Climate neutrality claims

How to distinguish between climate leadership and greenwashing

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Abbreviations

CO_2	Carbon Dioxide
GHG	Greenhouse Gas
ITMO	Internationally Transferred Mitigation Outcome
LTS	Long Term Strategy
NDC	Nationally Determined Contribution
PPA	Power Purchase Agreement
PV	Photovoltaic
REC	Renewable Energy Certificate
SBTi	Science Based Target Initiative
UAE	United Arab Emirates
UNFCCC	United Nations Framework Convention on Climate Change

1 Introduction

Since the adoption of the Paris Agreement in 2015, along with steadily increasing awareness of climate change and civil society pressure, "climate neutrality" has become increasingly important in the public debate for consumers, voters, and investors alike. This stems in large part from the Paris Agreement, which set out the goal "to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century" (Article 4.1) (UNFCCC, 2015) in order to "hold the increase in global average temperature to well below 2˚C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5˚C" (Article 2.1.a). To contribute to this overall goal, some countries have set "climate neutrality" targets as part of their "long-term low greenhouse gas development strategies" (Article 14.9). Further, a growing number of companies set climate or carbon neutrality targets or offer "climate or carbon neutral products" – ranging from car fuel to all-inclusive holidays, and from parcel deliveries to flights and train trips.

There are large differences in the transparency of these claims and targets and what they actually mean in terms of GHG impact. Both governments' and companies' climate neutrality targets and claims vary in terms of coverage, target year, and the extent to which offsets and negative emissions are expected to play a role. While some actors provide detailed information on important aspects such as current emissions levels, interim targets, reduction strategies, and – when relevant – what type of offset credits are used, other targets and claims are less clear on such details.

As a result, it is difficult to understand the meaning of climate neutrality targets and their impact on global emission levels. Targets can represent ambitious and Paris-aligned actions, but they may also misrepresent climate action and have no or a negative impact on global emission levels. This paper aims to help observers understand climate neutrality targets and distinguish greenwashing from climate leadership and genuinely ambitious targets. It will identify important aspects that consumers and observers should consider when assessing climate neutrality claims.

2 What types of targets are set?

Over a hundred countries worldwide have or are considering a net-zero target of some sort, as are well over 800 companies (NewClimate Institute, 2020a)[1]. However, countries and companies set different types of targets for different years (Table 1). Understanding what these different types mean is important in order to be able to interpret the climate impact of neutrality targets.

The Intergovernmental Panel on Climate Change (IPCC) (2018) defined **climate neutrality** as the "concept of a state in which human activities result in no net effect on the climate system", in other words: anthropogenic emissions of GHGs are balanced by anthropogenic removals over a certain period. Likewise, **carbon neutrality** means that there is a balance between sources and sinks of carbon dioxide emissions (CO_2). Removals are also referred to as **negative emissions**. If "anthropogenic emissions to the atmosphere are balanced by anthropogenic removals over a specific period", emissions are **net zero** (IPCC, 2018)[2]. This is why climate or carbon neutrality targets are also sometimes referred

[1] Source list is not exhaustive.

[2] Although not highlighted by the IPCC in its definition, to truly have a "net-zero" climate impact, it is important that the permanence of the removals is as least as long lasting as the emissions themselves. The duration which a tonne of CO_2 stays in the atmosphere is heavily influenced by a number of factors including the rate of flows of emissions, sinks, and the growing stock of CO_2 in the atmosphere itself but may last for many thousands of years. Different carbon removal technologies have different degrees of permanence (Jeffery *et al.*, 2020), however it is worth noting that both the potential of natural sinks and their permanence are currently being undermined by climate change itself (Sullivan *et al.*, 2020).

to as ‘net zero targets’ (see Table 1). A **zero emissions** target (without the term “net”) implies that actual (gross) emissions go to zero and there will be no residual emissions that must be compensated.

Further, some companies go beyond “net neutral” targets and claim to be **climate positive** or **carbon negative**, by which they imply their operations lead to more GHG removals than emissions. If truly implemented, this would be aligned with the IPCC (2018) which says net negative emissions are necessary by the second half of the century to limit global warming to 1.5˚C.

In this paper, we generally use the term ‘climate neutrality target’ but the issues we discuss apply to all types of targets.

Table 1: Illustrated selection of climate neutrality targets (not exhaustive)

Category	Targets setter	Target terminology	Target year	Source
Country	Bhutan	Carbon neutral	Achieved	Royal Government of Bhutan (2015)
	Finland	Carbon neutral	2035	Government of Finland (2019)
	New Zealand	Net zero	2050 (tbc)	Government of New Zealand (2019)
	Norway	Carbon neutral	2030	(Norwegian Parliament, 2016)
	Sweden	Carbon neutral	2045	Swedish Ministry of the Environment and Energy (2018)
	Suriname	Carbon negative	Achieved	The Republic of Suriname (2020)
	UK	Net-zero	2050	United Kingdom (2019)
Company	Siemens	Carbon neutral	2030	Siemens (2019)
	Volkswagen	Carbon neutral	2050	Volkswagen (2019)
	SAP	Carbon neutral	2025	SAP (2019)
	RWE	Carbon neutral	2040	RWE (2019)
	Microsoft	Net negative	2030	Microsoft (2020)
Products	DHL / Go Green package delivery	Climate neutral	n/a	Deutsche Post DHL (2020a, 2020b)
	EasyJet / net-zero carbon flights	Carbon neutral	n/a	EasyJet (2020)

3 Climate neutrality targets and their climate impact vary

Siemens (2019), RWE (2019), and Volkswagen (2019) all set 'carbon neutrality targets', which are to be achieved by 2030 (Siemens), 2040 (RWE) and 2050 (Volkswagen). Sweden aims to be carbon neutral by 2045, while the Norwegian parliament adopted a resolution stating that Norway should be carbon neutral by 2035. Based on this information, one may conclude that Siemens set the most ambitious goal of the three companies and Norway of the two countries. However, more information than just the target year is needed. What emissions do their targets cover? How do companies and countries plan to achieve carbon neutrality? Does the company have a strategy in place to reach the target? What shape is the emissions pathway expected to have?

Likewise, it is difficult to understand the meaning and climate implications of carbon neutral products. EasyJet claims its flights are "carbon neutral" and Shell offers its customers the option to buy "carbon neutral" fuel (Easyjet, 2019; Royal Dutch Shell PLC, 2019). Both companies purchase carbon offset credits for example from forestry protection programmes to neutralise CO_2 emissions. Based on these claims, a consumer may think it makes no difference to the climate whether one flies from London to Edinburgh, drives by car, or takes a train. However, one would need to know the amount of emissions associated with all modes of transport, what other climate impacts flying, driving or train travel have, and what is really being done to "compensate" for the emissions produced. Both EasyJet and Shell provide a non-exhaustive list of projects they buy credits from, so customers have an idea of the type of project and where projects are located, but do not know when credits were generated, how many credits the companies bought, and what price they paid per tonne. This makes it difficult to verify whether the companies offset all of the emissions they claim to offset, as well as the quality of carbon offset credits purchased.

The following sub-sections will address questions related to four important variables: scope, approaches to reach the target, decarbonisation trajectory and transparency.

3.1 Summing up: Scope of emissions covered

The scope of countries' and companies' climate neutrality targets vary, do not cover the same activities, and are not directly comparable.

Countries' climate neutrality targets generally cover the "direct" GHGs emitted within national borders corresponding to their GHG inventories, which they are required to compile and report under the United Nations Framework on Climate Change (UNFCCC) and the Paris Agreement Article 7a. These inventories provide an estimate of how many tonnes of different kinds of GHG have been emitted from sources or removed through sinks within a given country's national borders within a certain time frame. The geographic borders of countries mean that these emissions calculations generally do not overlap. The IPCC provides guidance[3] about how to estimate these emissions for different gases and sectors. While many countries set climate neutrality targets that cover all GHGs, some targets cover only CO_2 emissions (e.g. Finland) and New Zealand's climate neutrality target does not cover methane emissions from agriculture and waste (Government of Finland, 2019; Government of New Zealand, 2019).

Most countries' climate neutrality targets do not include "indirect" or "embedded" emissions associated with the production of goods that they import, or emissions from international aviation and shipping. "Embedded" emissions may be significant and often bigger than direct emissions. For example, CO_2 emissions are released when primary forests are cut down to clear land and trees are left to decay or burned. Although deforestation in the EU is negligible, one study for the European Commission found

[3] For all methodology reports published by the IPCC, see: "IPCC Task Force on National Greenhouse Gas Inventories" https://www.ipcc-nggip.iges.or.jp/public/index.html (accessed 9 July 2020).

that if one considers the trees cut down for palm oil, soy, meat, paper, timber, coffee, and other commodities that the EU imports from other countries, the EU was responsible for 10% of global deforestation in 2004 (Cuypers *et al.*, 2013), with a correspondingly large impact on land use change emissions from forest cover loss. These emissions are not accounted for when measuring the achievement of the EU's climate targets under the Paris Agreement.

Companies' carbon footprints are not calculated in the same way as countries', which leads them to set climate neutrality targets that cover a different set of emissions. The GHG Protocol was developed through a collaboration between the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) as a way to help companies calculate their emissions footprint (WRI; WBCSD, 2020). It divides a company's emissions footprint into "direct" scope 1 emissions that come directly from facilities and vehicles controlled by the company; and "indirect" scope 2 and scope 3 emissions. Scope 2 indirect emissions are associated with the generation of electricity, heat, and sometimes cooling that the company consumes, and that they buy from others. Scope 3 emissions are other indirect emissions related to goods and services in a company's supply chain. Scope 3 emissions come from a wide range of activities, from business travel and employee commuting, to the emissions associated with the manufacturing and transportation of capital goods and equipment that a company needs to operate but are produced by others "upstream". Scope 3 emissions also include emissions that may not have occurred yet, but will occur as a result of the products they sell – for example if an oil company sells fuel to someone with a car, the emissions from the car when it is driven are scope 3 emissions from the oil company (in addition to being the scope 1 emissions of the owner of the car). For financial institutions, like banks or pension funds, scope three emissions include the GHGs induced by their investments.

The (in)accessibility of data regarding emission sources that are not directly under the control of a company often means that many companies only keep track of their scope 1 and 2 emissions, often omitting most scope 3 emissions. Scope 3 emissions from business (air) travel are often significant and are more often included in companies' climate neutrality targets than other scope 3 emissions.

Box 1: Microsoft's net negative by 2030 target

On 16 January 2020, Microsoft Corporation announced it would be carbon negative by 2030 (Microsoft, 2020). In its announcement, it discussed its various emissions broken down by scopes 1, 2, and 3. To reduce scope 1 and 2 emissions, Microsoft said that it would take the following steps:

- By 2025, shift to 100 percent supply of renewable energy, meaning that the company will have power purchase agreements for green energy contracted for 100 percent of carbon emitting electricity consumed by all data centres, buildings, and campuses.
- To electrify our global campus operations vehicle fleet by 2030.
- To pursue International Living Future Institute Zero Carbon certification and LEED Platinum certification for the Silicon Valley Campus and Puget Sound Campus Modernization projects.

Omitted from Microsoft announcement – and presumably from its scope 3 emissions calculations, is its partnership with BP in order to use of Microsoft's artificial intelligence "Microsoft Azure Machine Learning" explore new energy deposits - also known as oil extraction (Microsoft, 2019). By adding BP to its value chain, Microsoft vastly increased its scope 3 emissions though it is unclear if these emissions are covered by its net negative by 2030 commitment.

3.2 Approaches to reach climate neutrality: Reducing, removing, and "netting"

Different countries and companies take different approaches to reach climate neutrality. These include various combinations of reducing their "own" emissions, purchasing renewable energy, and investing in emission reductions or removals.

Countries

Reducing their own direct emissions is the main way that countries are generally expected to reach their climate target on the way to climate neutrality. As an example in practical terms, this could mean replacing electricity generated in the country with fossil fuel such as coal and gas with renewables such as wind or solar, and in turn encouraging the use of public transport run on electricity, instead of having people drive private vehicles that run using internal combustion engines.

Because of the national border approach to calculating the emissions that most countries' climate targets cover, reducing **indirect emissions** is not the main focus of the climate mitigation efforts. Upstream indirect emissions "embedded" in consumption, or the downstream indirect emissions of fossil fuels sold abroad are generally not covered by – or the focus of – countries' nationally determined contribution (NDCs) or Long-Term Strategies (LTS). For countries, emissions are generally counted where they are released into the atmosphere. For example, if Zimbabwe imports electricity generated from coal in South Africa, the emissions associated with that electricity will not be counted when measuring achievement of the Zimbabwe NDC, but rather in the South African GHG inventory. Similarly, if oil from the United Arab Emirates (UAE) is sold at a German gas station to fuel a car driven on the German Autobahn, Germany will account for those emissions in its national inventory and count it against its target rather than the UAE[4]. Some countries, however, address certain indirect emissions. France, for instance, committed to end deforestation caused by importing unsustainable products by 2030 (although not as part of its climate neutrality target)(France, 2018). Similarly, although similarly not covered by its climate neutrality target, the UK provides estimates of its carbon footprint associated with UK consumption (United Kingdom Department for Environment Food & Rural Affairs, 2018).

In addition to reducing their own emissions, **various countries intend to net out or neutralise residual emissions through counting foreign emission reductions or either foreign or domestic removals towards their carbon neutrality goal.** Article 6 of the Paris Agreement allows Parties to use international offset units - so-called Internationally Transferable Mitigation Outcomes (ITMOs) – towards their domestic emission reduction targets. While Parties have not yet agreed on exact rules for Article 6, various countries are exploring opportunities for Article 6 projects. Sweden for example, set the goal of net-zero GHG emissions by 2045 and negative emissions thereafter (Swedish Ministry of the Environment and Energy, 2018). Swedish in-country emissions must be reduced by at least 85% compared to 1990, but negative emissions and acquiring emission reduction credits from other countries may be used to compensate for remaining emissions (Swedish Ministry of the Environment and Energy, 2018a) (we further discuss netting using emission reduction credits below). Finland and the United Kingdom join Sweden in indicating that they will rely to some extent on negative emissions to reach their net-zero targets – importantly by enhancing forestry sinks and – in Sweden and the UK - carbon capture and storage (CCS) (Swedish Ministry of the Environment and Energy, 2018; Government of Finland, 2019; United Kingdom, 2019). Suriname and Bhutan already claim to be 'carbon negative' and 'carbon neutral', respectively, because according to their inventory methodologies, the growth of their forests sequester more carbon than the countries' industries emit (Royal Government of Bhutan, 2015; The Republic of Suriname, 2020).

[4] In this example, Germany will account for the emissions, even if the vehicle is then used to drive on roads in neighbouring countries outside of Germany.

Both Suriname and Bhutan have increasing gross emissions so the net balance may not continue on the longer term (The Republic of Suriname, 2016; Climate Action Tracker, 2019)[5]. Suriname, recently discovered new oil fields and is expecting more fields to be found (Staatsolie, 2020). If developed, such extraction would outweigh any sink potential from the country's forests over any time span.

Reliance on carbon dioxide removal from forests also poses other challenges. One prominent issue is that of permanence. While existing trees and forest area expansion continue to sequester carbon as long as they are alive, when they die and decay, a significant portion of this carbon is returned to the atmosphere limiting the potential to absorb carbon from the atmosphere in the long term. Another challenge is the limited potential to grow forests: according to Fuss *et al.* (2018), afforestation and reforestation have the potential to remove approximately 0.5-3.6 $GtCO_{2e}$ annually. This is only a small share of global GHG emissions: 55.3 $GtCO_{2e}$ in 2018 (UNEP, 2019b). Further, an emerging body of research shows that anthropogenic climate change may have started as soon as humans started forest clearing for agriculture as long as 7,000 years ago (Ruddiman, 2007), and that pre-industrial deforestation still has a warming effect today (Pongratz and Caldeira, 2012). This suggests that reforestation will only at best, sequester emissions from previous deforestation, but has limited potential to remove the accumulation of GHG from fossil fuels in the atmosphere.

There are other ways to draw carbon dioxide out of the atmosphere, but the IPCC finds that large scale carbon dioxide removal "is subject to multiple feasibility and sustainability constraints" (IPCC, 2018). This similarly implies that carbon dioxide removal, while essential, can also not be planned on in lieu of rapid emission reductions. Specifically with regard to negative emissions, McLaren et al (2019) suggest setting separate targets for reductions and removals rather than setting a net-zero target to provide clear pressure to reach both for emission reductions *and* removals targets. It would also address the risk that sequestered CO_2 is released at a later stage, because the reduction of GHG emissions is addressed through the target on reductions (Jeffery *et al.*, 2020).

Companies / Products

For a company, **reducing its own, direct, scope 1 emissions may or may not be the main approach to achieve a carbon neutrality target depending on the kind of business the company is engaged in**. For example, for RWE, a German electric utility, that operates a variety of electricity generation plants, reducing direct scope 1 emissions to achieve a climate neutrality target would likely involve shutting down its plants that run on lignite / coal, gas, and biomass and replacing them with solar and wind electricity generation, in addition to converting any company cars and maintenance vehicles to run on renewable electricity.

In other cases, indirect scope 2 and 3 emissions represent a much larger climate impact. In the case of the German software company SAP, the proportion of direct emissions from company owned facilities and vehicles is relatively small compared to the GHG associated with the electricity used to run the company's computer servers, which is also comparatively small compared to the electricity used by other companies to run SAP's software. According to SAP's Integrated Report 2019, its scope 3 emissions are much larger than anything else: "When our customers run SAP software on their hardware and on their premises, the resulting carbon emissions are about 40 times the size of our own net carbon emissions" (SAP, 2019). Accordingly, it is likely that the majority of SAP's emission mitigation effort is carried out by buying renewable energy – see Box 2.

[5] Comprehensive historical GHG inventory data is not available for Suriname. According to the Second National Communication to the UNFCCC from March 2016, emissions and removals amounted to 6.4 Mt CO_{2e} and 8.2 Mt CO_{2e}, respectively. See: https://unfccc.int/sites/default/files/resource/Surnc2rev.pdf.

Box 2: SAP's approach to carbon neutrality by 2025

In its 2019 SAP Integrated Report, the German software firm SAP says that it is committed to making its operations carbon neutral by 2025 and that it has a commitment to 100% renewable electricity (SAP, 2019). Although in different places in the report, SAP lays out that its total energy consumption was 955 GWh in 2019, and of that the total data centre electricity represented 338 GWh. Although energy efficiency is mentioned in reference to its servers and its "Green Cloud", the main emissions reduction approach is through the "purchase of renewable electricity". The report provides neither a clear transparent breakdown of emissions by source and scope nor what its presumed grid emission factor is. The report lists that some SAP buildings have solar panels on them that produce "a small amount of renewable electricity", but the company "primarily" relies on the purchase of RECs certified by "EKOenergy" (SAP 2019). A quantification of the number of purchased RECs and comparison of the grid emission factors in regions where those RECs are produced is not provided. The website EKOenergy indicates that the renewable energy installations corresponding to RECs are located around the world. Although SAP also has offices around the world, it is unclear if these installations feed into the same grids where SAP has their offices. It is unclear how exactly SAP reaches it's 100% renewable electricity goal, which is especially important information given that electricity likely makes up a large portion of SAP's carbon footprint.

Reducing electricity consumption is the most effective way to reduce indirect scope 2 emissions, as less electricity must then be produced. Installing onsite renewable electricity generation (e.g. PV) reduces the electricity that the building draws from the grid, or if it feeds into the grid, it reduces the emissions intensity of the grid. Paired with battery storage, onsite renewable electricity generation can also contribute to local grid stability. For large companies, such as the SAP, building its own renewable electricity installations, or signing a purchase power agreement (PPA) are alternative options. A PPA guarantees that the company will buy a certain amount of electricity from a renewable energy project developer and may be an important factor in making renewable energy projects financially feasible. **RECs by comparison have been found to not be "additional" in that they often have no demonstrable impact on the construction of new renewable energy installations** – for this reason various GHG accounting practitioners and academics have called for a revision of the GHG Protocol's accounting approach to scope 2 emissions in an open letter.[6,7]

[6] See 'Open Letter Rejecting the Use of Contractual Emission Factors in Reporting GHG Protocol Scope 2 Emissions' https://scope2openletter.wordpress.com/

[7] Among RECs, there are also important differences.

Box 3: Apple's approach to 100% renewable energy

In addition to energy efficiency measures, 100% percent renewable energy is an important part of **Apple**'s strategy to reach carbon neutrality by 2030 (Apple, 2020). In its carbon accounting, Apple already considers its scope 2 emissions to be zero thanks to 100% renewable energy. Apple's approach to renewable energy however differs from many other corporates and the company highlights that 83% of its renewable energy sourcing comes from "Apple-created projects". Of these projects 12% are directly built and owned by Apple itself, 4% are projects where Apple is an equity investor in a new project, and 84% are projects where Apple has signed a PPA for new projects. Apple estimates that 10% of its renewable electricity consumption is done through utility green energy programs and a further 2% of its load is supplied by colocation facility vendors (where a data centre is shared with others). Apple explicitly says that this approach is specifically to minimise the use of RECs, which only "tak[e] away existing renewable energy available to others". Apple only resorts to RECs when other options are not available, and it is stipulated that these projects must have recently been constructed and "come from the same power grid as the Apple facility they support". In addition, Apple has the goal for its entire manufacturing supply chain to be run on 100% renewable energy by 2030. This is similarly done in part by projects that Apple itself invests in. A list of these suppliers and those that have committed to 100% renewable electricity is provided in its Environmental Progress Report.

In some cases, companies do not set targets for the company as a whole, but rather calculate the carbon footprint of a particular product and take measures to reduce the emissions impact of that product. While also a common way to "net out" corporate targets overall, offsetting using emission reductions and removals appears to be a particularly common practice for products: sending packages "climate neutrally" via DHL's "Go Green" programme; and "carbon neutral" EasyJet flights.

Box 4: Deutsche Post DHL "GOGREEN" climate neutral package delivery

Deutsche Post DHL advertises that when you send a letter or package with their "**GOGREEN**" programme, the transport and delivery are "climate neutral" (Deutsche Post DHL 2020a). The programme's brochure highlights that it supports emission reduction projects around the world, including Deutsche Post's own project in Lesotho. This may give one the impression that most of the Deutsche Post DHL climate impact reduction effort is through their financial support of these projects, but the company also has parallel goals to increase the CO_2 efficiency of their delivery by 50% by 2025 compared to a 2007 baseline (implied without offsetting), as well as to expand the use of delivery by bicycle or electric mobility to 70% also by 2025 (Deutsche Post DHL 2020b).

Box 5: EasyJet "net-zero carbon flights"

EasyJet advertises that it offers its passengers "**net-zero carbon flights**" for every single flight they operate (EasyJet, 2020). These flights are net zero through the purchase of offsets that invest in both emission reduction and removal projects certified by the Gold Standard or the Verified Carbon Standard. Separately, EasyJet also says that it has a focus on being as efficient as possible with a modern efficient fleet and that "carbon emissions per passenger kilometre were 77.07 grams" (EasyJet, 2020a). A comparison by the London School of Economics suggests that EasyJet is indeed relatively efficient compared to most airline competitors, although WizzAir is significantly more efficient than EasyJet (Transition Pathway Initiative, 2020). EasyJet does not mention the global warming impact of non-CO_2 emissions such as NO_X and contrail cirrus, which according to the IPCC may be two to four times greater than those of CO_2 – even without considering the potential impact of the contrails / cirrus cloud enhancement (IPCC, 2007).

Netting out using emission reductions

Similar to carbon dioxide removal (discussed above), the use of either ITMOs or carbon reduction credits in order to achieve carbon neutrality for a company or a product faces a number of challenges.[8] The 1.5˚C temperature goal requires that global emissions are reduced through "rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems" (IPCC, 2018) and that **all countries and sectors must rapidly decarbonise to the utmost extent possible**. This implies both that paying others to claim credit for their reductions or removals instead of reducing one's own emissions will not be sufficient to reach the overall temperature target and that as the world decarbonises, there will be fewer reductions available to buy from abroad.

Further**, offsetting one's own emissions may distract countries and companies from the fact that they should constantly take more action to reduce their own** emissions and, according to UNEP (2019a) also poses the danger that it **may even serve as a justification to continue emitting or even for emissions to increase**. Especially for companies and products, offsetting can give customers the impression that their purchasing decision does not lead to emissions actually released into the atmosphere. In the case of climate positive and carbon negative claims, the consumer may even think that their consumption has a positive impact on the climate. For instance, in the EasyJet example customers may be led to believe their decision to fly has no climate impact and therefore decide to travel by airplane. Such claims however result in higher levels of carbon emissions compared to a scenario where the passenger would not have travelled or had used alternative modes of transportation. Understanding the ongoing impact of activities that emit GHGs is important for customers to make an informed purchase decision.

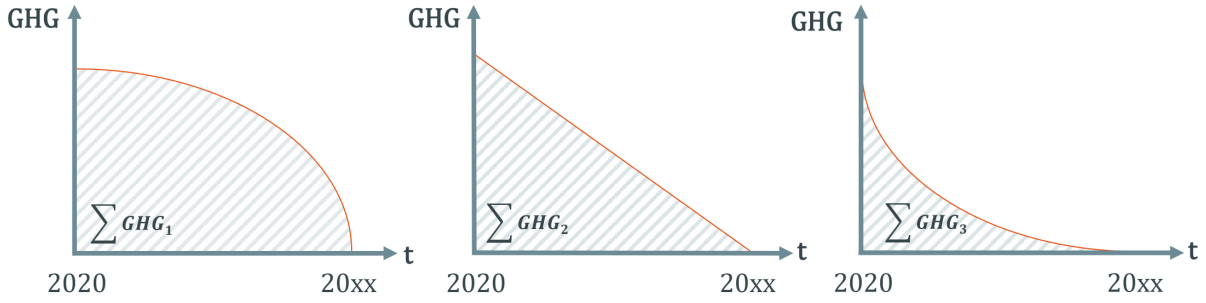
Although it does not chart an easy path to "neutrality", a growing number of actors have suggested an alternative approach to enhance transparency by reducing one's own emissions and replacing a "netting" approach with a financial support or contribution approach to help others to reduce their emissions. The Science Based Targets Initiative (SBTi), for example says that "The use of offsets is not counted as reductions toward the progress of companies' science-based targets. The SBTi requires that companies set targets based on emission reductions through direct action within their own boundaries or their value chains. Offsets are only considered to be an option for companies wanting to contribute to finance additional emission reductions beyond their science-based target/net-zero". The Gold Standard, a voluntary standard for emission reductions suggested a "Reduce within, Finance Beyond" alternative approach to netting in 2017 (Gold Standard, 2017). The French consultancy Carbone4

[8] See above for a discussion of carbon removal.

suggests a similar alternative approach to netting in their “Net-Zero Initiative” (Carbone4, 2020). Further, NewClimate’s Climate Responsibility approach also calls for financially supporting others’ climate action but not “netting” out residual emissions (NewClimate Institute, 2020b).

3.3 Decarbonisation trajectory

The challenge of actual decarbonisation is very different depending on the country and company. Some countries have abundant renewable energy resources, lots of know-how, financial resources and economies that are not reliant on heavy emitting industries – others may be more reliant on fossil fuels, have fewer financial resources, and need support in decarbonising. Similarly, some companies are able to decarbonise more easily than others. Given the scale of the challenge, it is urgent that those countries and companies that can reduce their emissions faster, immediately take action to do so - rather than waiting towards the end of the target time period.



$$\sum GHG_1 > \sum GHG_2 > \sum GHG_3$$

Figure 1: Climate implications of different decarbonisation pathways

The trajectory or path towards carbon neutrality has a large climate impact. As illustrated in Figure 1, continued emissions and then a steep descent towards the target year of decarbonisation will have a larger climate impact than a constant reduction pathway, which in turn has a higher climate impact than a rapid immediate reduction that slows towards zero at the end. Setting interim targets that define and set the actual decarbonisation pathway is therefore sometimes as important as the target year itself. While many countries provide information on interim targets – for example through NDCs, NDC updates, or national carbon budgets – most company targets do not provide or are less clear about such interim goals.

3.4 Transparency

To assess a climate neutrality target, an outside observer needs to have **sufficient information on the emissions that the target covers, how the country or company intends to reduce them, the trajectory of the emissions reduction pathway, as well as what else the country or company may be doing in terms of its climate efforts** for example by helping others to reduce their emissions.

For countries, as mentioned, the IPCC provides a standardised way to calculate emissions for the purposes of GHG inventories reported to the UNFCCC, but as mentioned above, not all targets cover all emissions. Further, the trajectory, reduction strategy, and any “netting” calculations with reductions and removals are important factors to consider.

For companies, in addition to the type of target, target year and trajectory, the information that should be provided to facilitate transparency should be broken down between gross direct scope 1, and indirect scope 2 emissions, as well as indirect scope 3 emissions. Further, an observer needs to have information on the measures taken to reduce emissions, including the basis for the calculations for emissions associated with each scope (see Table 2). In the event that carbon offset credits are purchased, they should be reported separately rather than netted.

Table 2: Important information to assess a corporate climate target

Important aspects	Further information
Target and target year	Decarbonisation by year X, information on "climate neutrality" (covering all GHG emissions) or "carbon neutrality" (including CO_2 emissions only)
Emissions sources and metrics	Scope 1: direct emissions and sources
	Scope 2: indirect emissions related to energy consumption, including kWh and grid emission factor
	Scope 3: indirect emissions in the value chain, separated by source both upstream (suppliers) and downstream (clients)
Measures to reduce emissions (potential)	Scope 1: energy efficiency, electrification
	Scope 2: energy efficiency, electrification of heat needs, installation of onsite renewable energy, longer term power purchase agreements
	Scope 3: increased resource efficiency, finding alternative suppliers, engage with suppliers and clients
Decarbonisation pathway	Shape of the curve, interim targets
Supporting others to take climate action	Who, what, where, how much?

Many companies make use of a combination of approaches, for example reducing their own direct emissions, reducing indirect emissions in their supply chain, and offsetting through the purchase of carbon offset credits. They should provide information on the relative importance of the different approaches.

However, **companies often do not provide sufficient or easily accessible information on the scope of their targets and the approaches they take.** Also, for many actors it is unclear whether they have near- and long-term strategies to achieve their target in place, and what these strategies entail. This makes it difficult to understand the meaning of a target and judge its climate impact. At the beginning of chapter 3 we introduced the carbon neutrality targets of three companies - Siemens, RWE and Volkswagen – and asked the question which of the three has the most ambitious target. However, because these three provide limited supplemental information on critical aspects, it is not possible to answer this question, because the companies provide insufficient information on the scope of emissions covered by the target and on how they expect to achieve it (i.e. reducing, removing and netting). Siemens states that switching to green energy plays an important role in reducing emissions but does not elaborate on whether it purchases RECs or signed a PPA and where the electricity is generated (Siemens, 2019). RWE's reporting focusses on Scope 1 as this is by far its largest emissions category and how it intends to expand its renewable portfolio. An internal policy to shut down fossil fuel power plants is not discussed, but rather only that Germany and the Netherlands have plans to exit coal. RWE notes that beyond 2040, in addition to its renewable portfolio, RWE expects to rely on storage, biomass,

and “mostly” green gas (RWE, 2019, 2020) – remaining fossil gas usage is not quantified, nor is there a discussion of how RWE would then reach climate neutrality. There is no discussion of the sustainability of the biomass they intend to use, nor any efforts to reduce emissions outside the power plant fleet (employee travel, etc.) Volkswagen will purchase carbon offset credits, in addition to reducing emissions and improving energy efficiency, but provides no information on the offset programmes they support (Volkswagen, 2019) (see Box 6 for a more detailed analysis of Volkswagen’s target).

Transparency on scope and approaches is also important, because it allows for a dialogue between different companies and between a company and its customers, investors, and other stakeholders. Decarbonisation is a challenging task for many actors and engaging in constructive discussions can help identify solutions.

Box 6: Assessing Volkswagen's carbon neutrality target

Volkswagen outlines in its Annual Sustainability Report 2019 that measures to reduce emissions are its main priority followed by measures to improve energy efficiency and purchasing carbon offset credits. Volkswagen also set an interim target for 2025 (Volkswagen, 2019). However, while the company gives examples of various reduction and energy efficiency measures, it does not explain what share of reference year emissions are to be reduced and what share will be offset. Also, Volkswagen states it purchases carbon offset credits generated by a certain forestry programme in Indonesia, which is important information for customers assessing the company’s carbon neutrality claim (see footnote 2 on page 1 for a brief discussion on permanence). However, the company provides no information on other offset programmes they support, nor proof of cancellation. Thus, while Volkswagen has a strategy to reach its target, the details it provides to its customers is insufficient to judge what the exact climate impact of this ‘carbon neutrality’ claim is.

4 Recommendations for ambitious climate action

Many countries' and companies' efforts towards climate neutrality play a positive role contributing to the fight against climate change and reducing global emissions. However, for some, such claims only obscure the actual impact and ambition of what is being done. In order to be able to tell the difference, it is crucial that countries and companies are transparent about what their target covers and how they intend to reach it so that customers, investors, and other stakeholders can make an informed judgement.

We therefore propose the following recommendations for countries and companies to best demonstrate their climate efforts:

1. Transparently measure, track and disclose emissions

Countries should measure, track and publicly publish their emissions according to the latest IPCC guidance. While not included in the IPCC guidance, countries should also estimate emissions from international aviation and shipping and address those. Countries should ensure to also track the embedded emissions in the goods and services they consume.

Companies should measure, track and publish scope 1 and scope 2 emissions - and scope 3 emissions to the furthest extent possible. Key performance indicators, such as electricity use per month, per square meter of office space, and per full time employee, help to define a concrete pathway for decarbonisation and to regularly measure and report progress towards the decarbonisation target (Fekete, Nascimento and Kachi, 2020).

2. Develop a strategy to reduce emissions in the near and longer term

Both countries and companies should develop long-term strategies that formulate a decarbonisation pathway which is aligned with scientific knowledge to achieve the temperature limit of the Paris Agreement. Strategies should **prioritise reducing own emissions and consider long-term technological needs and all feasible mid- and short-term actions** in the country or sector.

Countries should bring their NDCs into line with a decarbonisation strategy laid out in their LTS. More broadly, countries should look beyond their geographic borders to decarbonise incoming and outgoing aviation and shipping, as well as the embedded emissions in the goods and services they buy from abroad.

Companies' decarbonisation strategies should outline how scope 1, 2, and 3 emissions will be reduced, where those are readily within the company's control as well as how they will engage their suppliers, clients and customers about how to take further action.

3. Support others to reduce their emissions

While the number of corporate actors setting climate neutrality targets continues to increase, **other formulations may be more suitable for companies genuinely interested in addressing their emissions and contributing to the Paris Agreement temperature goal**. For instance, rather than claiming to have net-zero (carbon) emissions through the use of carbon offset credits, it is more transparent to track and publish continued gross emissions and make a separate, non-netted **contribution claim** to climate mitigation elsewhere. Supporting others would come on top of, rather than instead of reducing one's own emissions and should target inaccessible and transformation mitigation options – "high hanging fruit" otherwise out of reach for the country – that have the potential to trigger further decarbonisation.

The **contribution claim would also improve transparency and avoid some key challenges** associated with offsetting, including double claiming (NewClimate Institute, 2020b). The contribution claim model thus allows for more meaningful corporate social responsibility strategies and higher ambition, while increasing awareness of the climate impact of purchase decisions.

When countries and companies set comprehensive and transparent targets, voters can more easily assess the actions taken by their government, and customers can better understand the climate impact of their purchase decision. Further, a transparent target – and the explicit recognition that certain emissions are hard to reduce or not within direct control – allows for **constructive feedback between different actors, which can help identify solutions to decarbonisation challenges**.

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