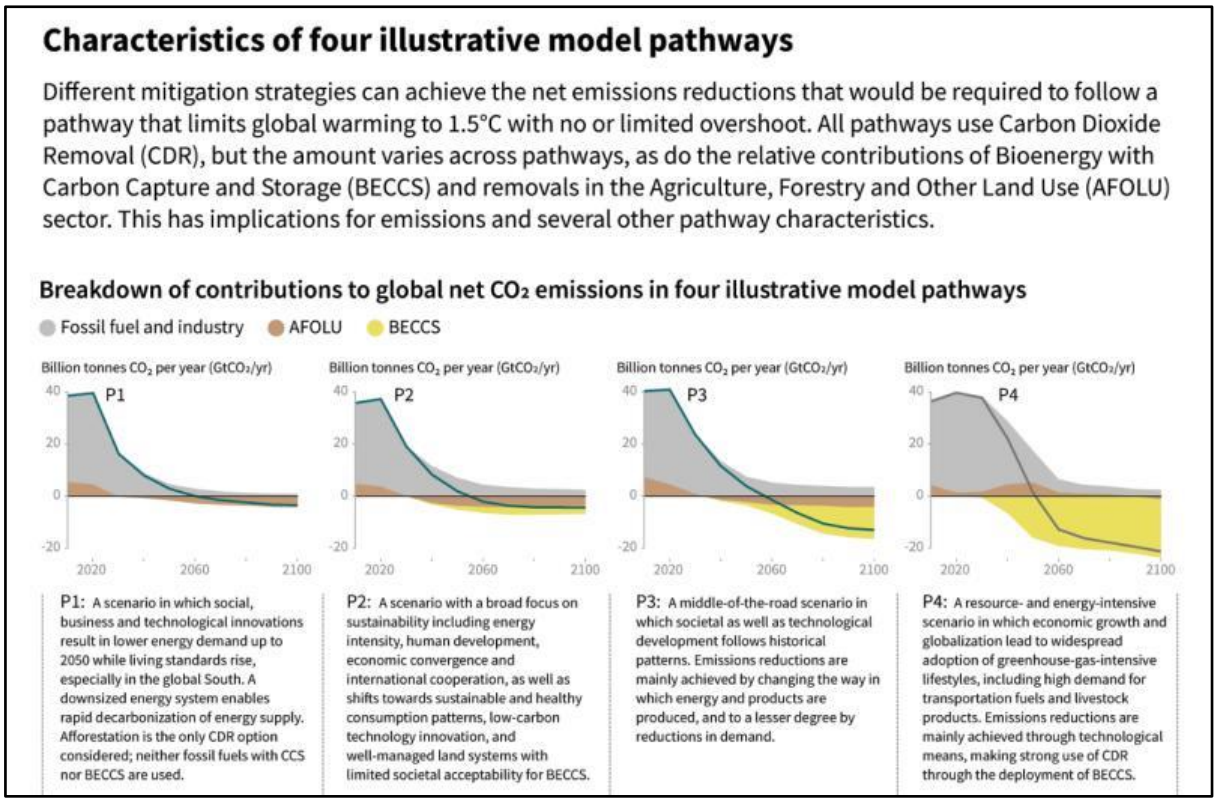
The reduction of $CO_2$-pollution constitutes an obligation under international law. The Paris agreement requires states to “aim to reach global **peaking of greenhouse gas emissions as soon as possible.”**[88] This means very specifically that reductions are required. Failing to reduce emissions or delaying emission reductions therefore conflicts with the Paris Agreement.

Science shows unequivocally that steep and immediate cuts in the use of fossil fuel are necessary. To meet the goal set by the Paris Agreement, $CO_2$-pollution must be

[88] Article 4.1. Paris Agreement (adopted 12 December 2015, entered into force 4 November 2016) UNTC 54113.

reduced by as much as 45% within this decade.[89] This necessitates a massive reduction in the production and use of fossil fuels, which are the main source of $CO_2$-pollution.[90]

Because the climate crisis is advancing so quickly, all available means must be deployed to mitigate it. The IPCC has developed pathway models indicating how to achieve limited global warming of 1,5 °C. These models show that **significant reductions of polluting activities** need to be achieved *alongside* mechanisms to "capture" $CO_2$-pollution from the atmosphere. In connection with these calculations, the report states that "**far-reaching transitions in energy, land, urban and infrastructure** (including transport and buildings), and industrial systems"[91] are needed.




*Pathway models of the IPCC showing that both reductions and offsetting of anthropogenic carbon emissions are necessary to limit climate change.*[92]

Consequently, significant emission cuts must be achieved in the transport sector, which is responsible for ca. 15% of energy-related greenhouse gas emissions.[93] The

[89] Intergovernmental Panel on Climate Change (IPCC), 'Global Warming of 1.5°C' (2018) 12.
[90] Intergovernmental Panel on Climate Change (IPCC), 'Climate Change 2014: Synthesis Report' (Assessment Report 5, 2014) 45-46.
[91] Intergovernmental Panel on Climate Change (IPCC), 'Global Warming of 1.5°C' (2018) Summary for Policymakers 12, 18.
[92] Ibid 14.
[93] Intergovernmental Panel on Climate Change (IPCC), 'Climate Change 2014: Synthesis Report' (Assessment Report 5, 2014) 47.

International Energy Agency recently called for greater change efforts to cut emissions in the transport sector.[94]

### B.4.3. Capacities to expand forests are highly limited

As just shown, the IPCC pathways to reach the Paris goal rely, in addition to steep emission cuts, on technologies to "capture" $CO_2$-pollution from the atmosphere. The problem is that **these technologies do not (yet) exist**. A recent study published in in the renowned science journal *Nature* states in this regard: "The IPCC suggests that around 730 billion tonnes of $CO_2$ (730 petagrams of $CO_2$, or 199 petagrams of carbon, PgC) must be taken out of the atmosphere by the end of this century. That is equivalent to all the $CO_2$ emitted by the United States, the United Kingdom, Germany and China since the Industrial Revolution. **No one knows how to capture so much $CO_2$.**"[95] Similarly, a recent report of the European Academies Science Advisory Council (EASAC) states that the potential of "offsetting" technologies is highly overestimated.[96]

This is also the case for the "offsetting" potential of forests. Scientific evidence shows that the **carbon uptake capacities of plants is much lower than previously assumed**.[97] Moreover, the **global "offsetting" capacity of forests is significantly limited by the vast amount of land that it would require**. The EASAC report shows that up to 970 million hectares of land surface would need to be afforested in order to remove 1.1–3.3 gigatonnes of $CO_2$-pollution per year.[98] This surface is equivalent to the Earth's possibly cultivated land for agriculture.[99] Conflicts regarding the use of fertile soils on this planet will significantly limit the extent to which afforestation can be employed to mitigate climate change.[100]

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[94] International Energy Agency, 'Tracking Transport 2020' (2020) <https://www.iea.org/reports/tracking-transport-2020/electric-vehicles> accessed 24 January 2021.

[95] Simon Lewis et al., 'Restoring natural forests is the best way to remove atmospheric carbon' (2019) 568 Nature 25

[96] European Academies Science Advisory Council (EASAC), 'Negative emission technologies: What role in meeting Paris Agreement targets?' (2018) 1 <easac.eu/fileadmin/PDF_s/reports_statements/Negative_Carbon/EASAC_Report_on_Negative_Emission_Technologies.pdf> accessed 26 February 2021.

[97] European Academies Science Advisory Council (EASAC), 'Forest bioenergy, carbon capture and storage, and carbon dioxide removal: an update' (2019) <https://easac.eu/fileadmin/PDF_s/reports_statements/Negative_Carbon/EASAC_Commentary_Forest_Bioenergy_Feb_2019_FINAL.pdf> accessed 13 January 2020.

[98] European Academies Science Advisory Council (EASAC), 'Negative emission technologies: What role in meeting Paris Agreement targets?' (2018) 17 <easac.eu/fileadmin/PDF_s/reports_statements/Negative_Carbon/EASAC_Report_on_Negative_Emission_Technologies.pdf> accessed 26 February 2021.

[99] SOWIT, 'A renewed vision for African Agriculture & Agro-industries' (2019) <https://en.sowit.fr/post/a-renewed-vision-for-african-agriculture-agro-industries> accessed 12 January 2021.

[100] Michael Marshall, 'Planting trees doesn't always help with climate change' *BBC Future* (26 March 2020) <https://www.bbc.com/future/article/20200521-planting-trees-doesnt-always-help-with-climate-change> accessed 13 January 2020.

### B.4.4. $CO_2$-pollution from driving is avoidable, and scarce "offsetting" resources should not be squandered on it

Effective offsetting for fossil $CO_2$-emissions will only be possible for a very small part of the fossil-intense activities that human beings conduct nowadays. A decision must be made for which emissions these capacities should be used. This entails that the $CO_2$-polluting activities that are technologically and socially irreplaceable need to be defined. At the centre stands the question "Which emissions are currently unavoidable?"

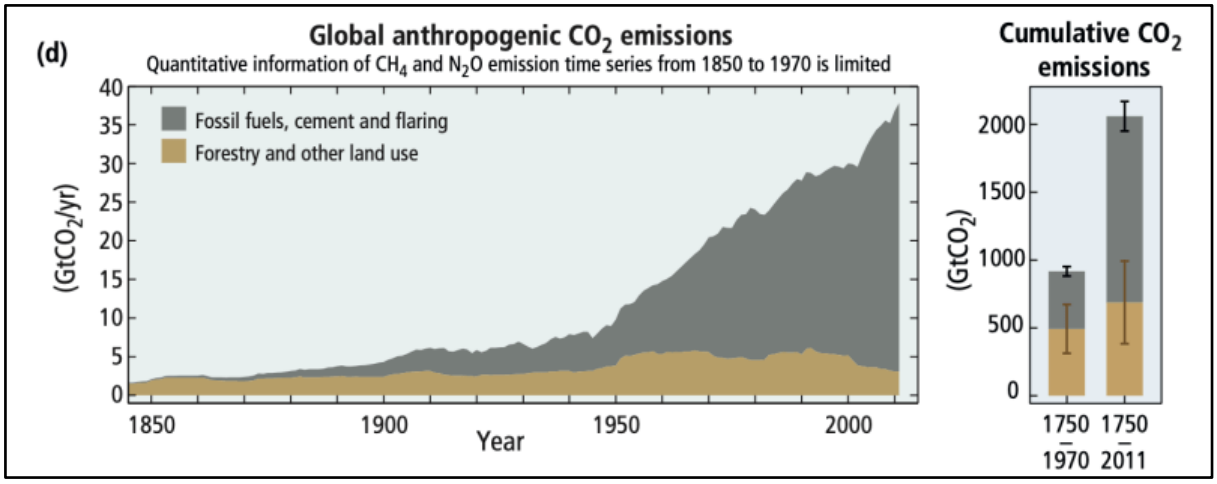
When dealing with this question, the main criteria ought to be the technical aspect 'avoidability of emissions' of an activity and its 'social importance'. All activities which lie not in the field of these 'irreplaceable' need to be cut in order to shift towards net-zero. The determination of socially necessary activities needs to be determined by inclusive societal processes. But with regards to 'avoidability' in the transportation sector, **highly functional, equivalent alternatives to $CO_2$-polluting vehicles exist already today**.[101] Consequently, scarce "offsetting" resources should not be squandered on avoidable $CO_2$-pollution from driving.

### B.4.5. Conclusion

To reach the Paris goal, steep fossil emission cuts are necessary, including in the transport sector. The climate crisis has already so far advanced that **fossil emission reductions and the protection of forests must be deployed in conjunction** and not alternatively. Global capacities to expand forests are extremely limited and therefore constitute a scarce resource which should not be wasted on "compensation" for avoidable $CO_2$-pollution. $CO_2$-pollution from driving is avoidable, as functional low- and zero-carbon alternatives exist.

The optimal solution to address $CO_2$-pollution from fossil fuels is to cut their production and use. By contrast, the product **"$CO_2$ compensation" offers a merely sub-optimal "solution" to the climate problem**, and is therefore not equivalent to the former.

[101] David Bannister, 'The climate crisis and transport' (2019) 39 Transport Review 565; Ran Tu et al, 'Reducing Transportation Greenhouse Gas Emissions Through the Development of Policies Targeting High-Emitting Trips' (2018) 2672 Transport Research Record 11; Damian Carrington, 'Electric vehicles close to 'tipping point' of mass adoption' *The Guardian* (22 January 2021).




*Fossil fuels are the main source of $CO_2$-pollution. Cutting their use is the optimal way of combating dangerous climate change.*[102]

[102] IPCC, 'Climate Change Synthesis Report' (2014), Summary for Policymakers, 3 <https://www.ipcc.ch/report/ar5/syr/> accessed 26 February 2021.

## B.5. An unmeasurable “solution” to a measurable problem: the carbon take-up potential of forests cannot be measured in a precise manner, whereas the $CO_2$-pollution from fossil fuels can

### B.5.1. Introduction

**Measuring the $CO_2$-pollution from fossil fuels can be done with considerable scientific certainty**. Moreover, the human activities which cause these emissions are well-known: Ceasing those activities constitutes a scientifically certain way to reduce climate harm. By contrast, the **measurement of the carbon “stored” in forests is generally difficult, and frequently not possible at all**. The same is the case for changes to the carbon stock over time, and the influence human activities have on it: Forest carbon fluxes are shaped by many complex and dynamic factors, many of which cannot be measured at all, or not accurately. Climate scientists therefore uniformly describe the forest carbon stock and its development over time as “the most uncertain component of the global carbon budget.”[103] This implies that the concrete climate effect of specific forest-related human activities (such as Shell’s “compensation” projects) remains highly uncertain. The **harm caused by Shell’s fossil fuels is measurable**, whereas the **benefits from Shell’s “compensation” projects cannot be established in a scientifically sound manner**.

### B.5.2. Emissions from fossil fuels can be measured accurately, but the forest carbon stock cannot

The $CO_2$-pollution caused by fossil fuels can be established relatively easily. It is similar per unit of use, e.g. per litre of gasoline.[104] It therefore can, according to Dooley, “be estimated or measured at source and extrapolated with reasonable confidence, particularly in countries with data on energy supply and demand (i.e. most industrialised countries).”[105] While there is, according to Gren et al, “some uncertainty in the conversion of fossil fuel products to carbon dioxide equivalents”, such uncertainty “is negligible compared with that in carbon sequestration” (i.e., forest carbon uptake).[106]

The obvious reason for this difference is that fossil fuel products are industrially manufactured, standardized products, whereas forests are not. **Many variables**

[103] Giacomo Grassi et al, ‘Reconciling global-model estimates and country reporting of anthropogenic forest $CO_2$ sinks’ (2018) 8 Nature Climate Change 914, 915; Edward Mitchard, ‘The tropical forest carbon cycle and climate change’ (2018) 559 Nature 527.
[104] Ing-Marie Gren et al, ‘Policy design for forest carbon sequestration: A review of the literature’ (2016) 70 Forest Policy and Economics 128, 129.
[105] Kate Dooley, ‘Misleading numbers — The case for separating land and fossil based carbon emissions’ (2014) 9 <https://www.fern.org/publications-insight/misleading-numbers-the-case-for-separating-land-and-fossil-based-carbon-emissions-578/> accessed 18 February 2021.
[106] Ing-Marie Gren et al, ‘Policy design for forest carbon sequestration: A review of the literature’ (2016) 70 Forest Policy and Economics 128, 129.

**influence the carbon stock of a forest: The tree species, age, soil, topography, region, weather and climate conditions, as well as the level of forest degradation**. Moreover, the carbon stock is seasonally variable; Weather events like El Nino or droughts can turn a forest from a carbon sink into a carbon source.[107] In order to make a scientifically sound estimation about the forest carbon stock, **all of these variables would have to be measured accurately**. However, this is frequently **not possible** because of **technological, financial and time constraints**.

The forest carbon stock is typically classified into five categories ("carbon pools"): above-ground biomass (i.e., the tree trunk, branches and leaves); below-ground biomass (i.e., the roots); dead wood; litter (i.e., humus layers on the soil); and organic carbon in the soil.[108] Existing methods struggle to determine the volume of these carbon pools for specific forests. The most important method, **remote sensing by satellite, cannot provide information about any of the five categories except one (i.e., what is visible from the air)**. Even the information on above-ground biomass that can be provided by means of remote sensing is limited: while deforestation can be detected to a sufficient degree, this is not the case for forest degradation.[109] Satellite data is, moreover, limited by its low resolution.[110] While higher-resolution imaging is possible in principle, it is expensive and thus not deployable at scale.[111] Moreover, **results from different measurement methods vary by as much as 100%.**[112]

Reliable information about the latter four carbon pools (i.e., everything on and below the ground) can be acquired only by means of on-the-ground sampling. **Given the high variability of forests, a great number of sample plots would be necessary**. This is **exceedingly resource-intensive, and often simply impossible** when the forest is not accessible from the ground.[113] Even if, despite the prohibitive costs, high-resolution remote-sensing and intensive on-the-ground sampling were now to be deployed systematically, the informational value would still be limited because of the high variability of forests: To reduce the uncertainty stemming from this variability,

[107] Edward Mitchard, 'The tropical forest carbon cycle and climate change' (2018) 559 Nature 527, 529.
[108] Kate Dooley, 'Misleading numbers — The case for separating land and fossil based carbon emissions' (2014) 11 <https://www.fern.org/publications-insight/misleading-numbers-the-case-for-separating-land-and-fossil-based-carbon-emissions-578/> accessed 18 February 2021, 11
[109] Edward Mitchard, 'The tropical forest carbon cycle and climate change' (2018) 559 Nature 527, 528-529.
[110] Ibid, 527.
[111] Kate Dooley, 'Misleading numbers — The case for separating land and fossil based carbon emissions' (2014) 11 <https://www.fern.org/publications-insight/misleading-numbers-the-case-for-separating-land-and-fossil-based-carbon-emissions-578/> accessed 18 February 2021.
[112] Ibid 13.
[113] Edward Mitchard, 'The tropical forest carbon cycle and climate change' (2018) 559 Nature 527.

historical data of comparable quality would be necessary, which does not exist. This "**lack of historical data is a widely recognised problem**" in climate science.[114]

To sum up, the difference between measuring the carbon content of fossil fuels on the one hand and of the forest carbon stock could not be greater. Whereas the former can be established with precision, great uncertainty exists about the latter.

### B.5.3. Great uncertainty exists about how human activities influence the forest carbon stock over time

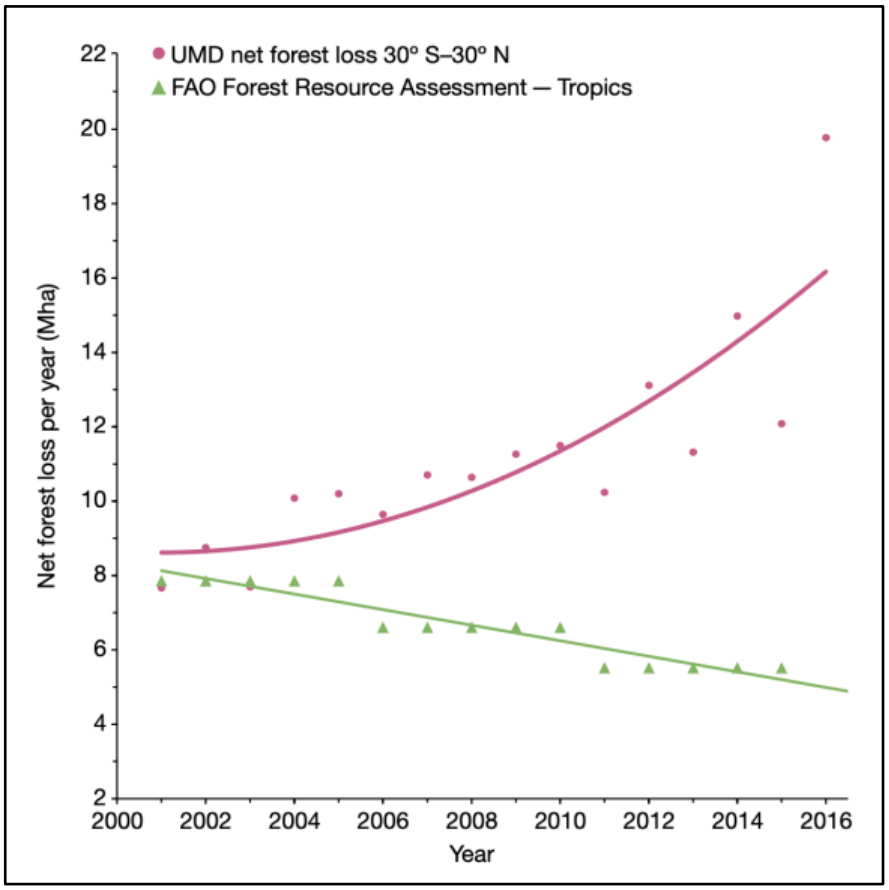
The emission of $CO_2$-pollution from fossil fuels is directly caused by human activities: Without their extraction, transport, processing and combustion there are no emissions from fossil fuels. This means that the quantity of $CO_2$-pollution from fossil fuels that enter the carbon cycle is a direct consequence of identifiable human choices. Consequently, **it is known with relative certainty which human actions lead to which amount of $CO_2$-pollution from fossil fuels**.

By contrast, **how human activities influence the forest carbon stock over time is highly uncertain**. The reason for this uncertainty is that **forest carbon fluxes are influenced by many complex and dynamic factors**. Three main types can be distinguished:[115] 1) Direct human-induced effects (such as deforestation or reforestation); 2) Indirect human-induced effects, such as changes in temperature, precipitation and atmospheric $CO_2$-levels connected with climate change. These effects influence plant growth and mortality, as well as forest disturbance risks. 3) Natural effects, such as climate variability and natural disturbances.

**Many of these factors cannot be measured at all, or cannot be measured with sufficient accuracy**. For example, the key question to what extent variability in atmospheric $CO_2$ concentrations is driven by natural processes is still unclear.[116] Consequently, the attribution of concentration changes to specific sources and sinks is highly uncertain. In essence it is **impossible to disentangle direct human-induced effects from indirect human-induced and natural effects** in a scientifically robust manner.[117] Uncertainty exists even on the most basic questions, for example whether the total deforestation rate is increasing or decreasing.[118] Depending on the

[114] Kate Dooley, 'Misleading numbers — The case for separating land and fossil-based carbon emissions' (2014) 11 <https://www.fern.org/publications-insight/misleading-numbers-the-case-for-separating-land-and-fossil-based-carbon-emissions-578/> accessed 18 February 2021.
[115] Giacomo Grassi et al, 'Reconciling global-model estimates and country reporting of anthropogenic forest $CO_2$ sinks' (2018) 8 Nature Climate Change 914, 915.
[116] Glen Peters et al, 'Towards real-time verification of $CO_2$ emissions' (2017) 7 Nature Climate Change 848.
[117] Giacomo Grassi et al, 'Reconciling global-model estimates and country reporting of anthropogenic forest $CO_2$ sinks' (2018) 8 Nature Climate Change 914, 915.
[118] Edward Mitchard, 'The tropical forest carbon cycle and climate change' (2018) 559 Nature 527, 530.

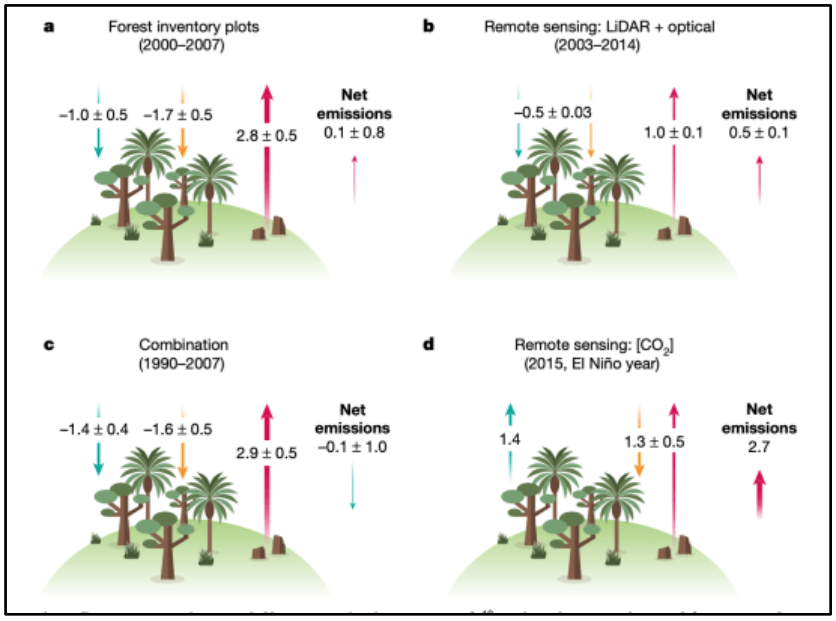
used data set, completely different estimations are given, as the following graphic shows.




*Different datasets lead to very different estimations about deforestation trends.*[119]

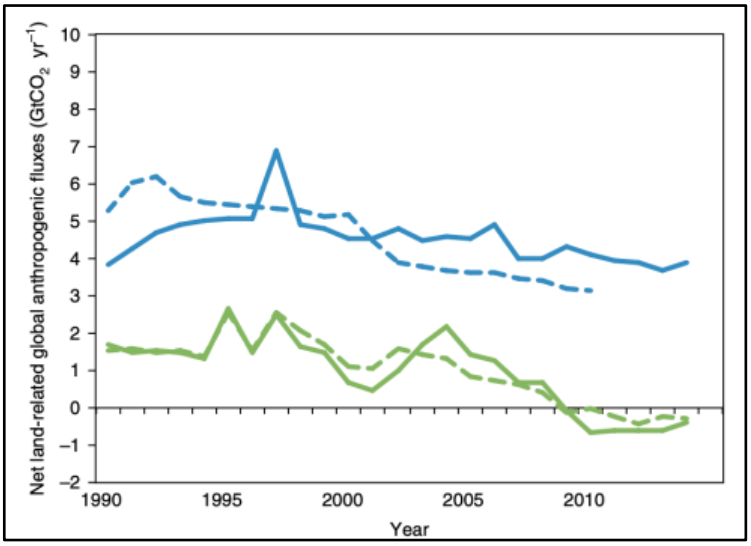
Because most of the factors influencing the forest carbon flux are difficult or impossible to establish in a scientifically robust manner, **any prognosis about future developments will remain highly uncertain**. For example, estimations on the increase in plant growth stemming from higher atmospheric $CO_2$ levels range from +10% to +52%.[120] This lack of robust information about forest fluxes makes, according to Mitchard, "accurate estimation of trends in the sink very difficult. This uncertainty greatly limits the development and testing of theories and models, and thus means that there is a wide divergence of predictions as to how the sink will change under different climate-change scenarios and policy interventions."[121]

[119] Ibid.
[120] J Campell et al, 'Large historical growth in global terrestrial gross primary production' (2017) 544 Nature 84.
[121] Edward Mitchard, 'The tropical forest carbon cycle and climate change' (2018) 559 Nature 527.




*Depending on the employed methods and models, estimates about the forest carbon flux vary significantly.*[122]

These scientific difficulties in establishing the carbon forest flux and in forecasting its future development mean that **numbers on the present and future forest carbon takeup vary widely**. For example, Grassi et al show that the gap between the land-use fluxes established on the basis models employed by the IPCC on the one hand, and by those reported by the states under the UNFCCC on the other is as high as 4 Gigatonnes $CO_2$ per year (see graphic below).[123]




*A significant gap exists between the estimated land-use fluxes as reported by the states on the one hand, and as calculated on the basis of IPCC models on the other.*[124]

[122] Ibid 529.
[123] Giacomo Grassi et al, 'Reconciling global-model estimates and country reporting of anthropogenic forest $CO_2$ sinks' (2018) 8 Nature Climate Change 914.
[124] Ibid 915.

This section has shown that the change of the forest carbon stock over time is extremely hard to estimate with any certainty, and the effect of forest-related human activities (such as deforestation or reforestation) cannot be delineated from the many other factors that influence the forest carbon flux. By contrast, the $CO_2$-pollution from fossil fuels can be established with precision, and it is well-known which human activities influence it.

### B.5.4. Conclusion

The extraction, processing, transportation and combustion of fossil fuels cause $CO_2$-pollution at volumes that can be measured and extrapolated in a scientifically robust way; little uncertainty exists about which human activities would have to be ceased in order to reduce $CO_2$-pollution from fossil fuels.

By contrast, the carbon stock of forests and how it changes is highly difficult to measure, and extrapolations lead to great uncertainties. Moreover, the influence of human activities (e.g. deforestation, reforestation or protection) on the carbon flux is impossible to establish in a scientifically robust manner, because they cannot be distinguished from the numerous other human and non-human factors that affect the carbon stock of forests. Consequently, global estimations about the carbon take-up potential of forests over time are burdened by high uncertainties. This problem gets worse on the regional and local level: **Sound estimations about the carbon take-up potential of specific forests** and about the effect that concrete human activities have on it (such as setting up a particular “offsetting”-project) **are impossible**.

“Compensation” presupposes an equivalence between the emission of $CO_2$-pollution from fossil fuels on the one hand, and carbon sequestration by means of forest-related activities on the other. However, **no such equivalence exists**, because the former is measurable and quantifiable in a scientifically sound way, whereas the latter is not. Consequently, “compensation” constitutes an unmeasurable “solution” to a measurable problem.

## B.6. A hypothetical “solution” to a real problem: “compensation” projects create “carbon credits” on the paper alone, but do not actually pull out present-day $CO_2$-pollution from the atmosphere

### B.6.1. Introduction

**“$CO_2$ compensation” projects do not physically pull out present-day $CO_2$-pollution from the atmosphere:** Their alleged “climate benefits” are of a **purely calculatory or hypothetical** character. By contrast, the combustion of fossil fuels permanently releases real, physical, present-day $CO_2$-pollution into the carbon cycle. The former cannot and should not be viewed as equivalent to the latter.[125] It is thus **misleading to suggest that calculatory or hypothetical $CO_2$-reductions could “compensate” for actual, physical, present-day $CO_2$-pollution from fossil fuels.**

Shell promotes two types of “compensation” mechanisms: 1) payment for **“voluntary carbon credits” for allegedly protecting existing forests**; and 2) payment to **Staatsbosbeheer for planting trees**. Only the first is part of the “Drive $CO_2$ neutral” campaign. In **neither case does the promoted activity actually remove any $CO_2$-pollution from the atmosphere in a physical sense**. The first merely creates “calculatory” emission reductions; The second may, at best, lead to carbon take-up of unknown quantity in the far future, and therefore can be described as “hypothetical” in nature. **Neither calculatory nor hypothetical “compensation” can actually “neutralize” present-day, real $CO_2$-pollution from fossil fuels**: The former exist in the books only, whereas the latter causes actual harm in the real world.

### B.6.2. “Carbon credits” generated for allegedly protecting forests exist on paper only - they do not represent actual, physical reductions of fossil $CO_2$-pollution

“Voluntary carbon credits” play a central role in Shell’s promotion of “$CO_2$ compensation.” However, they do not represent any actual, physical reduction of fossil $CO_2$-pollution. Instead, they are **the result of calculations alone.** Consequently, they can be termed “calculatory” or “paper-only” reductions (as opposed to actual, physical reductions).

“Voluntary carbon credits” are created through calculation. The calculation **relies on two variables that are difficult to determine, and impossible to ascertain accurately**.

[125] Duncan McLaren et al, ‘Beyond “Net-Zero”: A Case for Separate Targets for Emissions Reduction and Negative Emissions’ (2019) 1 Frontiers in Climate, Article 4, 1.

First, the "carbon pool" of the project (the stock of carbon supposedly held by the forest) must be established. From an empirical perspective, this is extremely difficult, and fraught with uncertainties.[126] Dooley holds that "**accounting for land use carbon emissions is imprecise, costly and resource intensive, and the word 'accounting' — which implies real numbers — is misleading**."[127] In practice, empirical research is rarely employed to calculate the carbon stock of the specific forest in question.[128] Instead, broad estimations and extrapolations are relied upon, and many factors that are difficult to establish are simply excluded from the calculation.[129] (see also Section B.5.)

Second, the "baseline scenario" must be established, i.e., the hypothetical development of that carbon pool in absence of the "compensation" project. For this purpose, counterfactual (i.e., imagined) scenarios have to be developed, which essentially represent the "worst case" that is allegedly avoided because of the project.[130] For example, it can be claimed that a forest would have been completely cut down in absence of the project.[131] Given that it **relies on the imagination of an alternative history that did not actually take place** ("what would have happened if the project had not been set up?") the process is - necessarily - of a highly imprecise nature.

The number of "voluntary carbon credits" that the forest project "creates" and then sells is equal to the calculated difference between the estimated carbon stock and the imagined baseline scenario. Both variables are, as just seen, extremely difficult or even impossible to establish. Most importantly, however, **no actual reduction of atmospheric $CO_2$ has taken or will take place**: Instead, the credits constitute no

[126] Ole Mertz et al, 'Uncertainty in establishing forest reference levels and predicting future forest-based carbon stocks for REDD+' (2018) 13 Journal of Land Use Science 1; Kate Dooley, 'Misleading numbers — The case for separating land and fossil-based carbon emissions' (2014) <https://www.fern.org/publications-insight/misleading-numbers-the-case-for-separating-land-and-fossil-based-carbon-emissions-578/> accessed 18 February 2021.
[127] Ibid 4.
[128] This can easily be confirmed with a look into the required "data sets" of the relevant methods offered by Verra, the certifying organization of Shell' "voluntary carbon credits"; See eg Verra, 'VMD0001 Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools' (2013) 12-21 <https://verra.org/wp-content/uploads/2017/11/VMD0001v1.1.pdf> accessed 23 December 2020.
[129] Kate Dooley, 'Misleading numbers — The case for separating land and fossil-based carbon emissions' (2014) 4 <https://www.fern.org/publications-insight/misleading-numbers-the-case-for-separating-land-and-fossil-based-carbon-emissions-578/> accessed 18 February 2021; P Falkowski et al, 'The Global Carbon Cycle: A Test of Our Knowledge of Earth as a System' (2000) 290 Science 293.
[130] See e.g. Verra, 'VMD0001 Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools' (2013), 3-4 <https://verra.org/wp-content/uploads/2017/11/VMD0001v1.1.pdf> accessed 23 December 2020.
[131] See e.g. Verra, 'VM0005 Methodology for Conversion of Low-productive Forest to High-productive Forest' (2013) 10 <https://verra.org/wp-content/uploads/2017/10/VM0005v1.2.pdf> accessed 23 December 2020.

more than a claim that, in absence of the project, even more $CO_2$ would have entered the atmosphere.
It should be added that **no universally recognized method for the calculation of either of the variables even exists**. Falkowski et al state: "Direct determination of changes in terrestrial carbon storage has proven extremely difficult."[132] Verra - the organization that certified the "carbon credits" that Shell bought and promotes - offers the project developers a broad variety of methods that they can choose from, and even allows them to write their own method.[133] According to Gifford, "project developers often choose an accounting protocol that addresses a desired outcome, rather than altering a project to meet specific protocol guidelines."[134] While third parties are contracted to "verify" the process, **this does not even remotely constitute an independent audit**: First, these third parties are paid by the project managers; Second, there is **no objective, recognized system of auditing, no oversight, no enforceable rules of professional conduct, and no sanctions**; Third, the employed "methods" are no more than vague guidance documents, and thus not auditable.[135] This means that there is no credible external, independent control of the amount and credibility of the "carbon credits" claimed. In this sense Haya et al find that "[...]offsets are better understood as a way for [...] emitters to invest in an incentive programme that achieves difficult-to-estimate emission reductions, than as accurately quantified tons of reductions."[136] This has already been discussed in detail in section A.6.

Given all these difficulties, it is not at all surprising that the **EU never allowed forest "credits" to "compensate" for actual, physical $CO_2$-pollution from fossil fuels**.[137] Within the EU Emissions Trading System (EU ETS), one European Emission Allowance (EUA) has to be paid for each ton of $CO_2$. The EU never recognized "credits" from forest "compensation" projects as equivalent to an EUA (whereas it did accept, until the end of 2020, international credits from many other types of international projects). Similarly, the Kyoto Protocol did not allow "avoided deforestation" to be taken into account when calculating emission reductions.[138] A "carbon credit" that cannot actually be used to pay one's $CO_2$-pollution debt cannot be assumed to be worth much.

[132] P Falkowski et al, 'The Global Carbon Cycle: A Test of Our Knowledge of Earth as a System' (2000) 290 *Science* 293.
[133] Verra, 'Methodologies' <https://verra.org/methodologies/> accessed 23 December 2020.
[134] Lauren Gifford, '"You can't value what you can't measure": a critical look at forest carbon accounting' (2020) 161 Climatic Change 291, 296.
[135] Ibid 298.
[136] Barbara Haya et al, 'Managing uncertainty in carbon offsets: insights from California's standardized approach' (2020) 20 Climate Policy 1112.
[137] European Commission, 'Use of international credits' <https://ec.europa.eu/clima/policies/ets/credits_en> accessed 23 December 2020.
[138] Wim Carton et al, 'Negative emissions and the long history of carbon removal' (2020) 11 WIREs Clim Change e671, 5.

The **fact that the "carbon credits" bought and promoted by Shell are worthless also follows from a simple price comparison**: According to Shell, 1 cent is sufficient to "offset" the damages from $CO_2$-pollution caused by burning 1 litre of fuel. This would mean that the **cost of 1 tonne of $CO_2$-pollution is, according to Shell, a mere 3,57 euros**.[139] However, in academic literature **the actual "social cost of carbon"** - i.e., the economic damage caused by $CO_2$-pollution - **is estimated at 340 Euros per tonne of $CO_2$**.[140] This means that the actual cost of $CO_2$-pollution per litre Benzine (E95) is 1 Euro, not 1 cent. Consequently, the **true cost of $CO_2$-pollution is about 100 times higher than what Shell claims it is**. In the EU, the only officially recognized carbon credit standard is the just-mentioned EUA. The current spot market price for one EUA is 33 Euros.[141] This is much less than what the social cost of $CO_2$-pollution is according to science, but still **ten times higher than what Shell paid for its "voluntary carbon credits."**

The extremely low price of the "voluntary carbon credits" indicates that the **market does not believe that the fundamentals of this financial product are sound**. "Voluntary carbon credits" do not represent any actual value: The claimed "$CO_2$ compensation" exists on paper only, but these claims are not backed up by any actual, physical removals of carbon from the atmosphere. In that they are **comparable to the "sub-prime" (or "junk") mortgages** that triggered the financial crisis more than a decade ago.

### B.6.3. Tree-planting projects generate hypothetical, future $CO_2$-reductions only

The other promoted "compensation" mechanism is the planting of trees. Depending on the tree, the relevant take-up of $CO_2$ from the atmosphere will occur only far in the future, decades from now (20-60 years, depending on the tree).[142] In any case, **Shell itself states that there is no "certified method" to calculate that $CO_2$ take-up**.[143] Consequently such "compensation" activities constitute, at best, "hypothetical" future $CO_2$ reductions of unknown quantity. Whether these hypothetical, future $CO_2$-reductions will actually be realized in the future is highly uncertain, as the climate crisis destroys the ability of forests to take up $CO_2$-pollution.[144]

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[139] 1 litre Benzine (E95) = 2,8 kg $CO_2$ → 357 litres = 1t$CO_2$ → cost of 1t$CO_2$-pollution: 3,57 euros; For this calculation we used the same data as Shell: <www.$CO_2$emissiefactoren.nl/lijst-emissiefactoren/#brandstoffen_voertuigen> accessed 23 December 2020.

[140] Katharine Ricke et al, 'Country-level social cost of carbon' (2018) 8 Nature Climate Change 895 (417$ per ton of $CO_2$; Euro/Dollar exchange rate 6 January 2021).

[141] Spot market, EEX, 5 Jan 2021.

[142] European Academies Science Advisory Council (EASAC), 'Negative emission technologies: What role in meeting Paris Agreement targets?' (2018) 17 <easac.eu/fileadmin/PDF_s/reports_statements/Negative_Carbon/EASAC_Report_on_Negative_Emission_Technologies.pdf> accessed 1 October 2020.

[143] Shell, 'Hoe werkt $CO_2$-compensatie?' <www.shell.nl/consumenten/$CO_2$-neutraal-rijden/hoe-werkt-$CO_2$-compensatie.html> accessed 23 December 2020.

[144] See section B.2.

### B.6.4. Conclusion

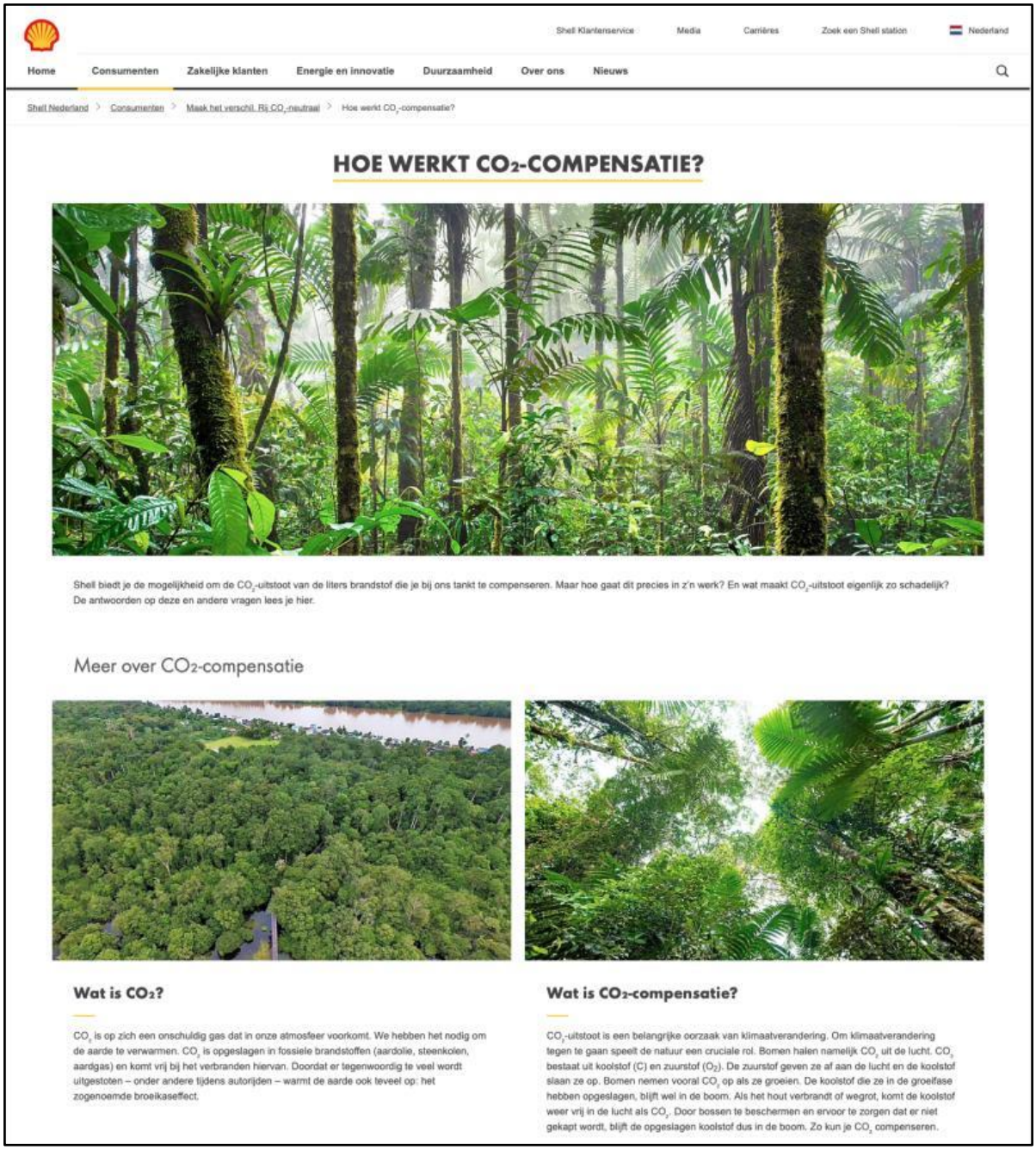
Carbon credits from projects allegedly protecting forests merely produce $CO_2$-reductions on paper ("calculatory" $CO_2$-reductions). They do not lead to actual, present-day physical reductions of $CO_2$-pollution. Tree-planting projects merely produce $CO_2$-reductions that are hypothetical and uncertain. Calculatory and hypothetical $CO_2$-reductions are, from a purely factual perspective, not commensurable with real, physical $CO_2$-pollution from fossil fuels. **Suggesting that calculatory or hypothetical $CO_2$-reductions from "compensation" projects could "neutralize" actual, physical, present-day $CO_2$-pollution from fossil fuels is factually incorrect**, and thus misleading.

## B.7. The promotion of "$CO_2$ compensation" with positive images of nature creates the false impression that the product would have a positive environmental impact, even though it logically cannot achieve that

### B.7.1. Introduction

The product "$CO_2$ compensation" is sold in combination with Shell's fossil fuels. Shell promotes it with numerous images of pristine, intact forests. This creates the visual impression that the product has a positive impact on the environment. This, however, is a logical impossibility: **As "$CO_2$ compensation" promises the "neutralization" of $CO_2$-pollution from Shell's fossil fuels, its environmental effect can, at best, be neutral, but never positive**.

According to Article 2 MRC, environmental claims must not contain pictures or suggestions that may mislead the consumer concerning the environmental aspects of the promoted product. In this section, different insights from the field of marketing and psychology are used to show that the **visual cues used in Shell's advertisement campaigns** give the consumer the impression that the promoted product **"$CO_2$ compensation"** has a **positive impact** on the environment, which is factually incorrect.




*Shell promotes the product "$CO_2$ compensation" with images of lush, green and pristine forests. This website will be analyzed in detail in section C.3.*

### B.7.2. The use in advertisement of images and colours associated with nature can create the misleading impression that the promoted product is environmentally friendly

The idea of **"greenness"** is usually conveyed through the use of a natural setting or nature imagery so as to create an **implicit visual association** with nature.[145] In their studies on the effects of nature imagery, Hartmann and colleagues found that the mere presence of a nature-evoking picture in advertising incites a sensation among consumers similar to feelings experienced from actual contact with nature.[146]

As the virtual sensation appeals to consumers' affinity for nature, an advertisement featuring imagery of nature evokes a **larger sense of environmental friendliness** among consumers than the same advertising without imagery of nature.[147]

According to the explanatory notes to Article 2 MRC, it is the **"overall impression created by the advertising message"** that must be taken into account in determining whether an environmental claim is misleading.[148] This acknowledges that besides mere statements, pictures or suggestions, factors such as the use of certain colours can create a misleading impression. In that sense, a recent study carried out by Kim et al shows that consumers associate the colour grey in advertisements with environmental unfriendliness, while they associate the colour green with **environmental friendliness**.[149] This is why companies like Starbucks and Whole Foods Market signal their "eco-friendliness" using a green logo.[150]

As they trigger implicit ecological inferences in green advertising, it is hardly surprising that visual cues such as images of pleasant natural scenery and the colour green are very often **misused** in advertising to induce **false perceptions of a brand's or product's environmental friendliness** - a practice often referred to as **"executional greenwashing"**[151] - thereby misleading the average consumer.[152] Hence why Article

[145] Béatrice Parguel et al, 'Can evoking nature in advertising mislead consumers? The power of 'executional greenwashing' (2015) 34 Int. J. Advert. 110.
[146] Ibid; Patrick Hartmann et al, 'Nature imagery in advertising. Attention restoration and memory effects' (2013) 32 Int. J. Advert. 183.
[147] Desirée Schmuck et al, 'Misleading Consumers with Green Advertising? An Affect–Reason–Involvement Account of Greenwashing Effects in Environmental Advertising' (2018) 47 J. Advert. 127,
[148] Stichting Reclame Code, 'Code for Environmental Advertising (MRC)' <www.reclamecode.nl/nrc/code-for-environmental-advertising-mrc/?lang=en> accessed 18 January 2021.
[149] Dongjae Lim et al, 'Colour effects in green advertising' (2020) 44 Int. J. Consum. Stud. 552
[150] Nina Mazar & Chen-Bo Zhong, 'Do green products make us better people?' (2010) 21 Psychological Science 494; Dongjae Lim et al, 'Colour effects in green advertising' (2020) 44 Int. J. Consum. Stud. 552,
[151] Béatrice Parguel et al, 'Can evoking nature in advertising mislead consumers? The power of 'executional greenwashing' (2015) 34 Int. J. Advert. 110. Doi: 10.1080/02650487.2014.996116.
[152] Desirée Schmuck et al, 'Misleading Consumers with Green Advertising? An Affect–Reason–Involvement Account of Greenwashing Effects in Environmental Advertising' (2018) 47 J. Advert. 127; Dongjae Lim et al, 'Colour effects in green advertising' (2020) 44 Int. J. Consum. Stud. 552

2 MRC explicitly acknowledges non-textual cues as a possible tool to mislead consumers regarding the environmental aspects of a product.

### B.7.3. In the consumer's perception, misleading non-verbal claims about a product's environmental friendliness cannot be "corrected" by accompanying text

The above-mentioned findings stipulate that visual cues can evoke a larger sense of environmental friendliness among consumers. In addition, research has indicated that visual cues can **override** a consumer's **rational, critical evaluation** towards the created (greenwashing) perception.[153] A study by Parguel et al shows that the greenwashing-effect of non-textual environmental cues persists for non-expert consumers even when the correct textual information about the product's poor environmental performance is provided.[154] Grebmer finds that the provision of "specific [textual] information has (if at all) only a minor influence on the product environmental friendliness evaluation" for consumers with low environmental consciousness.[155]

Consumers with high environmental consciousness are initially skeptical towards visual (environmental) cues, but this skepticism disappears if textual information is provided in addition.[156] According to Grebmer and Diefenbach this may be explained by the fact "that the use of pictorial information is 'justified' by verbal cues, thus rendering pictorial information as a more trustworthy source of information."[157] The presence of text accompanying the visual cues thus serves as a **mental shortcut** signalling the **correctness of the information**.[158] The consumer processes the textual information **heuristically** (i.e., by means of mental shortcuts) instead of rationally. He or she evaluates its "truthiness" (i.e., the subjective impression of its truth value) and not its truthfulness. This hardly comes as a surprise given that the average consumer does not - and, as was previously argued in section A.4.3., cannot be expected to - have the necessary scientific and technical knowledge to critically evaluate the veracity of complex environmental performance information.

In sum, visual cues in advertisements such as nature imagery or the colour green evoke a sense of environmental friendliness among consumers. On top of that, these visual cues will often override consumers' ability to critically assess the advertisements

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[153] Ibid.
[154] Béatrice Parguel et al, 'Can evoking nature in advertising mislead consumers? The power of 'executional greenwashing' (2015) 34 Int. J. Advert. 110..
[155] Carmen Grebmer & Sarah Diefenbach, 'The Challenges of Green Marketing Communication: Effective Communication to Environmentally Conscious but Skeptical Consumers' (2020) 4 Designs 25, 13,
[156] Ibid.
[157] Ibid.
[158] Carmen Grebmer, 'The Challenge of Green Marketing Communication: Consumer Response to Communication Channel in Environmental Friendliness Perceptions and Product Evaluation' (Dphil thesis, University of Munich 2020) 116-117, 127-128.

in question, even when the advertisement does not merely provide visual cues, but also textual information about the product's (poor) environmental performance. Such visual cues therefore have the potential to mislead consumers about the environmental aspects of the advertised product.

### B.7.4. "$CO_2$ compensation" can logically never be environmentally friendly

Shell claims that "$CO_2$ compensation" neutralises the $CO_2$-pollution from its fossil fuel products. Even if we assume for a moment that "$CO_2$ compensation" could actually achieve this outcome, the product can at best compensate or neutralise the negative environmental effect of $CO_2$-pollution, but never create a positive environmental effect. **As it merely compensates for the harm caused by $CO_2$-pollution from fossil fuels,** the product **"$CO_2$ compensation" cannot, for logical reasons, be an environmentally friendly product**.

### B.7.5. Shell's promotion of the product "$CO_2$ compensation" create the misleading impression that the product is environmentally friendly

Shell's promotion of the product "$CO_2$ compensation" makes extensive use of nature imagery. At Shell's website, the green colours and the images of pristine forests stand out immediately. According to the studies mentioned above, the presence of nature-evoking pictures in advertising incites a sensation among consumers similar to feelings experienced from actual contact with nature. Consequently, advertisements featuring nature imagery evoke a **sense of environmental friendliness** among consumers.[159]

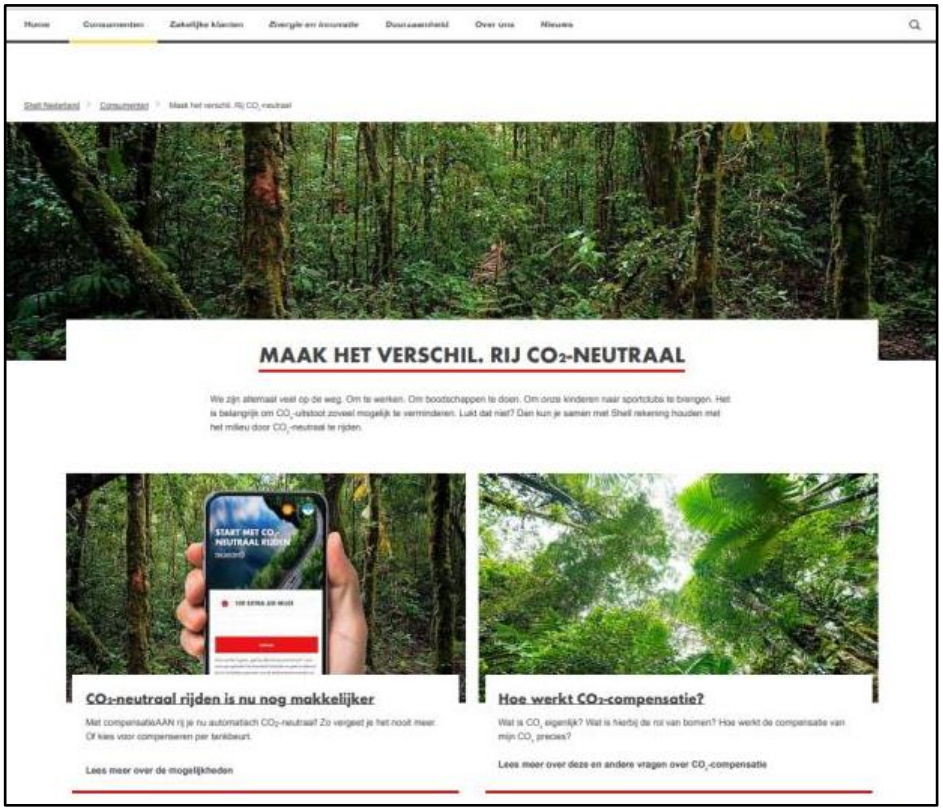
It follows from this that the overall impression created by Shell - by means of nature imagery and the colour green - will lead the average consumer to associate the product "$CO_2$ compensation" with a sense of **environmental friendliness.** As "$CO_2$ compensation" merely compensates for the harm caused by $CO_2$-pollution from fossil fuels and thus cannot deliver a positive environmental contribution, the product "$CO_2$ compensation" is, even in a scenario of 100% carbon neutralisation, not an environmentally friendly product. The impression created by Shell is thus necessarily and under all circumstances misleading for the average consumer.

To illustrate how Shell misleads the consumer about the product "$CO_2$ compensation" by means of nature imagery, we contrast Shell's main campaign website "Maak het verschil. Rij $CO_2$-neutraal" with an altered version that correctly represents the product (see images on page 63).

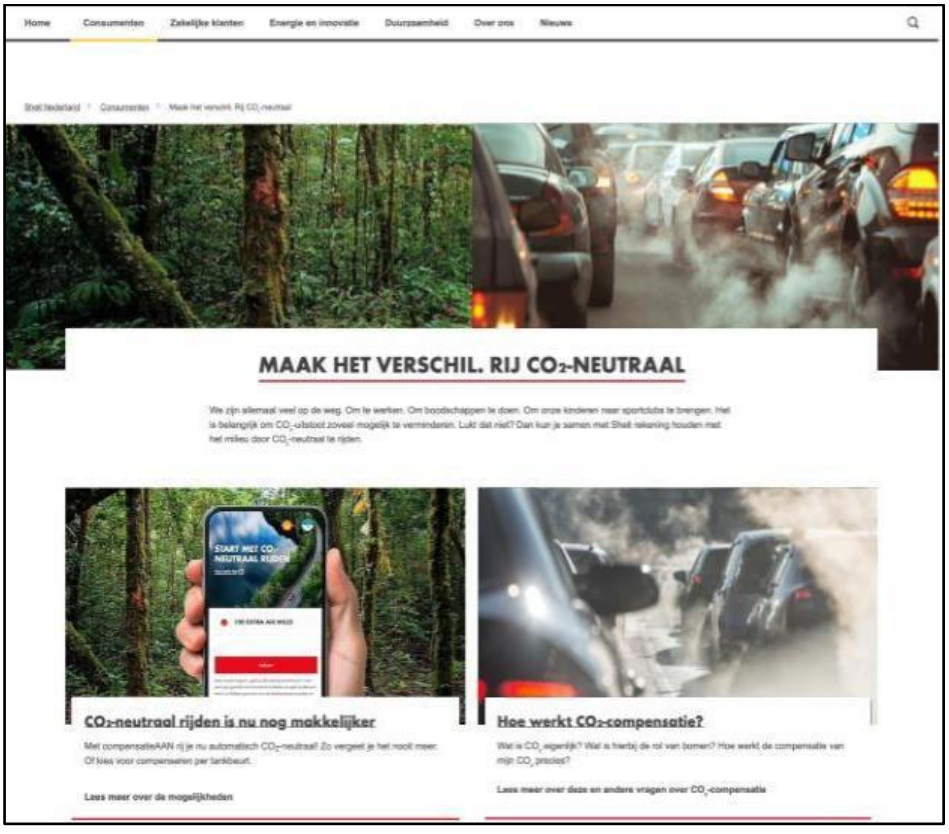
[159] Desirée Schmuck et al, 'Misleading Consumers with Green Advertising? An Affect–Reason–Involvement Account of Greenwashing Effects in Environmental Advertising' (2018) 47 J. Advert. 127

The top image on the next page shows the actual webpage. Nature imagery and the colour green completely dominate it. As explained above, the average consumer will associate this with the positive sensation of being in nature and, consequently, the website will evoke a sense of environmental friendliness. However, because the product "$CO_2$ compensation" can logically never be environmentally friendly, the visual impression is misleading.

The bottom image shows a version of the website that employs visual cues in a way that is actually representative of how the product "$CO_2$ compensation" is supposed to work. It shows images of forests, but also images of the pollution from cars that the forests are allegedly "compensating" for. The positive environmental impression of the nature imagery is contrasted with the negative environmental impression from the car pollution.




*Original website: It misleads because it shows positive nature imagery only. It thereby suggests a beneficial impact of the product on the environment, which is factually incorrect.*




*Altered website: The visual impression is less misleading than the original, as it balances the forest images with images of pollution from cars. This is representative of the mechanism that Shell promotes as "$CO_2$ compensation."*

### B.7.6. Conclusion

To conclude, the colours and images used in Shell's campaigns promoting "$CO_2$ compensation" are intended to evoke a sense of environmental friendliness among the average consumers. Given that "$CO_2$ compensation" merely compensates for the harm caused by $CO_2$-pollution from fossil fuels and thus cannot deliver a positive environmental contribution, this product is, even in a scenario of 100% carbon neutralisation, not an environmentally friendly product. Therefore, **the colours and images used in Shell's campaigns mislead the average consumer about the environmental aspects of the product "$CO_2$ compensation".**

Promoting the "neutralization" of $CO_2$-pollution by means of positive environmental visual cues constitutes, in essence, a form of **(misleading) double counting of the product's benefits**: one and the same activity is deceptively promoted as both "compensating" for the harm caused by $CO_2$-pollution from fossil fuels, and as delivering a positive environmental contribution.

# Why People Harm the Environment Although They Try to Treat It Well: An Evolutionary-Cognitive Perspective on Climate Compensation



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Anthropogenic climate changes stress the importance of understanding why people harm the environment despite their attempts to behave in climate friendly ways. This paper argues that one reason behind why people do this is that people apply heuristics, originally shaped to handle social exchange, on the issues of environmental impact. Reciprocity and balance in social relations have been fundamental to social cooperation, and thus to survival, and therefore the human brain has become specialized by natural selection to compute and seek this balance. When the same reasoning is applied to environment-related behaviors, people tend to think in terms of a balance between "environmentally friendly" and "harmful" behaviors, and to morally account for the average of these components rather than the sum. This balancing heuristic leads to compensatory green beliefs and negative footprint illusions—the misconceptions that "green" choices can compensate for unsustainable ones. "Eco-guilt" from imbalance in the moral environmental account may promote pro-environmental acts, but also acts that are seemingly pro-environmental but in reality more harmful than doing nothing at all. Strategies for handling problems caused by this cognitive insufficiency are discussed.

**Keywords: climate change, moral accounting, balancing heuristic, natural selection, compensatory green beliefs, negative footprint illusion, evolutionary-cognitive perspective**

*Shell's promotion of "$CO_2$ compensation" with positive environmental images exploits a well-known cognitive bias of consumers, the "balancing heuristic".*[160]

[160] Patrik Sörqvist and Linda Langeborg, 'Why people harm the environment although they try to treat it well: An evolutionary-cognitive perspective on climate compensation' (2019) 10 Frontiers in Psychology Article 348.

# C. Misleading claims in Shell's campaign "Rij $CO_2$-neutraal"

Part B showed that the promotion of the product "$CO_2$ compensation" misleads consumers per definition because the promoted activity does not, and cannot achieve what is promised. **Part C zooms in on the concrete execution of Shell's "Rij $CO_2$-neutraal" campaign.** It will be shown that they contain numerous misleading claims about "$CO_2$ compensation." Part C thereby confirms the findings of Part B, and **illustrates the deceptive overall character of Shell's promotion of "$CO_2$ compensation."**

## C.1. Overview of the campaign

In 2019, Shell rolled out the "Rij $CO_2$-neutraal" ("Drive $CO_2$ neutral") campaign, starting with the Netherlands in April and gradually expanding the campaign to other countries such as the UK and Canada. This complaint deals with the Dutch version of the campaign only.

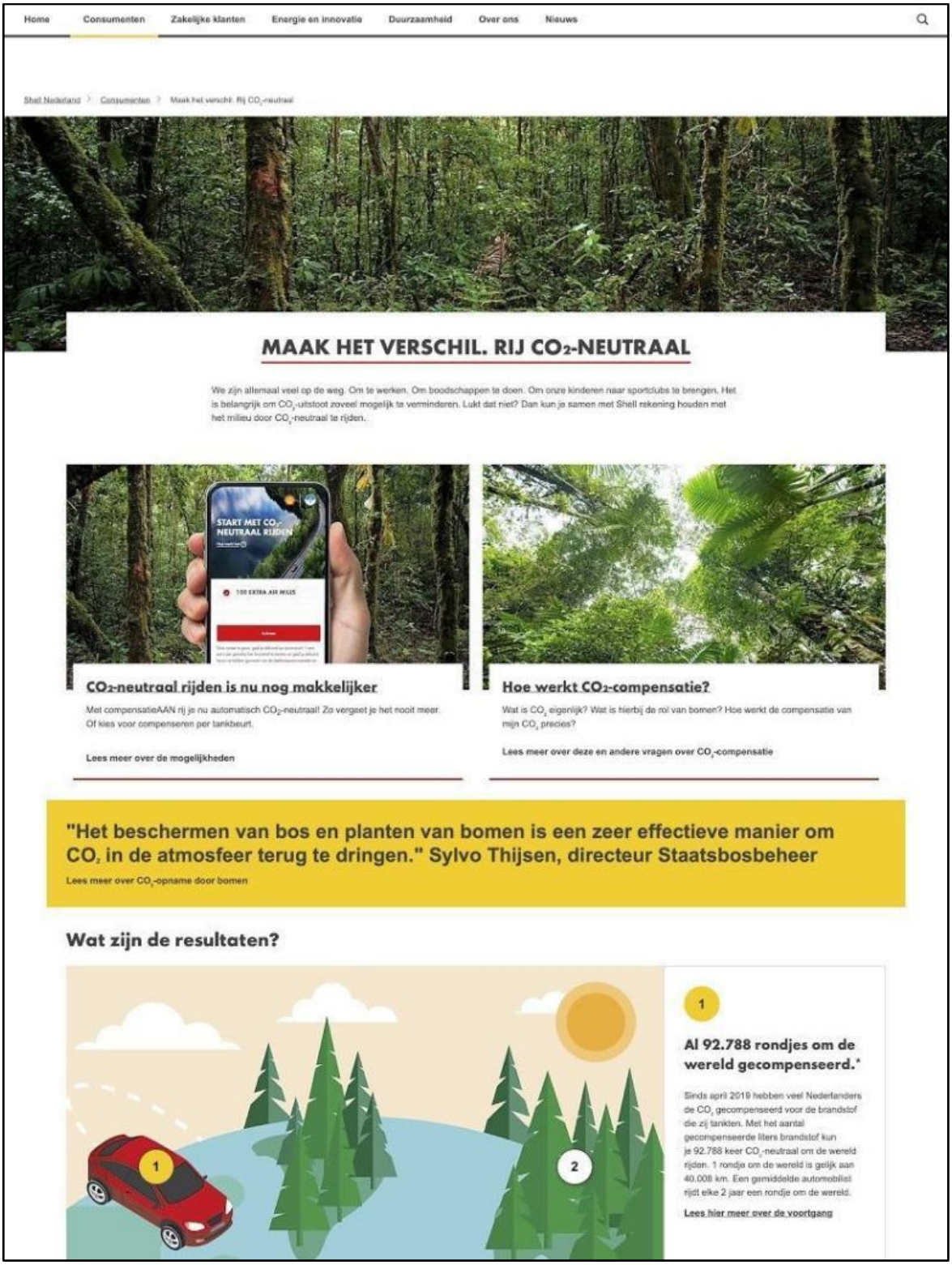
The campaign promotes the product "$CO_2$ compensation": Shell customers can allegedly "compensate" for the $CO_2$-pollution from their fossil fuel use by paying €0.01 per litre of fuel. To do so, Shell buys so-called "voluntary carbon credits" from international REDD-projects. In the Dutch campaign, Shell promotes two REDD-projects: The Cordillera Azul project in Peru and the Katingan Mantaya-project in Indonesia.[161]

The promoting slogan and images of nature and forests are seen at almost every location of Shell. On Shell's website, the campaign has a prominent place and its own section. Additionally, videos were produced for distribution via social media. Recently, Shell introduced "CompensatieAAN", where customers automatically pay for the "compensation" whenever they buy Shell's fossil fuels. Shell also promotes its campaign via Branded Content within newspapers, such as the NRC Handelsblad.[162]

This section **provides an in-depth analysis** of the advertisement campaign regarding its **violations of the Nederlandse Reclame Code.** The analysis is guided by **the two core sites of the campaign on the Shell webpage:** The start page that provides the general overview of the campaign and the website that contains all technical explanations in the form of a FAQ. By focusing on these two websites which lie at the heart of the promotional campaign, the analysis covers, in essence, all types of claims that Shell makes within the context of the campaign. Therefore, **the findings apply to all forms of advertising that use the same claims**. Moreover, for reasons of clarity a number of "physical" advertisements are analysed as well at the end of this part.

[161] Shell, 'Rij $CO_2$-neutraal met compensatieAAN' <https://www.shell.nl/consumenten/$CO_2$-neutraal-rijden/mogelijkheden-$CO_2$-neutraal-rijden.html> accessed 26 February 2021.
[162] See e.g. NRC Branded Content Podcast with Shell, '$CO_2$ compensatie is reductie op een andere plek' <https://www.nrc.nl/brandedcontent/shell/podcast-$CO_2$-compensatie-is-reductie-maar-dan-op-een-andere-plek> accessed 5 April 2021

## C.2. Website “Maak het verschil. Rij $CO_2$-neutraal”[163]




*The main website of the “Maak het verschil. Rij $CO_2$-neutraal” campaign.*

[163] Shell, ‘Maak het verschil. Rij $CO_2$-neutraal.’ <https://www.shell.nl/consumenten/$CO_2$-neutraal-rijden.html> accessed 26 February 2021.

### C.2.1. The overall impression: Six different images of pristine forests, interposed with the message “Make the difference. Drive $CO_2$-neutral” (“Maak het verschil. Rij $CO_2$-neutraal”)

*The advertisements on this website violate Article 8(2)(a) and (b) NRC, misleading about the nature of the product “$CO_2$ compensation”, as well as about its advantages and risks.*

The **website is dominated by positive visual environment cues**: Five different photographs of lush, pristine forests, plus one image of a cartoon forest and a cartoon car. Against this visual background, the product “$CO_2$ compensation” is promoted. According to the Explanation of Article 1 NRC, “[t]he total message plays a role in assessing the element of commendation. Not only is the text a matter of concern, but also size, lay-out, use of colour and so forth.” Article 1 MRC holds that “pictures or suggestions [...] may mislead the consumer concerning environmental aspects of the products.” Consequently, both text and images must be taken into account in evaluating the overall potential of the website to mislead consumers.

As already discussed in section B.7, images of pristine forests are perceived by consumers as positive environmental cues. The website manifestly seeks to establish an association between the product “$CO_2$ compensation” and the positive environmental cues. By prominently featuring exclusively positive environmental images **it creates the impression that the promoted product has a positive environmental impact**.

**The overall impression that the website conveys leads the consumer to a factually incorrect conclusion**, for at least two main reasons:
1) By the logic of the promoted product itself, the best possible outcome of consuming the product “$CO_2$ compensation” is the “neutralization” of the $CO_2$-pollution from fossil fuels. This means that the net effect of consuming fossil fuels in conjunction with the product “$CO_2$ compensation” can, logically, never be positive. However, this is precisely what the use of exclusively positive environmental images imply. The images do not represent a negative effect that is offset by a positive effect, but the positive effect alone. It thereby **suggests that the net environmental effect of “$CO_2$ compensation” is positive, which is logically impossible**, thereby by necessity factually incorrect, and thus misleading. Promoting the (alleged) avoidance of environmental harm as environmentally beneficial is like promoting the repayment of a debt as generosity.

2) Creating the impression that the product “$CO_2$ compensation” has a positive environmental impact is also misleading because environmentally harmful pollution from fossil fuels includes, but is not limited to $CO_2$-pollution. Fossil fuel combustion in

motor vehicles also causes pollution by particulate matter (PM), nitrogen oxides (NOx), unburnt hydrocarbons (HC) and carbon monoxide (CO).[164]

While the text of the website mostly refers to $CO_2$-pollution, the images reference the environment as a whole. Studies show clearly that incorrect visual environmental information is not sufficiently corrected by accompanying text.[165] This is particularly the case given that the accompanying text does not make the fact explicit that the promoted product does not address most forms of fossil fuel pollution. Consumers can be assumed to know that vehicles using fossil fuels cause air pollution, but they cannot be expected to know the specific chemical composition of that pollution. **The overall impression of the website is that the product "$CO_2$ compensation" is "neutralizing" all environmental harm from driving with fossil fuels, which is not the case**.

[164] European Commission, 'Air pollution from the main sources - Air emissions from road vehicles' <https://ec.europa.eu/environment/air/sources/road.htm> accessed 26 February 2021.
[165] Beatrice Parguel et al., 'Can evoking nature in advertising mislead consumers? The power of "executional greenwashing"' (2015) 34 International Journal of Advertising 107, 113 and 126.

### C.2.2. “Rij $CO_2$-neutraal” (= “Drive $CO_2$ neutral”)


*The claim “Rij $CO_2$-neutraal.”*

*The claim violates Article 8(2)(a) and (b) NRC, misleading about the existence and the nature of the product “$CO_2$ compensation”, as well as about its advantages and risks. The claim also violates Article 8(3)(c) NRC, omitting essential information about the product “$CO_2$ compensation.”*

The statement “Rij $CO_2$-neutraal” forms the core message of the campaign. The statement is (1) misleading about the functionality of the activities that are promoted as “$CO_2$ compensation”. Moreover, it (2) misleads about the harmful climate effects of greenhouse gas pollution from fossil fuels.

1) This statement misleads consumers about the functionality of the activities that are promoted as “$CO_2$ compensation”. More specifically, the claim must be viewed as (a) factually incorrect because it asserts that the physical $CO_2$-pollution is “neutralised”, which is untrue in an actual, physical sense; and/or (b) misleading by omitting material information necessary for the consumer to correctly process the information.

a) In a physical sense, paying for a “voluntary carbon credit” does not “neutralise” the $CO_2$-pollution from driving. This has been explained in sections B.1., B.2., B.3., and B.6. The **car still emits $CO_2$-pollution, and this pollution still enters the carbon cycle. No equivalent amount of $CO_2$ is physically removed from the atmosphere.** The “voluntary carbon credit” does not pay for, or represent an activity that actually takes up $CO_2$ from the atmosphere, and thus could “neutralise" present-day $CO_2$-pollution. Instead, the “voluntary carbon credit” from the projects promoted by Shell represent only a calculatory emission reduction. However, consumers are liable to understand the “neutralization” of $CO_2$-pollution from driving in a physical sense, not in a mere calculatory sense. Consequently, it is factually incorrect to claim that the consumer could “drive $CO_2$-neutral” when they pay for the product “$CO_2$ compensation”, and therefore the claim is misleading. While the average consumer may be assumed to understand the principles of “$CO_2$ compensation” (including the basic operation of “voluntary carbon credits"), **she cannot be assumed to know that “voluntary carbon credits" represent only calculatory, not physical, $CO_2$-pollution reductions**. See on this also section A.4.3.

Moreover, the Reclame Code Commissie has established in its recent decision against Nestlé that the average consumer decides on the basis of single marketing claims, and cannot be expected to make in-depth research about the workings and nature of the product.[166] When taken at face value, the statement "Rij $CO_2$ neutraal" is highly misleading, as the **consumer will expect real, physical emission reductions to "offset" the $CO_2$-pollution from Shell's fossil fuels**. However, "voluntary carbon credits" do not fulfil that promise.

Because Shell's "$CO_2$ compensation" product does not deliver real, physical emission reductions, the statement also conflicts with the guidelines of the Dutch Autoriteit Consument en Markt (ACM) on sustainability claims. These state in regard to "compensation":

"*Het bedrijf moet kunnen aantonen dat de uitstoot van de gereden kilometers daadwerkelijk volledig is gecompenseerd, zodat consumenten kunnen blijven vertrouwen op de claim."*[167]
("The company must be able to show that the emissions of the driven kilometres have been fully compensated for, so that consumers can keep trusting the claim").

Given that the "voluntary carbon credits" do not lead to an actual, physical compensation of the $CO_2$-pollution from their fossil fuel products, Shell cannot meet this requirement set by the ACM.

b) Even a mere calculatory emissions reduction can be assumed only if an expansive set of conditions is met. This is demonstrated in section B.3. Among these conditions, the most important are additionality, absence of leakage and permanence. Scientific literature shows that these conditions are difficult, if not impossible to meet. **In order to be truthful, the advertising would have to inform the consumer about the conditionality that the product "$CO_2$ compensation" is subject to.** However, the advertising does the opposite: Shell plainly claims that "$CO_2$ compensation" would allow the consumer to "drive $CO_2$-neutral", without making any qualification. This constitutes an **absolute statement.** According to the Explanation to Article 3 MRC, absolute statements must be supported by "heavily convincing evidential material." However, no such evidence is provided. In fact, no such evidence **can** be provided, as "$CO_2$ compensation" is extremely controversial, and its effectiveness highly doubtful. This is also the case for the specific "offsetting" projects that Shell promotes. Neither the "Cordillera Azul" nor the "Katingan Mentaya" projects meet the criteria, and

[166] Verbied Fossiele Reclame, 'Reclame Code Commissie: Neste mag z'n diesel in advertenties niet 'renewable' noemen' (2021) <https://verbiedfossielereclame.nl/neste-mag-diesel-niet-renewable-noemen-reclame-code-commissie/> accessed 26 February 2021.
[167] Autoriteit Consument en Markt (ACM) 'Leidraad Duurzaamheidsclaims' (2021) <https://www.acm.nl/sites/default/files/documents/leidraad-duurzaamheidsclaims.pdf> accessed 26 February 2021.

**certainly not in any way that would even remotely justify the absolute claims made on the website**. See on this in more detail section B.3

2) The alleged "neutralization" of $CO_2$-pollution is manifestly promoted in the context of the climate crisis. The website itself explicitly addresses the climate emergency. An **average consumer will assume that purchasing the product "$CO_2$ compensation" will neutralise all harmful climate effects of her consumption of fossil fuels**. In other words, it is suggested that, from a climate perspective, driving and paying for "$CO_2$ compensation" is equivalent to not driving at all. This is incorrect, for the following reasons:

First, as already mentioned, "$CO_2$ compensation" does not actually neutralise the physical emissions from fossil fuel consumption. The climate harm from their consumption is not avoided.

Second, **climate science does not actually view commercial "carbon offsetting" as an alternative to avoidable emission cuts.** While "negative emission technologies" are necessary to meet the Paris goal, they do not constitute an alternative to emission cuts. Instead, they must be adopted in addition to emission cuts. Moreover, the continued effectiveness of forests as carbon sinks with increasing climate change is uncertain. "$CO_2$ compensation" is therefore not an appropriate way of addressing the harm from fossil fuels. The promotion of "$CO_2$ compensation" incorrectly portrays the climate harm from fossil fuels as "fixable", even though this is not the case. This has already been explained in sections B.1., B.2. and B.4.

### C.2.3. “Maak het verschil” (= “Make the difference”)

*The claim violates Article 2 MRC, misleading about the environmental benefits of paying for the product “$CO_2$ compensation.”*

“Make the difference” is a factually incorrect statement, for at least two important reasons:

1) As already discussed, “voluntary carbon credits” represent calculatory $CO_2$-pollution reductions only, but not real, physical $CO_2$-pollution reductions. Consequently, paying for certificates does not actually lead to a physical reduction of emissions. **From a climate perspective, there is no difference between driving with and driving without payment for “$CO_2$ compensation.”** Consequently, paying for the product “$CO_2$ compensation” does not make a difference from a climate perspective. This has been explained in section B.6.

2) Shell buys the “voluntary carbon credits” in bulk, independent from the actual consumer demand for the product “$CO_2$ compensation”. **Shell employs these credits to calculate its own $CO_2$ footprint**, as it states in the terms and conditions (“Algemene voorwaarden $CO_2$-compensatieprogramma 2020”: *“De door Shell gekochte compensatie credits kunnen door Shell worden gebruikt om de jaarlijkse voortgang ten opzichte van haar netto $CO_2$-voetafdruk te berekenen.” / “The offset credits purchased by Shell can be used by Shell to calculate its annual progress against its net carbon footprint”*). This implies that the **total number of certificates bought is determined by the $CO_2$ footprint that Shell seeks to achieve, and not dependent on consumer demand** for the product “$CO_2$ compensation.” Consumer’s choice to pay for “$CO_2$ compensation” does not affect the total, calculatory $CO_2$-pollution reduction that Shell generates by acquiring certificates. Paying for the product “$CO_2$ compensation” does thus not make a difference in the total number of certificates acquired by Shell.

### C.2.4. “We zijn allemaal veel op de weg. [...]” (= "We are all on the road a lot. [...]”)

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|---|
| The website is headed by the following statement: *“We zijn allemaal veel op de weg. Om te werken. Om boodschappen te doen. Om onze kinderen naar sportclubs te brengen. Het is belangrijk om $CO_2$-uitstoot zoveel mogelijk te verminderen. Lukt dat niet? Dan kun je samen met Shell rekening houden met het milieu door $CO_2$-neutraal te rijden.”* |
| *"We are all on the road a lot. To work. To run errands. To take our children to sports clubs. It is important to reduce $CO_2$ emissions as much as possible. Not successful? Then, together with Shell, you can take the environment into account by driving in a $CO_2$-neutral way."* |

*The claim encourages an avoidable environmentally unfriendly behaviour, and therefore conflicts with Article 11 MRC.*

The statement aims to portray $CO_2$-pollution as unavoidable, suggesting that it is necessary for work, for shopping and for taking care of children. This is a factually incorrect statement, as all of these activities can be, and are often, conducted without $CO_2$-pollution: **cycling and walking, electric cars and trucks, public transport like trains, trams and buses constitute fully equivalent alternatives**. **The advertisement incorrectly portrays avoidable harmful behaviour as unavoidable**. This has already been addressed in section B.5.

### C.2.5. Disclaimer

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|---|
| **"Shell heeft een reeks analogieën ontwikkeld om klanten te helpen beter te begrijpen hoe koolstof wordt opgenomen en opgeslagen met behulp van de natuur. De analogieën worden gebruikt voor illustratieve doeleinden. Shell heeft uiterste zorg besteed aan de analogieën om te verzekeren dat de gegevens juist en nauwkeurig zijn. De cijfers worden gebruikt op een niet technische manier om de omvang van koolstofopslag te visualiseren. De gemiddelde boom wordt gedefinieerd als een boom met een diameter van 20 cm op borsthoogte. Jongere bomen bevatten minder koolstof dan oudere en een grotere meer dan een kleinere. De berekening van de gemiddelde vastlegging is bepaald op basis van 3.000.000.000.000 bomen (Crowther T. W., 2015) op de planeet, die samen 400 Giga ton koolstof bevatten (Erb, 2017). De gemiddelde boom bevat daarmee 0,48 t $CO_2$. Er wordt gerekend met 40.008 km voor een rondje om de wereld, met een gemiddeld verbruik van 1 liter brandstof per 14 kilometer. Cijfers van april 2019 tot en met januari 2021 gemeten op Shell-stations in eigendom."*[168] |
| *Shell has developed a series of analogies to help customers better understand how carbon is absorbed and stored using nature. The analogies are used for illustrative purposes. Shell has taken the utmost care in the analogies to ensure that the data is correct and accurate. The numbers are used in a non-technical way to visualize the extent of carbon storage. The average tree is defined as a tree with a diameter of 20 cm at chest height. Younger trees contain less carbon than older trees and a larger one more than a smaller one. The calculation of the average fixation has been determined on the basis of 3,000,000,000,000 trees (Crowther TW, 2015) on the planet, which together contain 400 Gigatons of carbon (Erb, 2017). The average tree therefore contains 0,48 t $CO_2$. It is calculated with 40,008 km for a round the world, with an average consumption of 1 litre of fuel per 14 kilometers. Figures from April 2019 to January 2021 measured at Shell-owned stations.* |

*The claim violates Article 8(3)(c) NRC, as it omits essential information about the functionality of the product $CO_2$-"compensation". The claim also breaches Article 8 MRC, which requires that "quotations from, and reference to scientific works shall be representative and verifiably correct."*

The disclaimer sketched out by Shell on its website attempts to provide evidence that the product of "$CO_2$-compensation" is backed by scientific research. This is not the case. Moreover, the disclaimer makes reference to two scholarly works: 1) Crowther TW, 2015; and 2) Erb, 2017. The **absolute statements picked up by Shell from these two studies and included into the disclaimer are in fact contested**, and both studies clearly identify the limitations of their conclusions.

[168] Shell, 'Maak het verschil. Rij $CO_2$ Neutraal'<https://www.shell.nl/consumenten/$CO_2$-neutraal-rijden.html> accessed 19 February 2021.

Firstly, Shell refers to 'Mapping Tree Density at a Global Scale' by Thomas Crowther as a basis for its calculations: "[T]he calculation of the average fixation has been determined on the basis of 3,000,000,000,000 trees."[169] Stating the findings of this study in absolute terms is misleading, because it fails to address the limitations of said study. **Consumers will certainly skip past reading a dense 13-page report on spatially continuous maps of terrestrial biosphere density**. We will spare you from doing so as well, and provide you with the key issues. Indeed, the study revealed a positive effect of tree density on plant carbon storage (P=0,001). However, it states that the **strength of the relationship is weak ($r^2$ =0,14)**. This is crucial to understand. Statistically, an $r^2$ value of 0,14 means that **only 14% of the observed variation can be explained by the model's outputs**. The study itself rightfully makes this limitation clear to the reader, and explains that the low R-squared level reflects "the vast array of local ecological forces that can obscure [carbon storage] global trends."[170] Generally, a high R-square value of above 0,6 (60%) is required for studies in the 'pure science' field to be considered robust.[171] Even if climate change-related fields are held at a lower threshold for R-square values than "pure science", **it is misleading to refer to findings of this calibre without any mention of the limitations and the high variation level**.

Secondly, Shell refers to Erb, 2017 when stating the global carbon storage of "400 Gigatons of carbon" in trees. Again, reference to this study in absolute terms raises the same concerns as before. The study finds that vegetational carbon stocks play a key role in the climate system. However, Erb highlights in its findings that "the magnitude, patterns and uncertainties of carbon stocks and the effect of land use on the stocks **remain poorly quantified.**"[172] Although the study aims to make a positive contribution to the poorly quantified and understood global carbon stocks, its conclusion is a rather bleak view on forest carbon potential. **Despite the optimism of Shell on its $CO_2$ "compensation" projects, the studies it cites are much more pessimistic.** Erb states: **"**[e]fforts to raise biomass stocks are **currently verifiable only in temperate forests**, **where their potential is limited**. And **"large uncertainties hinder verification in the tropical forest,** where the largest potential is located." By quoting only the 400 Gigaton carbon storage, Shell shares a small portion of the bigger picture of the role of carbon stocks.

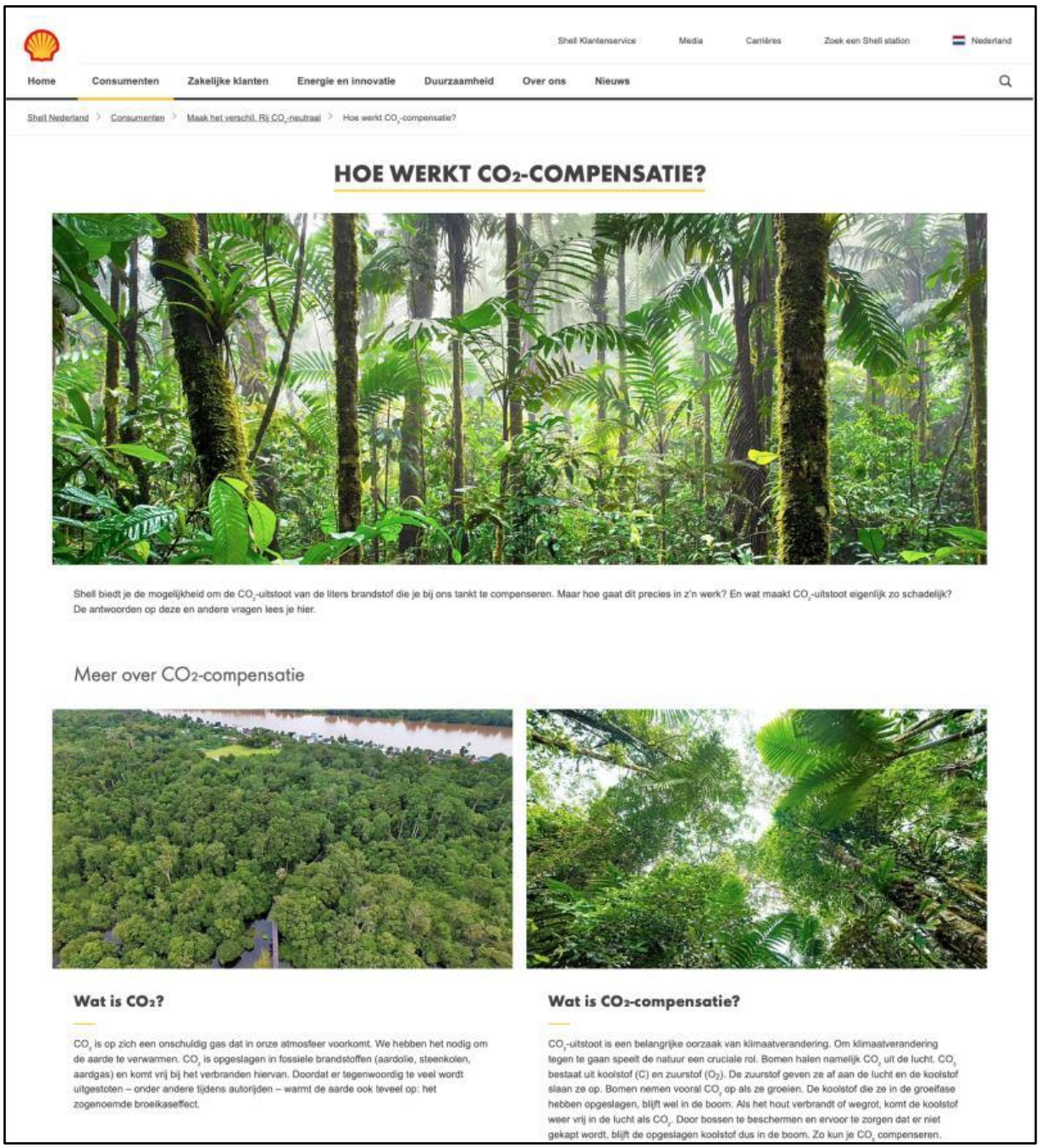
The disclaimers should above all bring forward the uncertainty of the $CO_2$-"compensation", rather than emphasizing and framing the strengths of scientific

[169] Thomas W. Crowther et al, 'Mapping tree density at a global scale' (2015) 525 Nature 201, Doi: 10.1038/nature14967.
[170] Ibid 204.
[171] Michael S. Lewis-Beck, Alan Bryman & Tim Futing Liao, 'R-Squared', in Michael S. Lewis-Beck (ed) *The SAGE Encyclopedia of Social Science Research Methods* (2004),.
[172] Karl-Heinz Erb, Thomas Kastner, Christoph Plutzar et al., 'Unexpectedly large impact of forest management and grazing on global vegetation biomass' (2018) 553 Nature 73, Doi: 10.1038/nature25138.

studies in a way that misinterprets the findings. The omission of this crucial information is a violation of Article 8(3)(c) NRC, as it omits essential information about the functionality of the product $CO_2$- “compensation”.

## C.3. Website “Hoe werkt $CO_2$-compensatie?”[173]

The website contains a general website body and an FAQ, each containing numerous misleading claims and omissions of essential information.




*The website “Hoe werkt $CO_2$-compensatie?”*

[173] Shell, ‘$CO_2$ neutraal rijden. How werkt $CO_2$ Compansatie?’ <https://wcww.shell.nl/consumenten/$CO_2$-neutraal-rijden/hoe-werkt-$CO_2$-compensatie.html> accessed 26 February 2021.

## C.3.1. Website body

### C.3.1.1. "$CO_2$ in and of itself is an innocent gas"

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|---|
| *"Wat is $CO_2$? $CO_2$ is op zich een onschuldig gas dat in onze atmosfeer voorkomt. We hebben het nodig om de aarde te verwarmen. $CO_2$ is opgeslagen in fossiele brandstoffen (aardolie, steenkolen, aardgas) en komt vrij bij het verbranden hiervan. Doordat er tegenwoordig te veel wordt uitgestoten – onder andere tijdens autorijden – warmt de aarde ook teveel op: het zogenoemde broeikaseffect."* |
| *"What is $CO_2$? $CO_2$ in itself is an innocent gas that occurs in our atmosphere. We need it to warm the earth. $CO_2$ is stored in fossil fuels (oil, coal, natural gas) and is released when it is burnt. Because too much is emitted nowadays - for example while driving a car - the earth also heats up too much: the so-called greenhouse effect."* |

*The claim violates Article 8(3)(c) NRC and Article 2 MRC, obscuring the decisive difference between fossil $CO_2$-pollution and biotic $CO_2$, and thereby trivializing the dangerous effects of $CO_2$-pollution from fossil fuels.*

The statement is misleading, obscuring the difference between naturally occurring $CO_2$ ("biotic $CO_2$") and $CO_2$-pollution from fossil fuels ("**fossil $CO_2$-pollution**").[174] Different to what the statement suggests, **fossil $CO_2$-pollution does not occur naturally in the atmosphere**. Only biotic $CO_2$ occurs naturally in the atmosphere. Different to biotic $CO_2$, **fossil $CO_2$-pollution is not "innocent" at all: Instead, it is the main driver of dangerous climate disruption**.[175] Different to what the statement suggests, **there is no level of fossil $CO_2$-pollution in the atmosphere "necessary" to warm the planet**. All life on earth has developed very well without it.

The statement belittles and **trivializes the extremely harmful nature of $CO_2$-pollution from fossil fuels**. Fossil $CO_2$-pollution and the climate crisis are directly related, as the IPCC Report clearly states[176] and which is no longer disputed in the international scientific community.

[174] Paul Falkowski et al, 'The Global Carbon Cycle: A Test of Our Knowledge of Earth as a System' (2000) 290 Science 291, Doi: 10.1126/science.290.5490.291.
[175] IPCC, 'Climate Change Synthesis Report' (2014), Summary for Policymakers, 3. <https://www.ipcc.ch/report/ar5/syr/> accessed 26 February 2021.
[176] Ibid 3, Figure 1.

## C.3.2. FAQs

### C.3.2.1. "Shell wants to play an active role in accelerating the Dutch transition from fossil to renewable energy sources"

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|---|
| *FAQ 1: "Wat is het effect van $CO_2$-uitstoot op klimaatverandering?" - "Doordat er steeds meer broeikasgassen zoals $CO_2$ vrijkomen, is er sprake van opwarming van de aarde en klimaatverandering. Om dit tegen te gaan, wil Shell een actieve rol spelen in de versnelling van de Nederlandse transitie van fossiele naar hernieuwbare energiebronnen."* |
| *FAQ 1: "What is the effect of $CO_2$ emissions on climate change?" - "As more and more greenhouse gases such as $CO_2$ are released, global warming and climate change are taking place. To counteract this, Shell wants to play an active role in accelerating the Dutch transition from fossil to renewable energy sources."* |

*The statement conflicts with Article 2 MRC, misleading consumers about the "contribution of the advertiser to maintaining and promoting a clean and safe environment in general."*

The statement is misleading because it understates Shell's responsibility for climate change while overstating its contribution to the energy transition. Fossil fuel products are the main cause of $CO_2$-pollution, and **Shell is among the top-ten $CO_2$-polluters of the planet**.[177] Over the course of the entire history of humanity, only five legal entities have emitted more than Shell.[178]

While Shell claims that it wants to play an active role in accelerating the energy transition, a different picture is drawn by Shell's investment flows. According to its own annual report, Shell's investment in fossil fuel exploration and production continues to belittle its investments in "new energies"[179] ($28 billion (approximately €23 billion) vs $1-2 billion (approximately €824 million- €1.6 billion)).[180] **"New energies" thus make up a minuscule 5% of Shell's investment portfolio.** By contrast, the **Netherlands seek to reach a renewable energy share of 14% by 2020 and to reach 27% by 2030**.[181] This means that Shell does not play an active role in the acceleration of the Dutch energy transition - the opposite is true. **The numbers clearly show that Shell is holding back the energy transition in the Netherlands**. Given that the investment

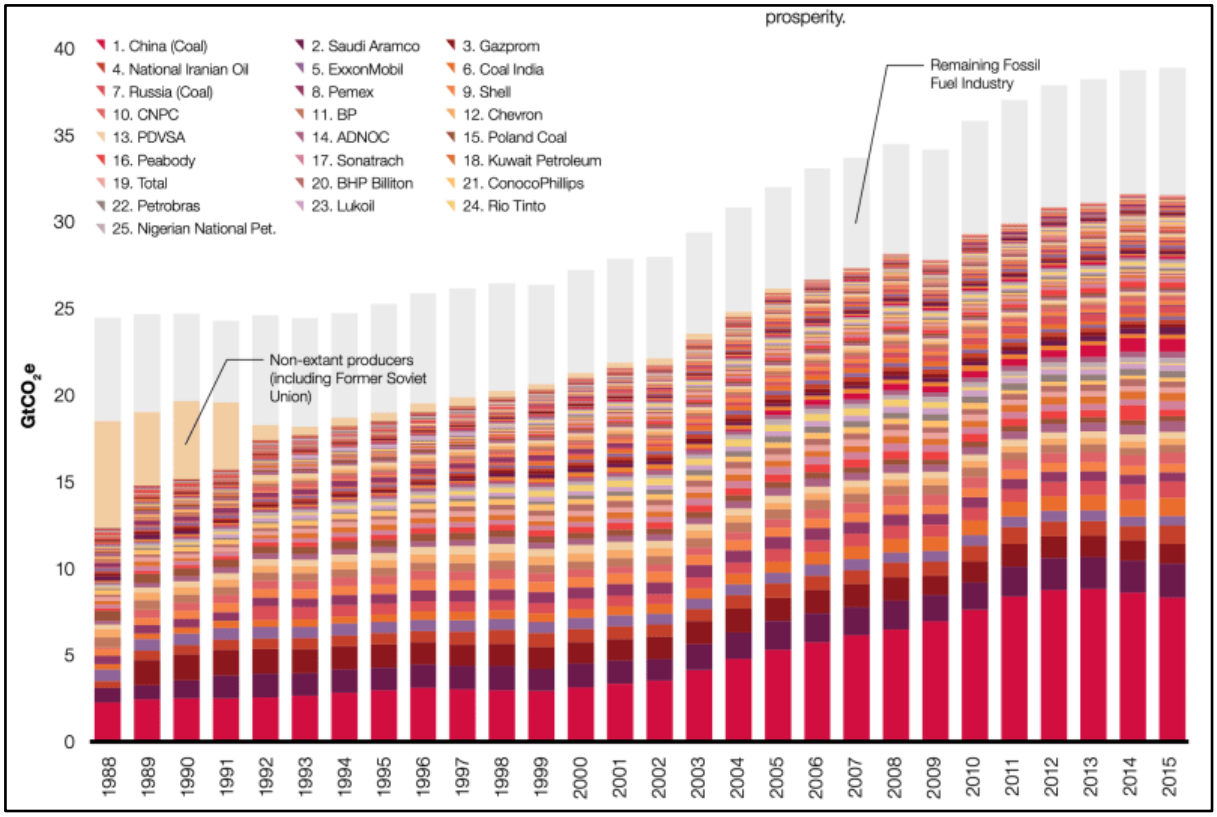
[177] Climate Disclosure Project, 'Carbon Majors Report' (2017) <https://climateaccountability.org/carbonmajors.html> accessed 26 February 2021.
[178] Richard Heede, 'Tracing anthropogenic carbon dioxide and methane emissions to fossil fuel and cement producers, 1854–2010' (2014) 122 Climatic Change 229, Table 3.
[179] "New energies" is itself a misleading term, as it includes renewable energy as well as fossil fuel.
[180] Shell, "Annual Report and Accounts for the year ended December 31, 2019' (2020) 40 and 95 <https://reports.shell.com/annual-report/2019/> accessed 1 December 2020.
[181] Ministry of Economic Affairs and Climate Policy, 'Integrated National Energy and Climate Plan 2021-2030' (2019) 9 and 12 <https://ec.europa.eu/energy/sites/ener/files/documents/nl_final_necp_main_en.pdf> accessed 4 March 2021.

numbers just cited describe the actual choices Shell made regarding its future energy output (as opposed to empty advertising promises), it is factually incorrect to claim that "Shell wants to play an active role in accelerating the Dutch transition from fossil to renewable energy sources". The **investment numbers prove irrefutably that Shell does not, and *does not want to* accelerate the energy transition:** Otherwise, it would not keep investing in the expansion of fossil fuel facilities but start to shift its core business towards other areas.

The claim that Shell is not truly dedicated to a fast and effective energy transition is also supported by an event that occurred in December of 2020: A group of **top executive employees of Shell left the company in frustration with the senior management, which is unwilling to commit to meaningful climate action**.[182] One of them is cited with the statement that "[p]art of the frustration is that you see the potential, but the mindset isn't there among senior leaders for anything radical."[183] This directly highlights the disparity between Shell's pledges to renewable energies and the Paris Agreement and its true actions up to this date.

[182] RTLnieuws, 'Leidinggevenden bij Shell vertrekken om discussie over tempo vergroening' *RTLnieuws* (8 December 2020) <https://www.rtlnieuws.nl/economie/bedrijven/artikel/5202031/shell-managers-leidinggevenden-weg-energietransitie-groene> accessed 26 February 2021.

[183] Anjli Raval & Leslie Hook, 'Several clean energy leaders leave company with only weeks before strategy announcement' *Financial Times* (8 December 2020) <https://www.ft.com/content/053663f1-0320-4b83-be31-fefbc49b0efc> accessed 26 February 2021.




*Shell is among the top-ten $CO_2$-polluters of the planet.*[184]

| Entity | 2010 emissions $MtCO_2e$ | Cumulative 1854–2010 $MtCO_2e$ | Percent of global 1751–2010 |
|---|---|---|---|
| 1. Chevron, USA | 423 | 51,096 | 3.52 % |
| 2. ExxonMobil, USA | 655 | 46,672 | 3.22 % |
| 3. Saudi Aramco, Saudi Arabia | 1,550 | 46,033 | 3.17 % |
| 4. BP, UK | 554 | 35,837 | 2.47 % |
| 5. Gazprom, Russian Federation | 1,371 | 32,136 | 2.22 % |
| 6. Royal Dutch/Shell, Netherlands | 478 | 30,751 | 2.12 % |
| 7. National Iranian Oil Company | 867 | 29,084 | 2.01 % |
| 8. Pemex, Mexico | 602 | 20,025 | 1.38 % |
| 9. ConocoPhillips, USA | 359 | 16,866 | 1.16 % |
| 10. Petroleos de Venezuela | 485 | 16,157 | 1.11 % |
| 11. Coal India | 830 | 15,493 | 1.07 % |

*Over the history of humankind, only five entities have emitted more greenhouse gases than Shell did.*[185]

[184] Climate Disclosure Project, 'Carbon Majors Report' (2017) <https://climateaccountability.org/carbonmajors.html> accessed 26 February 2021.
[185] Richard Heede, 'Tracing anthropogenic carbon dioxide and methane emissions to fossil fuel and cement producers, 1854–2010' (2014) 122 Climatic Change 229, Table 3.

C.3.2.2. “Make an important contribution today to controlling $CO_2$ emissions”

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| *“Deze oplossingen, ook wel nature-based solutions genoemd, kunnen vandaag al een belangrijke bijdrage leveren aan het beheersen van de $CO_2$-uitstoot. Meer informatie hierover vind je bijvoorbeeld in een rapport van het Intergovernmental Panel on Climate Change (IPCC), het klimaatpanel van de Verenigde Naties.”* |
| *”These solutions, also known as nature-based solutions, can already make an important contribution today to control $CO_2$ emissions. More information can be found, for example, in a report by the Intergovernmental Panel on Climate Change (IPCC), the United Nations climate panel.”* |

*The claim violates Article 2 MRC, misleading about the environmental benefits of paying for the product “$CO_2$ compensation.”*

The claim is **factually incorrect because the projects financed by Shell only lead to calculatory, not physical reductions of $CO_2$-pollution**. They are therefore not able to “control” present-day $CO_2$ emissions. This has already been explained in section B.6.

*The claim also breaches Article 8 MRC, which requires that “quotations from, and reference to scientific works shall be representative and verifiably correct.” This is not the case: The IPCC report stands for the opposite of what Shell suggests in its claim.*

The **IPCC report certainly does not recommend the payment to forest-related projects as an alternative to reducing $CO_2$-pollution from individual transport**. Instead, the IPCC urges a cut of GHG emissions by 45% within this decade.[186] **Massive reforestation is necessary *in addition* to massive cuts in fossil $CO_2$-pollution**.[187] This has already been explained in section B.4.

It is a true misrepresentation to cite the IPCC report for support of Shell’s “$CO_2$ compensation” product, sold in conjunction with fossil fuels, when the **IPCC report actually shows the need for a major cut in $CO_2$-pollution and sheds doubt on the functioning of $CO_2$ “offsetting” mechanisms**.

[186] Intergovernmental Panel on Climate Change (IPCC), ‘Global Warming of 1.5°C’ (2018) 12.
[187] Ibid 17.

C.3.2.3. ”$CO_2$-neutral driving is about offsetting $CO_2$ emissions that cannot be reduced or prevented.”

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| *FAQ 2: “Wat is $CO_2$-neutraal rijden eigenlijk?” - “Bij $CO_2$-neutraal rijden gaat het om het compenseren van $CO_2$-uitstoot die niet of moeilijk kan worden verminderd of voorkomen.”* |
| *FAQ 2: ”What exactly is $CO_2$-neutral driving?” - ”$CO_2$-neutral driving is about offsetting $CO_2$ emissions that cannot be reduced or prevented.”* |

*The claim conflicts with Article 11 MRC, which states that “advertising messages shall not set as an example environmentally unfriendly behaviour that is avoidable, nor shall such behaviour be encouraged.”*

The statement is misleading because it **implies that some $CO_2$-pollution from individual transport is unavoidable. This is factually incorrect.** While certain activities cannot yet be fully conducted completely free of $CO_2$-pollution, this is not the case for individual transport. Already today, individual transport can be conducted completely free from $CO_2$-pollution. **Cycling and walking, electric cars, public transport like trains, trams or buses, constitute fully equivalent alternatives**. This has already been explained in section B.4.

C.3.2.4. ”We support compensation projects that compensate $CO_2$ emissions by planting trees that absorb $CO_2$ directly from the air.”

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| *“Wij steunen bijvoorbeeld compensatieprojecten die $CO_2$-uitstoot compenseren door het planten van bomen die direct $CO_2$ opnemen uit de lucht.”* |
| *”For example, we support compensation projects that compensate $CO_2$ emissions by planting trees that absorb $CO_2$ directly from the air.”* |

*The claim violates Article 8(2)(a) and (b) NRC, misleading about the nature of the product “$CO_2$ compensation” as well as Shell’s fossil fuel products, as well as about their advantages and risks. It further violates Article 8(3)(c) NRC, as it omits essential information about the functionality of the product “$CO_2$ compensation”.*

The claim is factually incorrect because the planting of trees may, even in theory, only begin locking in carbon far in the future, instead of instantaneously, whereas the harm from present fossil fuel use occurs in the present. Moreover, there is no mention of the partial return of the captured $CO_2$ back into the atmosphere, which is ultimately a relatively large portion of the total uptake. Thus, only the positive contribution of trees is presented, and only half of the whole picture is shown to the consumer. Uncertain future benefits are not equivalent to present harm in their evaluation of what can legitimately be promised. **“Compensation” of present $CO_2$-pollution by the planting of trees is therefore logically not possible.** This has already been explained in section B.1.

*The claim also violates Article 8(2)(a) NRC, misleading about the nature of the product “$CO_2$ compensation”. It further violates Article 8(3)(c) NRC, as it omits essential information about the functionality of the product “$CO_2$ compensation”.*

Furthermore, the claim is misleading because the **consumer’s payment for Shell’s “compensation” product does not actually finance the planting of trees**. As Shell itself explains, its tree-planting project with Staatsbosbeheer is unrelated to the “Drive $CO_2$-neutral” product.[188] The “voluntary carbon credits” Shell acquires for its “compensation” product is generated for allegedly protecting existing forests. This has already been explained in section B.6.

[188] Shell, ‘Samen planten we bomen’ <https://www.shell.nl/energy-and-innovation/make-the-future/cleaner-mobility/samen-planten-we-bomen.html> accessed 26 February 2021.

### C.3.2.5. ”Why does Shell offer $CO_2$-neutral driving? … We offer it because reducing $CO_2$ emissions is important to limit climate change”

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|---|
| *FAQ 4 - “Waarom biedt Shell $CO_2$-neutraal rijden aan?” - “Wij bieden dit aan omdat het terugdringen van $CO_2$-uitstoot van belang is om klimaatverandering te beperken. Om de klimaatverandering aan te pakken, moeten we de $CO_2$ die door menselijke activiteiten wordt veroorzaakt terugdringen. Shell wil hier een rol in spelen en haar klanten daarbij keuzes bieden.”* |
| *FAQ 4 - ”Why does Shell offer $CO_2$-neutral driving?” - “We offer it because reducing $CO_2$ emissions is important to limit climate change. To tackle climate change, we need to reduce $CO_2$ caused by human activity. Shell wants to play a role in this and offer its customers choices.”* |

*The claim violates Article 8(2)(a) and (b) NRC, misleading about the nature of the product “$CO_2$ compensation” as well as Shell’s fossil fuel products, as well as about their advantages and risks. It further violates Article 8(3)(c) NRC, as it omits essential information about the functionality of the product “$CO_2$ compensation”.*

The claim is misleading because the **physical emissions from fossil fuel use are not actually reduced by a payment to a forest project operator**. This leads, at best, only to calculatory “compensation” for $CO_2$-pollution. Driving with or without payment for Shell’s compensation project makes no difference while the consumer believes he or she is doing something *positive* for the environment. This has already been explained in section B.5.

C.3.2.6. - "We can use nature to absorb $CO_2$"

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| *"We kunnen de natuur gebruiken om $CO_2$ op te nemen. Dit kan bijvoorbeeld door ontbossing tegen te gaan en nieuwe bomen te planten. Bomen helpen namelijk om de hoeveelheid $CO_2$ in de atmosfeer, die zorgt voor klimaatverandering, te verminderen."* |
| *"We can use nature to absorb $CO_2$. This can be done, for example, by combating deforestation and planting new trees. Trees help to reduce the amount of $CO_2$ in the atmosphere, which causes climate change."* |

*The claim violates Article 8(3)(c) NRC, as it omits essential information about the functionality of the product "$CO_2$ compensation".*

The claim that "we can use nature" to clean up Shell's $CO_2$-pollution is not only extremely cynical, but has long been refuted by scientific evidence. Already more than 20 years ago, Falkowski et al stated in Science that "**there is no natural savior waiting to assimilate all the anthropogenic $CO_2$ in the coming century**."[189] And even today, scientists make clear that no technologies, neither human-made nor "nature-based", exist to take the necessary amount of $CO_2$ out of the atmosphere.[190] Being directly contradicted by scientific research, the claim must be considered factually incorrect, and thus misleading.

Moreover, the claim is misleading because, even in theory, forest-related "compensation" is assumed to be effective only if an expansive set of conditions are fulfilled, which are difficult to meet. Whereas **the harm of $CO_2$-pollution is unconditional, the promised benefits of "compensation" are highly conditional**. Logically, a conditional benefit is not equivalent to an unconditional harm; the former cannot "compensate" for the latter. This has already been explained in section B.3. This is not explained to the consumer. The claim is therefore **misleading because the conditions under which the promised effects of the product "$CO_2$ compensation" could - at least in theory - be realized, are not stated**.[191]

[189] P Falkowski et al, 'The Global Carbon Cycle: A Test of Our Knowledge of Earth as a System' (2000) 290 *Science* 293.
[190] Simon Lewis et al., 'Restoring natural forests is the best way to remove atmospheric carbon' (2019) 568 Nature 25
[191] Reclame Code Commissie *Statoil* (2017) 2017/00283.

### C.3.2.7. "What is a $CO_2$ credit?"

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| *FAQ 5: "Wat is een $CO_2$-credit?" - "Een $CO_2$-credit is een certificaat dat aantoont dat 1 ton (ofwel 1.000 kg) $CO_2$-uitstoot is vermeden, of is opgenomen uit de atmosfeer. Een credit kan alleen worden uitgegeven als het is gecontroleerd door een onafhankelijke instantie, en kan maar één keer gebruikt worden."* |
| *FAQ 5: "What is a $CO_2$ credit?" - "A $CO_2$ credit is a certificate that shows that 1 tonne (or 1,000 kg) of $CO_2$ emissions have been avoided, or have been absorbed from the atmosphere. A credit can only be issued if it has been verified by an independent body, and can only be used once."* |

*The claim violates Article 8(2)(a) NRC, misleading about the nature of the product "$CO_2$ compensation". It also violates Article 8(3)(c) NRC, as it omits essential information about the functionality of the product "$CO_2$ compensation".*

The claim is factually incorrect for at least three reasons.

First, **"voluntary carbon credits" do not represent any actual, physical reduction of $CO_2$-pollution**. Instead, they are the result of calculations alone: Consequently, they **should be termed "calculatory" or "paper-only" reductions (as opposed to actual, physical reductions).** This has already been explained in section B.6.

Second, the statement **misleadingly suggests that the $CO_2$ take-up-potential of forests could be measured and established in a precise form**. Such precision is not even remotely possible. As Falkowski et al state: "Direct determination of changes in terrestrial carbon storage has proven extremely difficult."[192] This has already been explained in section B.5.

Third, the statement incorrectly suggests an objective, independent verification. While third parties are indeed contracted to "verify" the process, **this does not even remotely constitute an independent audit**: First, these third parties are paid by the project managers; Second, there is **no objective, recognized system of auditing, no oversight, no enforceable rules of professional conduct, and no sanctions**; Third, the employed "methods" are no more than vague guidance documents, and thus not auditable. This has already been explained in section B.6.

[192] P Falkowski et al, 'The Global Carbon Cycle: A Test of Our Knowledge of Earth as a System' (2000) 290 *Science* 293.

C.3.2.8. “What does cooperation with Staatsbosbeheer mean?”

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|---|
| *FAQ 7: “Wat houdt de samenwerking met Staatsbosbeheer in?” - “Naast de mogelijkheid voor $CO_2$-neutraal rijden, is Shell ook een samenwerking gestart met Staatsbosbeheer. Beide partijen zijn ervan overtuigd dat er een belangrijke rol is weggelegd voor herbebossing, waarmee aanzienlijke hoeveelheden $CO_2$ uit de atmosfeer kunnen worden verwijderd.”* |
| *FAQ 7: “What does cooperation with Staatsbosbeheer mean?” - “In addition to the possibility of $CO_2$-neutral driving, Shell has also started a partnership with Staatsbosbeheer. Both parties are convinced that there is an important role for reforestation, which can remove considerable amounts of $CO_2$ from the atmosphere.”* |

*The claim violates Article 8(2)(a) NRC, misleading about the nature of the product “$CO_2$ compensation”.*

It is not sufficiently clarified that the product “$CO_2$ compensation” has no relation with the cooperation project with Staatsbosbeheer. The website’s constant referral, at this and other places, to that project is liable to **create the incorrect impression that payment for the product “$CO_2$ compensation” would actually support the project with Staatsbosbeheer, which is not the case**. This has already been discussed in section A.5.

*The claim also violates Article 8(3)(c) NRC, as it omits essential information about the functionality of the product “$CO_2$ compensation”.*

Whether forest projects have the effect of “removing” $CO_2$-pollution from the atmosphere is scientifically highly contested. It is also not stated that the “removal” is only a temporary one, whereas emissions from fossil fuels are permanently released into the atmosphere. This has already been explained in sections B.1., B.2. and B.3.

C.3.2.9. “1 extra cent per litre ... covers the $CO_2$ emissions that need to be offset by fuel consumption while driving.”

| |
|---|
| *FAQ 10: “Waarom kost $CO_2$-compensatie 1 cent extra per liter? Is dit genoeg?” - “1 cent extra per liter is gebaseerd op de huidige prijzen voor $CO_2$-credits die op de markt worden verhandeld en dekt op dit moment de $CO_2$-uitstoot die gecompenseerd moet worden door brandstofverbruik tijdens het rijden.”* |
| *FAQ 10: “Why does $CO_2$ offsetting cost 1 cent extra per litre? Is this enough?” - “1 extra cent per litre is based on current prices for $CO_2$ credits traded on the market and currently covers the $CO_2$ emissions that need to be offset by fuel consumption while driving.”* |

*The claim violates Article 8(2)(a) and (b) NRC, misleading about the existence and the nature of the product “$CO_2$ compensation”.*

The statement is misleading because it incorrectly suggests that 1 cent would be sufficient to “offset” the damages from $CO_2$-pollution caused by burning 1 litre of fuel. This is completely misleading, as shown in detail in section B.6.2. To summarize: The **true cost of $CO_2$-pollution is about 100 times higher than what Shell claims it is**. The EUA, the only officially recognized carbon credit standard in the EU, is ten times more expensive than “voluntary carbon credits.” This shows that Shell’s claim is factually incorrect.

## C.4. The promotion of the product "$CO_2$ compensation" at Shell gas stations and other locations

### C.4.1. Promotion of the product "$CO_2$ compensation" at Shell gas stations

Shell promotes the product "$CO_2$ compensation" at its gas stations. It uses the slogans "Doe ook mee. Rij $CO_2$-neutraal" ("Join us. Drive $CO_2$-neutral") and "Maak het verschill. Rij $CO_2$-neutraal" (Make the difference. Drive $CO_2$-neutral"). It has been shown in sections C.2.2. and C.2.3 that these slogans are misleading. To promote the product, Shell employs nature imagery, suggesting that the product has a positive environmental impact. This is factually incorrect, as shown in section B.7.

It should be reiterated that, according to the Reclame Code Commissie, the average consumer is liable to base her decisions on the main marketing claims, and cannot be expected to do significant additional research on the subject. However, even if the consumer were to consult Shell's website to learn more about the product, she would be further misled there. The website contains, as the previous sections have shown, countless factually incorrect and otherwise deceptive marketing claims.


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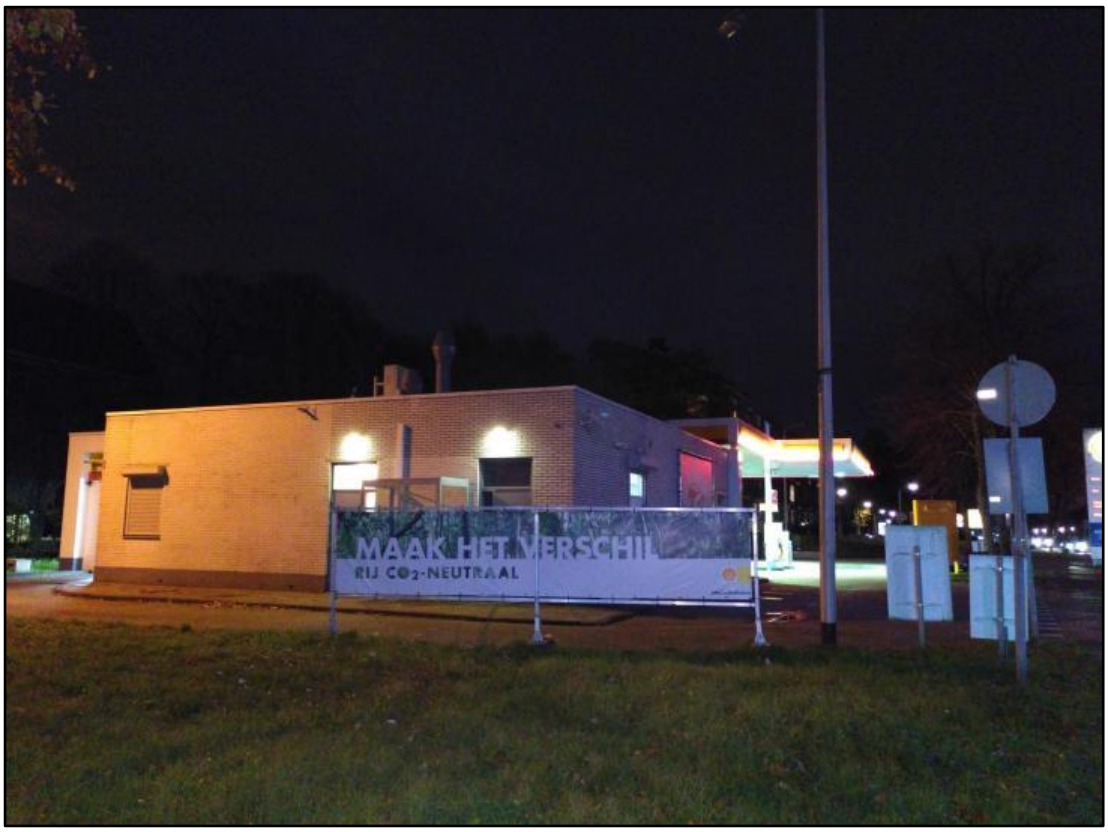


*The promotion of the product "$CO_2$ compensation" at Shell gas stations.*

### C.4.2. Claims on Shell trucks

On its trucks, Shell uses the slogan “Ik ben $CO_2$-neutraal op weg. U ook.” (“I drive $CO_2$-neutral. You too?”) As a factual statement the claim is incorrect, as the truck physically emits $CO_2$-pollution.

The imagery - lush, green forests reaching to the horizon - suggests that the promoted activity is environmentally friendly. As already discussed in section B.7., this is not the case. Even if “$CO_2$ compensation” is taken into account, the environmental effect can, at best, be neutral, but never positive.

The weblink (“www.**shell**.com/**$CO_2$neutraal**”) suggests that Shell is $CO_2$-neutral, which is not the case. As already discussed in section C.3.2.1., **Shell is among the top ten global $CO_2$-polluters**. As shown in the previous sections, Shell’s website contains numerous misleading claims about “$CO_2$ compensation.”


*Don’t follow this misleading Shell truck.*

# D. Conclusion

With this complaint, we are convinced we provide sufficient evidence for our assertion that Shell's advertisement promoting the "offsetting" of $CO_2$-pollution from fossil fuel use is misleading and violates the provisions of the Nederlandse Reclame Code and the Milieu Reclame Code.

Through detailed and meticulous research, we have assembled the scientific evidence proving that "offsetting" mechanisms are unable to neutralize the $CO_2$-pollution from using Shell's fossil fuels in part B of the complaint. **The activities promoted as "compensation" do not physically remove any additional amount of $CO_2$** from the carbon cycle, and certainly do not do so in a permanent, measurable and scientifically certain manner. Convincing consumers to believe that it is possible and easy to erase negative effects of fossil fuel consumption, as Shell does in its "Maak het verschil. Rij $CO_2$-neutraal" campaign is thus misleading. Additionally, we have shown the specific problems of Shell's "offsetting" projects. We adhere to the argumentation of scientists which clearly states that as a society we must focus on emissions reductions. Portraying "offsetting" as an equivalent solution does not stand scientific proof. The complaint does not deny the potentially beneficial effects that trees have on the climate. It shows, however, that the potential quantity of carbon take-up is not only low but also extremely uncertain, while it is very clear by now how much $CO_2$-pollution is caused through the burning of fossil fuels. Many **benefits from "compensation" thus exist only on paper** and make no difference for the concentration of $CO_2$ in our atmosphere. Promoting "compensation" as an activity with positive impacts for forests and the climate by using appealing images of pristine rainforests and undamaged trees, is especially misleading.

In part C, the complaint shows how the specific **claims and images used by Shell in its campaign amount to misleading advertisement** under the Nederlandse Reclame Code and the Milieu Reclame Code. We point out numerous violations against Articles 8(2)(a), (b) and 8(3)(c) NRC, as well as against Articles 2, 3, 8 and 11 MRC.

Overall, the Shell's behaviour in this campaign is highly misleading to its consumers - and the consequences of these undue practices do not stop on the personal level. Deceiving about the true consequences of driving fossil powered vehicles will have consequences for the way in which we as a society engage in urgently needed transformation processes. This is what worries us deeply as young consumers and as responsible citizens of the world of tomorrow.