



Climate neutrality targets of European companies and the role of carbon offsetting

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On behalf of:



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

of the Federal Republic of Germany

Implemented by

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

Impressum

Publisher: adelphi consult GmbH
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Date: 16.06.2020

This paper has been commissioned by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

Disclaimer

The analysis, results and recommendations in this paper, funded by the Federal Ministry of the Environment, Nature Conservation and Nuclear Safety (BMU), represent the opinion of the authors and are neither necessarily representative of the position of the funder nor of the Gesellschaft für Internationale Zusammenarbeit (GIZ GmbH).

Acknowledgements

The authors wish to thank the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) and the Gesellschaft für Internationale Zusammenarbeit (GIZ) for their contribution in defining specific trends and topics of analysis and for sharing their insights and experiences. Needless to say this does not imply that they endorse the analysis or recommendations included in the publication.

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Editorial/Introduction

On 4 November 2016, the Paris Agreement (PA) entered into force less than eleven months after its adoption in December 2015. The record speed with which countries ratified the agreement and met the double threshold of 55 Parties and 55% of global emissions is largely unprecedented in international policy in recent years. The approach of the PA, including its treatment of Nationally Determined Contributions (NDCs) and cooperative approaches among Parties under Article 6, is one that is fundamentally decentralised in nature. Its provisions set out parameters within which countries are to take climate action and ratchet up ambition over time, but are neither prescriptive of the actions those countries are to undertake nor the particular approaches to cooperation.

In relation to carbon markets, future guidance to be adopted by the Parties to the Agreement will have to consider the nexus of NDCs, accounting and the various mechanisms for implementing the voluntary cooperation that countries will engage in. It will need to cover in particular the avoidance of double counting, additionality issues of Art. 6 mechanisms and other issues that could jeopardise environmental integrity in the generation and transfer of mitigation outcomes, as well as ensuring transparency, good governance and the necessary institutional infrastructure. It will also need to consider the key role that carbon markets can have in enabling and encouraging greater mitigation ambition and in bringing about sectoral transformation. In particular the question of how overall ambition of the PA can be increased over time will become an increasingly important and contradictory topic.

This study aims at making a step toward a better understanding of the above mentioned issues covered by Art. 6. as well as an enhanced usage of its scope. It is supported by a grant from the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). The analysis, results and recommendations in this paper represent the opinion of the authors and are not necessarily representative of the position of the BMU

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List of Abbreviations

ACR	American Carbon Registry
BMU	Federal Minister for Environment, Nature Conservation and Nuclear Safety
CCBS	Climate, Community & Biodiversity Standards
CCS	Carbon Capture and Storage
CDM	Clean Development Mechanism
GHG	Greenhouse gases
GRI	Global Reporting Initiative
GS	Gold Standard
PKM	Passenger Kilometer
RE	Renewable Energy
SBT	Science based targets
UPS	Uninterruptible power supply
USD	United States Dollar
VCS	Voluntary Carbon Standard
WRI	World Resources Institute

Introduction

The Paris Agreement calls for a balance of anthropogenic greenhouse gas emissions by sources and sinks in the second half of this century (Article 4). As a result, all signatory states are required to undertake a transformation of their greenhouse gas-intensive sectors. In order to master this task, the private sector in particular plays a crucial role. The instrument of trading greenhouse gas (GHG) emission reductions has had a turbulent decade with fluctuating prices and trading volumes as well as criticism regarding its contribution to GHG mitigation. However, demand from businesses and individuals has been rising strongly since 2018 (Donofrio et al., 2019).

This study examines the climate mitigation targets of 44 companies in Europe and the role carbon offsetting plays for achieving the targets. The companies surveyed include the 30 companies in Europe with the highest turnover in the Forbes Global 500 List of 2019¹. A further 14 companies were selected because of their strategic significance in consultation with the Federal Ministry for Environment, Nature Conservation and Nuclear Safety (BMU). A detailed list of the companies is given in the Annex.

The companies surveyed annually emit more than 4 billion tons of greenhouse gases. Whereas a large part of the companies offer some kind of information regarding their climate impact, seven of 44 companies report only incomplete data of GHG emissions or no data at all². Companies furthermore do not report emission data for specific locations, subsidiaries, countries or continents, therefore these emissions do not occur in Europe alone.

We have obtained the data for this study from annually published sustainability reports and companies' annual or financial reports, as well as from the respective websites. We have also sent questionnaires to all companies about their climate mitigation goals and the role of carbon offsetting. One quarter of the companies have answered with further details about their plans.

For this study, we have examined the following questions (Chapter 1 and 2):

- Do the companies define the target of becoming climate neutral, net-zero or carbon neutral?
- How do companies interpret climate neutrality?
- Have the companies set or do they intend to set "Science-Based Targets"³? And if so, are they oriented towards limiting global warming to below 1.5°C or to "well below" 2°C?
- What role does carbon offsetting play in the companies' climate mitigation and neutrality strategy?
- Which carbon offsetting project types are the companies supporting or planning to support?
- What are the favored host countries?
- What are the favored offsetting standards?

We also take a closer look at the oil & gas and automotive sectors, since both include companies with the highest GHG emissions of the companies surveyed (Chapter 3).

¹ <https://fortune.com/global500/2019/search/>

² Unless otherwise stated, all information on the companies is obtained from the sustainability reports or annual reports. The titles of the reports can be found in the Annex.

³ <https://sciencebasedtargets.org/>

1 Climate mitigation targets and the interpretation of climate neutrality

1.1 Climate neutrality and carbon offsetting

The terms “climate neutral”, “net zero” and “carbon neutral” are largely used synonymously (Broekhoff et al, 2019). While the term “climate neutrality” does not directly appear in the Paris Agreement, the European Parliament interprets Article 4 of the Paris Agreement (the balance between sinks and sources) as a commitment to climate neutrality⁴. A sink is a system that absorbs more carbon than it emits. Natural carbon sinks are the ocean uptake and the uptake by the terrestrial biosphere. They sequester about 9.2 and 11.7 Gt of CO₂e per year, respectively. This contrasts with emissions (sources) of 40.3 Gt of CO₂e per year by fossil fuels and land use change (Friedlingstein et al, 2019). The numerical difference between sources and sinks is the annual growth of the atmospheric concentration of greenhouse gases.

Politically, climate neutrality is guiding agendas of transition. The European Green Deal provides a roadmap with actions to lead the European economy to climate-neutrality by 2050⁵. It also calls for all sectors of the European economy and society to play their part. However, reducing all GHG emissions resulting from their activities and products to zero while staying competitive in a globalized market is mammoth task for companies. Therefore, carbon neutrality is often accompanied by the idea of using carbon offsets – voluntary and certified emission reductions achieved outside the company’s scope of action – to balance unavoidable emissions (Broekhoff et al, 2019).

The central underlying idea of the offsetting debate is that it is irrelevant where the GHG abatement takes place as long as the global or company specific target is met. The savings are therefore not made within the company or even in the country the company is operating in, but elsewhere, by another company or in another country. However, achieving climate neutrality by using carbon offsets alone is not sufficient to limit global warming to well below 2°C or even close to 1.5°C. Even if all countries in the global north were to offset all their GHG emissions in countries of the global south, people in the global north still would not live in a “climate-neutral” way. The GHG emissions the global north would offset were too high for achieving the 2°C target of the Paris Agreement (atmosfair gGmbH, 2019). Carbon offsets can therefore only be useful as a supporting measure. Innovation and dissemination of necessary technologies as well as behavioral changes are further pillars to ensure avoided and reduced emissions of greenhouse gases.

1.2 Climate mitigation and climate neutrality targets

In this chapter, we present the climate mitigation targets of the 44 companies surveyed. Almost half of the companies (21 of 44) aim at becoming a climate-neutral company or group (Table 1), whereby the understanding of the term is very different. An overview of all GHG mitigation targets, interim targets, the anticipated target year and mitigation measures planned for all 44 companies surveyed is provided in Annex. Our survey reveals a diverse set of characteristics

⁴ <https://www.europarl.europa.eu/news/en/headlines/society/20190926STO62270/what-is-carbon-neutrality-and-how-can-it-be-achieved-by-2050>

⁵ <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12108-Climate-Law>

of climate neutrality targets that are important to recognize when considering their relevance for implementing ambitious climate targets.

Climate neutrality or net-zero claims

Almost half of the companies investigated (21 of 44) aim to become a climate neutral or a net-zero company or group. The companies surveyed understand these terms very differently and rarely include all scopes of GHG emissions in their climate neutrality target. We find only three cases in which a company aims to reduce all three scopes of GHG emissions to net-zero: Allianz, Total and Volkswagen.

- Allianz simply uses carbon offsets for all of its GHG emissions to claim climate-neutrality since 2012, while the company saw an overall increase in GHG emissions by 7.6% since 2012.
- Total limits the validity of its Scope 3 target to the European market only, while Total aims reducing its Scope 3 GHG emissions by 60% worldwide. For the Oil & Gas companies, Scope 3 GHG emissions mainly consist of emissions from the use of petroleum products by their customers.
- Volkswagen aims at becoming climate-neutral in 2050 and will use carbon offsets “in the millions to begin with”⁶ to achieve climate-neutrality, but the company also intends to gradually reduce the use of carbon offsets. Volkswagen represents the 4th highest overall GHG emissions of the companies surveyed and incorporates its climate-neutrality target in a Decarbonization strategy including absolute and specific targets.

With one exception, no company provides a definition of the concept of climate neutrality in its publications or on its website. The companies understand climate neutrality or net-zero emissions as being able to report zero emissions in at least one Scope of GHG emissions by avoiding, reducing or offsetting residual emissions. Only Nestlé presents a definition of the concept and even excludes carbon offsets:

“Achieving a balance between emissions and removals for all greenhouse gases within a company’s value chain over a specific time period. Avoided emissions and offsets are not counted as part of the commitment.”⁷

The following table gives an overview of the 21 companies, which claim to strive for climate neutrality. We present the neutrality claim and the targets in the individual emission scopes. We have excluded companies, if the climate neutrality target addresses only individual activities and therefore less than one scope of GHG emissions (e.g. business air travel).

⁶ Personal communication with the Volkswagen General Secretariat and Group Strategy Sustainability Management

⁷ <https://www.nestle.com/ask-nestle/environment/answers/nestle-climate-change>

Table 1: Climate neutrality claims and breakdown in scope targets.

Company	Climate Neutrality Claim	Reduction targets of single scopes of GHG-emissions	Comment
Airbus	Ambition to achieve climate neutrality in Scope 1 and 2 emissions.	Scope 1: 100% Scope 2: 100% Scope 3: 0%	
Allianz	Allianz Group has been carbon-neutral since 2012.	Scope 1: 100% Scope 2: 100% Scope 3: 100%	Allianz relies on offsetting all GHG-emissions since 2012. Total GHG emissions between 2012 and 2018 increased by 7.6%.
ArcelorMittal	Ambition to reduce CO ₂ emissions by 2050 and, in Europe, achieve carbon neutrality by this date.	Scope 1: 100% Scope 2: 100% Scope 3: n/a	The target only applies to European facilities, "where regulation today is most advanced".
Assicurazioni Generali	Decarbonization of the general account investment portfolio in order to reach climate neutrality by 2050	Scope 1: 100% Scope 2: 100% Scope 3: 0%	
Banco Santander	Become carbon neutral in 2020 by offsetting all emissions generated by own operations.	Scope 1: 100% Scope 2: 100% Scope 3: 0%	Banco Santander mainly relies on offsetting to achieve its climate neutrality target.
Bertelsmann	Bertelsmann intends to be climate-neutral for the GHG emissions generated at its locations, by its employees' mobility, and the manufacture of its own products by 2030.	Scope 1: 100% Scope 2: 100% Scope 3: n/a	Unclear if total scope 3 emissions are included in the target. In 2030. Bertelsmann aims to reduce GHG-emissions of 1 Mio. tCO ₂ e and offset all remaining emissions.
Bosch Group	Make emissions in direct sphere of influence (scope 1 and 2) climate neutral worldwide by 2020.	Scope 1: 100% Scope 2: 100% Scope 3: 0%	Bosch is planning to offset all residual GHG-emissions, which the company does not manage to reduce until 2020.
BP	Net-zero company by 2050 or sooner.	Scope 1: 100% Scope 2: 100% Scope 3: 50%	Scope 3 emissions account for 76% of total GHG emissions by BP.
Daimler	Aim for production facilities to be carbon-neutral by 2022 (2039).	Scope 1: 100% Scope 2: 0% Scope 3: 0%	Plans call for all German passenger car production facilities to be 100% CO ₂ -neutral by 2022. European locations follow in 2039.
Deutsche Bahn	Become a climate-neutral group until 2050	Scope 1: 100% Scope 2: 100% Scope 3: 0%	No explanation of the target with regard to Scope 3 emissions.

DHL	Reduce all logistics-related emissions to net zero by the year 2050.	Scope 1: 100% Scope 2: 100% Scope 3: <100%	
Electricité France	Committed to achieve carbon neutrality by 2050	Scope 1: 100% Scope 2: 0% Scope 3: 0%	Electricité France did not yet communicate its target in their sustainability report.
Enel	Progress towards a zero-emission generation portfolio and decarbonize by 2050 (decarbonize the energy-mix).	Scope 1: 100% Scope 2: 100% Scope 3: 0%	
Nestlé	Net-zero greenhouse gas emissions pledge by 2050.	Scope 1: 100% Scope 2: 100% Scope 3: n/a	No explanation of the target with regard to Scope 3 emissions. Nestlé does not include offsets in their climate neutrality target.
Peugeot	Production facilities to be climate neutral until 2050.	Scope 1: 100% Scope 2: 0% Scope 3: 0%	
Royal Dutch Shell	Become a net-zero emission energy business by 2050 or sooner.	Scope 1: 100% Scope 2: 100% Scope 3: 65%	Scope 3 emissions account for 86% of total GHG emissions by Royal Dutch Shell.
Siemens	Committed to achieving carbon neutrality by 2030.	Scope 1: 100% Scope 2: 100% Scope 3: 0%	Siemens will eventually use carbon offsets if it does not achieve its target through reduction measures.
Tesco	Reduce absolute carbon emissions from Tesco's operations by 100% by 2050.	Scope 1: 100% Scope 2: 100% Scope 3: 0%	Tesco aims at becoming carbon neutral in the UK by 2035.
Thyssen Krupp	Long-term target to be climate-neutral by 2050	Scope 1: 100% Scope 2: 100% Scope 3: 0%	No explanation of the target with regard to Scope 3 emissions.
Total	Net Zero across Total's worldwide operations by 2050 or sooner.	Scope 1: 100% Scope 2: 100% Scope 3: 100%*	Scope 3 target only applies for Europe. Scope 3 emissions worldwide shall be reduced to 40% of today's emissions by 2050.
Volkswagen	The objective is the complete decarbonization of the Group by 2050. This includes Scope 1, 2 and 3 emissions.	Scope 1: 100% Scope 2: 100% Scope 3: 100%	Volkswagen is one of the only companies surveyed that includes a 100% reduction of Scope 3 emissions in its climate change strategy.

Absolute and relative targets

When defining climate neutrality or climate mitigation targets, companies set absolute GHG emissions targets as a percentage of their total emissions (in one or more scopes or single activities within a scope) or they define relative (or specific) mitigation targets. The latter means

that companies aim at a reduction in GHG emissions in relation to e.g. their turnover, their number of employees or their production volume. A relative target can be achieved even if the total GHG emissions of a company increases. Where possible, we convert these relative mitigation targets into absolute values to provide an assessment of total GHG mitigation for the next decades (Figure 2). This is not possible if companies do not publish data underlying their specific targets with a certain degree of detail required for converting the target. Lufthansa defines the relative mitigation target to “reduce its specific CO₂-emissions (Scope 1) by 25% by 2020, with 2006 as the base year (in kg CO₂/100 pkm)”. Lufthansa does not include all Scope 1 GHG emissions in the target, but only provides an aggregated Scope 1 emissions value. This makes it impossible to convert the target into absolute GHG-emissions.

Geographical limitation

Although the companies surveyed are all based in Europe, their targets and reported GHG emissions are not limited to the European market. Only in a very few cases do companies present emission data for individual markets or limit their targets to a specific market. Tesco (2035) and Daimler (2022) aim at climate neutrality in the country where their headquarters are located first before widening their target to other markets; others limit their target to the European Market (Daimler (2039), ArcelorMittal, Peugeot, Total).

Total intends to achieve a 100% reduction of Scope 3 GHG-emissions, but plans to do so for its European business only, while on a global scale the company aims to reduce Scope 3 emissions by 60% until 2050. Total released its ambition in a press release on May 5, 2020 only and a detailed strategy is yet to follow. In the press release, Total argues that the reason for the stricter target for the European market is the fact that the EU itself has defined a climate neutrality target:

“To achieve that ambition, where Governments in a given region commit to take policies and regulations aiming at Net Zero, Total will commit to achieve Net Zero emissions by 2050 across all its production and energy products used by its customers in such a region. As the EU has set the target to achieve Net Zero emissions by 2050 and thereby lead the way for other regions to become carbon neutral over time, Total takes that commitment for all its businesses in Europe”⁸

ArcelorMittal argues in line with Total, that the stricter target for the European market is due to European legislation:

“We are working on the technologies for several potential pathways including circular carbon and clean power, and these underpin our ambition to significantly reduce our carbon footprint by 2050. We are in the process of running pilots of these different technologies at various plants in Europe, where regulation today is most advanced, and where we have an ambition to reach carbon neutrality by 2050. This work will enable us next year to publish a more specific 2030 reduction target.”⁹

Increasing energy efficiency and use of renewable electricity are central to achieving climate mitigation goals

Companies focus on increasing the use of renewable energies and on increasing the energy efficiency in their operations. 93% and 95.5% of all companies surveyed emphasize these two options as their efforts so far in their climate change strategies. In the Annex we have compiled all the mitigation measures the companies intend to implement in order to achieve their mitigation targets. We have broken down the companies by sectors, as this makes it possible to identify common themes. For example, all companies in the automotive sector plan to

⁸ <https://new-publications.total.com/05052020/pr/original-joint-statement-total-climate-action-100-plus.pdf>

⁹ Arcelor Mittal (2019): Climate Action Report 1. May 2019.

increase the supply and sales of vehicles with an electric engine and all companies in the oil and gas sector plan to achieve their climate targets in the future by increasing the use of natural gas instead of oil (low carbon fuels).

Time Horizon of mitigation targets

We observe that the majority of the 21 companies that released a climate neutrality target aim at reaching that target in 2050 (Figure 1). If we look at all companies surveyed, we even find that only 13 companies defined GHG mitigation targets for the year 2025, although in many cases companies plan to release a new climate change strategy in 2020, which might include interim mitigation targets for 2025 and 2030.

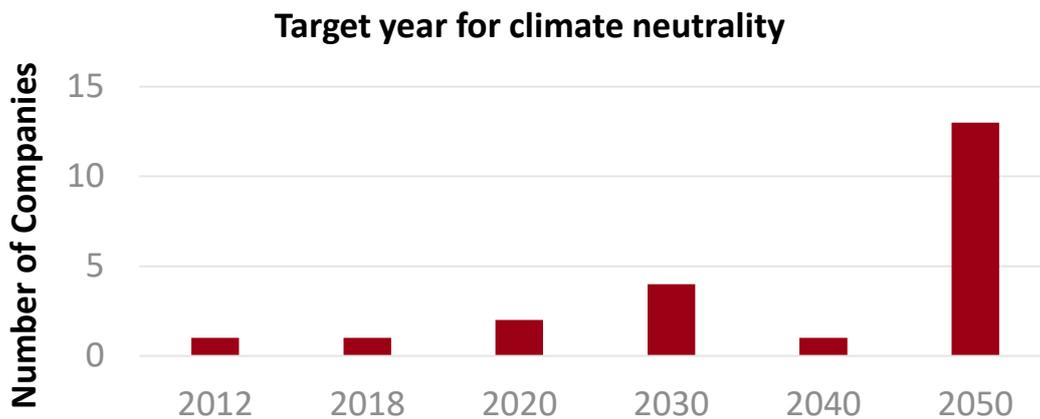


Figure 1: Target year for climate neutrality or net-zero claims defined by the companies.

In order to estimate the total amount of greenhouse gas emissions which are not yet covered by a mitigation target (by emission avoidance, reduction or offsetting measures) and therefore could be emitted in the years up to 2020, 2030 and 2050, we have, where possible, converted all relative climate mitigation targets by the 44 companies into absolute emission values. The GHG emissions not covered by a target in Figure 2 represent the minimum amount, since we were not always able to convert relative to absolute targets. We have further assumed a static development of GHG emissions in each scope of GHG emissions and by each company.

Figure 2 shows that the 44 companies plan to reduce, avoid or offset a majority of scope 1 GHG emissions (79%) and scope 2 GHG emissions (57%) and just over half (51%) of scope 3 GHG emissions by 2050. The total amount of GHG emissions not yet covered by a target in 2050 amounts to 1,636 MtCO₂e. We cannot interpret these total emissions with regard to the European Green Deal, as they are not only emitted to the EU, since a majority of companies operates globally.

The figure further shows that the amount of GHG emissions in each scope addressed by interim targets by 2030 is very low (Scope 1: 8%, Scope 2: 7% and Scope 3: 11%) as well as for the target year 2020. The following factors contribute to the low amount of emissions covered by targets for the years 2020 and 2030:

- Major emitters (BP, Shell, Total, Uniper and ArcelorMittal) did not define concrete 2020 or 2030 targets for each Scope of GHG emissions, but did so for 2050.
- Companies that define a 2020 target partially achieved their target ahead of schedule.
- Several companies have announced revised climate mitigation strategies for the current year 2020, which could include mitigation targets for 2020 and 2030.

Breakdown of annual GHG emissions (for assumed static 2018/2019 GHG emissions) into emissions covered by a reduction target and those not yet covered by a reduction target

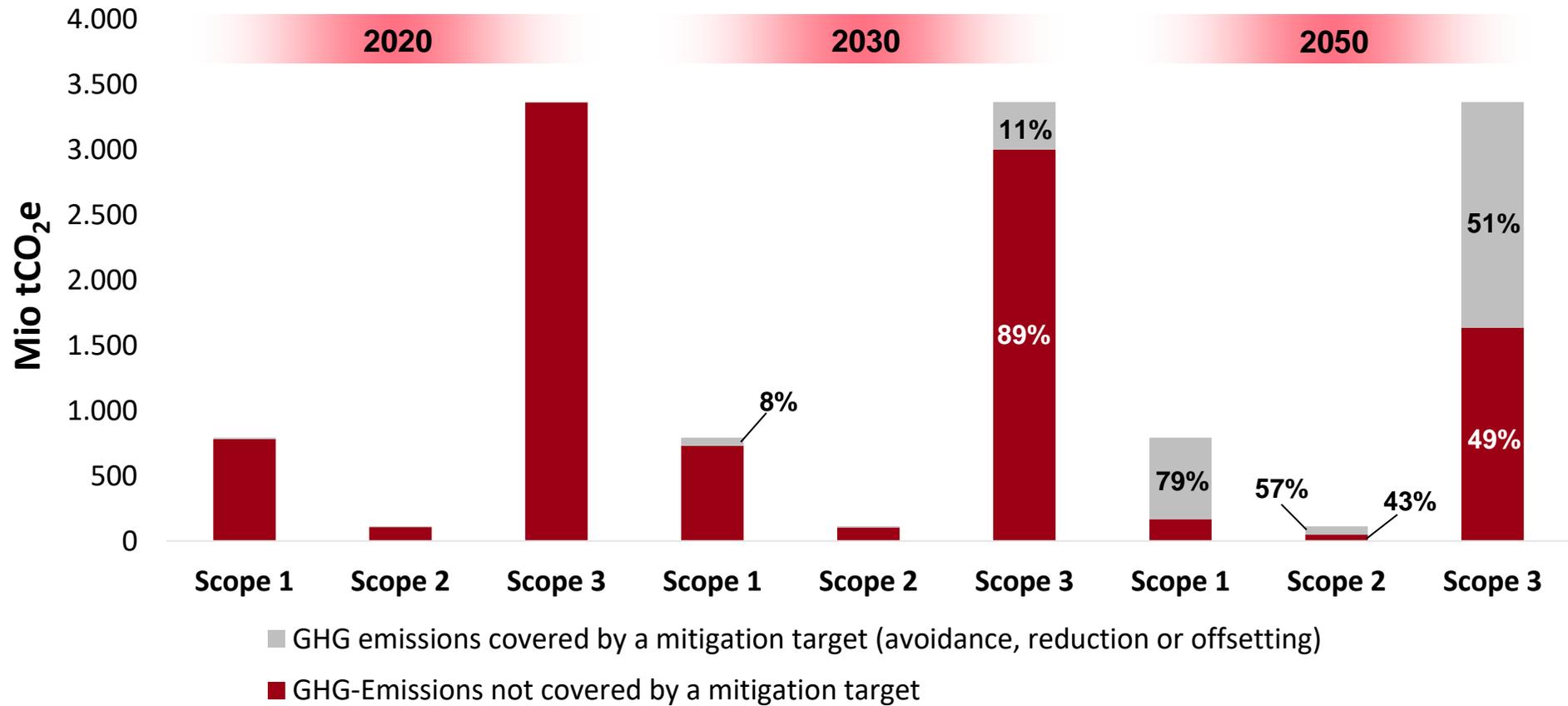


Figure 2: GHG emissions covered and not covered by GHG mitigation targets by all 44 companies surveyed.

1.3 Commitment to the “Science-based targets” Initiative

The Paris Agreement and its targets are strongly influenced by assessment of climate science. This strong reference is partly also reflected in the rationale behind the targets of the companies analyzed in this report. Eighteen of the companies surveyed have set “Science-based target”. The majority of these companies (15) are pursuing efforts to keep global warming well below 2° C, while three companies (Deutsche Telekom, Tesco and Unilever) pursue greater efforts towards a 1.5°C trajectory. Bosch states, that they are examining to commit to a “Science-based target” in the future.

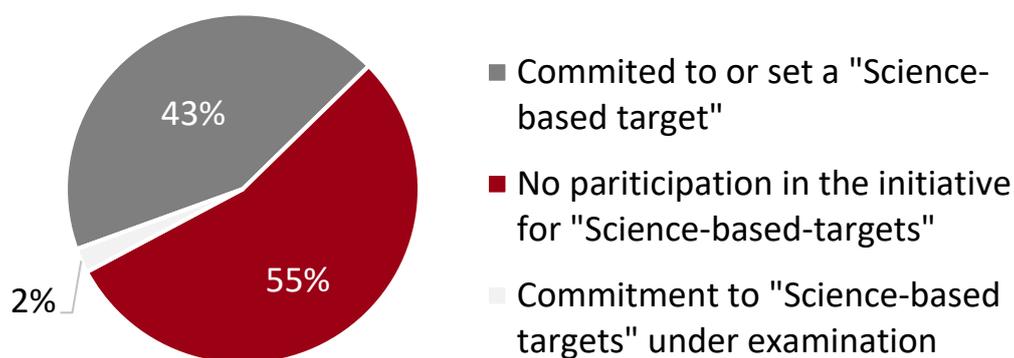


Figure 3: Share of companies that set a "Science-based target".

2 Amount and type of carbon offsets requested by the companies

Less than half of the 44 companies surveyed (42%) are using carbon offsets today and 9% will eventually use carbon offsets in the future to achieve their GHG mitigation targets (Figure 4). Another 12% are offering carbon offsets to their customers. Companies could try to use these offsets also to achieve their own mitigation targets, but would risk a double claiming of emission reductions. DHL Deutsche Post therefore excludes the use of emission reductions sold by the company to achieve its own targets.

All companies surveyed

- Company is offsetting GHG emissions
- Company is offering carbon offsets
- Company will use carbon offsets eventually
- No offsetting of GHG emissions planned
- No data available

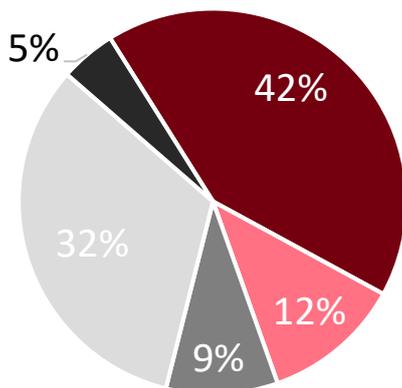


Figure 4: Use of carbon offsets among all surveyed companies.

Companies aiming at becoming climate neutral

- Carbon offsets will or will eventually be used to achieve climate neutrality
- No use of carbon offsets planned to achieve climate neutrality

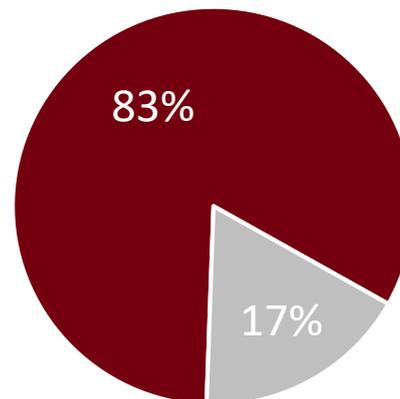


Figure 5: Use of carbon offsets among companies aiming at becoming climate neutral.

Other examples of companies that offer carbon offsets to their customers are Shell, BP and Deutsche Bahn. Shell and BP do so to customers at petrol stations in the Netherlands and the UK. The logistic companies DHL Deutsche Post and Deutsche Bahn – the latter only for international goods traffic – offer carbon offsets optionally for customers requesting a climate-neutral service. Brand names of these services include *BP Target Neutral* or the *GoGreen* (DHL Deutsche Post). DHL Deutsche Post is directly involved in at least one of the projects they offer, according to the project description on their website¹⁰. DHL finances an improved cook stove project in Lesotho, which is implemented in cooperation with the non-profit climate protection organization atmosfair and the local partner SolarLights. The project is registered under the Clean Development Mechanism (CDM) and the Gold Standard (GS). It is unclear to what extent BNP Paribas, BP, Deutsche Bahn and Shell are involved in the projects offered

¹⁰ <https://www.dpdhl.com/en/sustainability/environment-and-solutions/green-products-and-services/climate-protection-projects.html>

by them, i.e. whether it is a simple purchase of certificates or, as in the DHL case, also a direct investment in the project.

Another 9% of the companies surveyed have stated that they are considering using carbon offsets (Figure 4), mostly if they fail to achieve their reduction targets otherwise or if customers would ask for climate-neutral products. One example from companies in this category is Siemens. The company is planning to become carbon neutral by 2030 and intends to achieve this goal by focusing on reducing its energy needs, an increase of energy generation from renewable sources, a reduction of their fleet emissions and the purchase of green electricity. Siemens will use carbon offsets if residual GHG emissions remain.

Offsetting is much more popular with companies that have already announced their move towards climate neutrality. Of the 21 companies aiming at becoming climate neutral, a majority of 83% will use or are considering the use of carbon offsets to achieve their climate neutrality targets (Figure 5). This shows that carbon offsets play an important role in companies' climate change strategies and that demand may increase as more companies announce and implement climate neutrality targets.

2.1 Potential demand for carbon offsets

Only 8 of 18 companies, which are already using carbon offsets report the number of carbon offsets retired during the last year and only Bertelsmann quantifies their future demand more or less precisely ("reduce GHG emissions by 50 percent compared with 2018 GHG emissions and offset remaining GHG emissions"). The demand for carbon offsets will depend on future production volumes as well as on how successful companies implement other climate mitigation measures. We see that even if a company defines one activity, which it intends to offset in the future, often no estimation is made regarding the total quantity of offsets needed in the coming years. The use of carbon offsets is a backup tool that companies plan to use if they fail to achieve mitigating GHG emissions otherwise. In order to be able to quantify the demand for carbon offsets, we have analyzed the climate mitigation plans and statements with regard to carbon offsetting of the companies and, where possible, made our own estimate. In the following, we present two examples to show that our calculation of future demand for carbon offsets depends on the transparency of corporate reporting (Daimler) and that demand can be much higher depending on how the companies in the oil & gas sector implement their climate protection strategy (Royal Dutch Shell).

Shell alone can drive the demand for carbon offsets significantly

Royal Dutch Shell is one of five companies from the oil & gas sector in our survey and the company with the highest amount of GHG emissions of all companies surveyed. Shell emits a total of 656.000.000 tCO₂e every year, of which 88% are Scope 3 GHG emissions resulting mainly from the use of the oil and gas products Shell produces.

In a Responsible Investment Annual Briefing in April 2020¹¹, Shell announced its target to become a net-zero emissions company to contribute to the achievement of the Paris Agreement. The published presentation lacks reliable data to estimate the contribution of each individual measure to the overall reduction required. Shell announced their net-zero ambition only one week after their sustainability report 2019 was published, which was thereby outdated in many parts after one week.

¹¹ Shell's CEO announced a climate neutrality target for the company in Shell's Responsible Investment Annual Briefing 2020 on 16th of April 2020. These targets are not mentioned in Shell's Sustainability Report 2019, published on 7th of April 2020.

By 2035, Shell plans to reduce its scope 3 emissions by 20% (or around 115 Mio tCO_{2e} annually) and by 2050 scope 3 emissions are to be reduced by 50% (or 288 Mio tCO_{2e} annually). Shell plans to achieve their targets through several measures shown in Figure 6. In addition to increasing the operational efficiency in the extraction of fossil fuels, switching from oil to gas, the use of renewable energies and the use of Carbon Capture and Storage (CCS), carbon offsets (or nature-based solutions) will be used more intensively than today.

To increase the share of renewable energies in its own energy mix, Shell has expanded its investments, acquisitions and ventures in wind and solar power plants and in companies (e.g. sonnen GmbH) active in the renewable energy sector in the last years and plans to continue this work. Between 2018 and 2019, Shell's renewable energy power plants have contributed to reduce combined scope 1 and scope 2 emissions by 2.5% or 2 Mio tCO_{2e}.

Shell is already one of the world's largest producer of biofuels and is growing its fast-charging electric mobility service. The company is also investing in a hydrogen-refueling network.

Shell operates the *Quest CCS project* (Shell's interest 10%) in Canada, which can capture and store around 1 Mio tCO_{2e} annually as well as the *Gorgon LNG CCD* facility in Australia. Gorgon will, when fully operated, be the world's largest CCS facility and capture up to 4 Mio tCO_{2e} annually. The company is involved in at least six CCS facilities.

Carbon offsets will play a significant role in Shell's climate change strategy. The company plans to offer its customers a combined product of natural gas and carbon offsets equal to the greenhouse gas emissions of the natural gas. In 2019, Shell provided around 3% of the world's natural gas and the company manages the world's largest fleets of LNG carriers.

MEETING THE AMBITION: POTENTIAL SOLUTIONS TO ACHIEVE OUR AMBITION

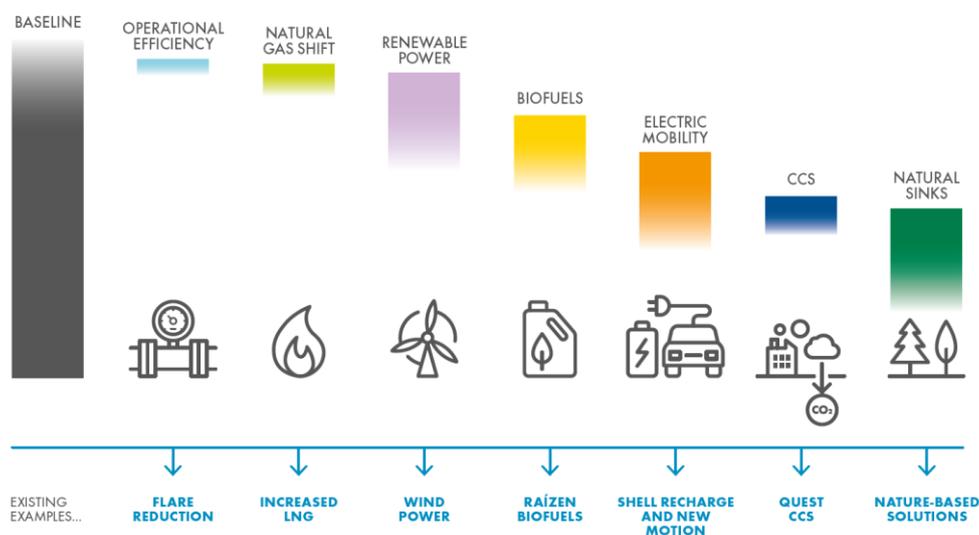


Figure 6: Shell's potential actions to become a net-zero emissions business (Figure from Shell's "Clean Energy Solutions" Brochure).

None of the measures proposed seem to be available in the necessary scale as of yet, it is possible that Shell will use carbon offsets as a backup tool to achieve their targets. Regarding the total amount of GHG emissions to be mitigated in 2050, this can drive the demand for carbon offsets to unprecedented levels. However, based on the data published by Shell, we are not able to make a reliable estimation.

The automotive industry has other potential options, but still uses carbon offsets

VW and Daimler will use carbon offsets in the coming years and Peugeot will offset GHG emissions to guarantee the carbon neutrality of the group (if other mitigation measures fail). Compared to the oil & gas majors, the automotive industry is not yet planning to use carbon offsets for Scope 3 emissions resulting during the use-phase of their vehicles sold.

Daimler plans to become CO₂-neutral by 2039 for at least Scope 1 and Scope 2 GHG emissions, but depending on the lifetime of its car and van models sold with an internal combustion engine and the sale structure of alternative models, the company can achieve a drastic reduction in Scope 3 emissions as well. In its climate change strategy, the company provides a range of targets for 2039 and several interim targets. Table 2 gives an overview of the specific targets we use to estimate Daimler's GHG reductions in Figure 2 and the demand for carbon offsets in the coming years.

Table 2: Daimler's climate mitigation targets and mitigation approaches.

Daimler	Targets	Mitigation approach
Vehicle fleet: cars, vans, trucks and buses	<p>Reduction of 44 % CO₂ emissions for cars in new-vehicle fleet in the EU (2007-2021).</p> <p>Sales structure in which plug-in hybrids and all electric drive systems account for more than 50% of the portfolio by 2030.</p> <p>CO₂-neutral fleet of new cars until 2039 including all stages of the value chain.</p> <p>Vans targeted at private customers are to be CO₂-neutral over the entire lifecycle by the year 2039.</p>	<p>Optimized use of today's fossil fuels.</p> <p>Use of natural gas-based fuels, synthetic fuels, biofuels and all electric drive systems.</p> <p>Use of hydrogen and electricity generated from renewable sources.</p> <p>In the future, renewably produced synthetic fuels can also make an additional contribution to achieving the climate targets.</p> <p>Offer a completely CO₂-neutral new vehicle fleet by 2039.</p>
Production facilities	<p>Reduction of absolute CO₂ emissions at European factories by 20% and specific CO₂ emissions by 66% by 2020 (base year 1990).</p> <p>Reduction of specific CO₂ emissions (per vehicle) at production facilities worldwide by 40% by 2020 as compared to 2007.</p> <p>Production facilities to be carbon-neutral by 2022 (Europe) and 2039 (World).</p>	<p>Obtain electrical energy exclusively from renewable sources in the future.</p> <p>Plans call for all manufacturing facilities in Germany to be supplied with CO₂-neutral energy by 2022.</p>
Offsetting approach	<p>Focus on avoidance and reduction first, but Daimler will offset all CO₂ emissions from their gas-fired cogeneration plants (combined heat and power) at the German production sites.</p> <p>We estimate that Daimler will offset up to 780,000 tCO₂e annually.</p>	

Daimler publishes environmental reports for each production facility in Germany including (in 5 out of 8 cases) the shares of each energy source in the energy mix of the facilities and the amount produced by own combined heat and power plants in a detailed manner. This information is sufficient to estimate Daimler's demand for carbon offsets in the coming year.

A great demand for offset, even without the potentially largest customers

We estimate the demand for carbon offsets in the coming years based on data published by the companies and on information provided in direct communication with the companies. In some cases, companies are already setting up their own offsetting projects, which they intend to use in the future. In this case, we have allocated all emission reductions from these projects exclusively to the company.

We estimate the amount of offsets needed annually by the 44 companies excluding BP (for own mitigation targets) and Shell to be **17.5 Mio tCO₂e in 2020** and almost double the amount of **32.2 Mio tCO₂e in 2030**. The main buyers in our estimation are Total, Volkswagen and ENI, all of which could demand millions of offsets annually in the coming years.

The estimated value of carbon offsets needed for 2020 exceeds the total emission reductions anticipated for the year 2020 we calculated in Figure 2 for the following reasons:

- In our estimation regarding the amount of carbon offsets needed in 2020, we also include the amount of carbon offsets companies offer to their customers but don't use to account for their own GHG mitigation targets (e.g. DHL Deutsche Post, BP).
- If a company does not define a GHG mitigation target for 2020, it still could have invested in offsetting projects to use later for achieving future mitigation targets (e.g. ENI is investing in several forestry projects, which will issue carbon offsets in the millions in the coming years).

In contrast, our estimation regarding the demand for carbon offsets in 2030 only accounts to 7% of total GHG emission reductions envisaged by the companies in that year (Figure 2).

2.2 Offsetting projects, host countries and standards

Companies that are using carbon offsets can choose between different project types and offsetting standards to support. For 20 companies or 48 projects, we were able to trace which project types these companies support. With regard to the offsetting standard, we were able to determine for 17 companies or 44 projects under which standard their offsetting project is registered. An overview of each company and the respective project types, offsetting standard and host countries they support or plan to support is given in Table 5 at the end of this chapter.

We categorize the types of offsetting projects into the six categories Forestry and Land-Use, Household Devices, Renewable Energy (RE), Waste Disposal and Energy Efficiency/ Fuel Switching. For every company we tried to identify each project, its type and offsetting standard. If a company only names a general project type they support but not the number of projects, we have counted that project type (or offsetting standard) once. The data for the project type and offsetting standard supported is presented in Figure 7 and Figure 8.

The most popular types of projects for the companies surveyed are "Forestry and Land Use" (38%) and "Household Devices" (38%). The first includes REDD+ projects as well and projects related to reforestation or prevention of deforestation and peat restoration and protection. Another 38% of projects fall under the category "Household Devices", which includes improved cooking solutions, household biogas units or water filters, although we have only found one

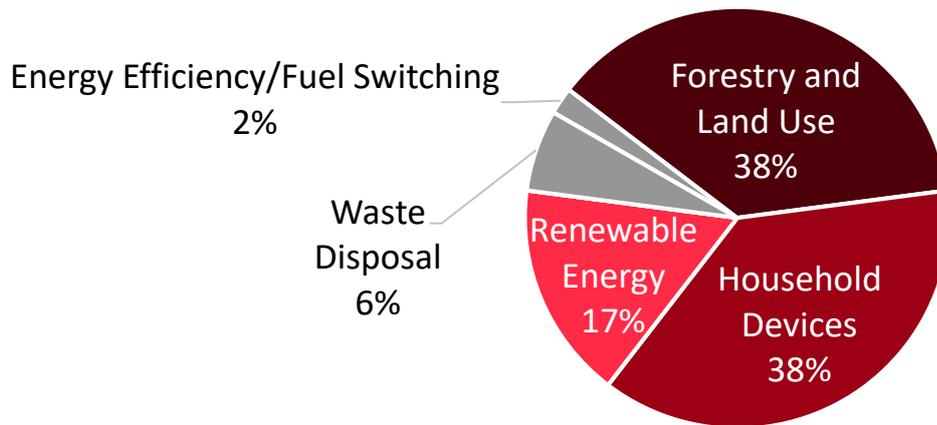


Figure 7: Types of offsetting projects supported by all companies.

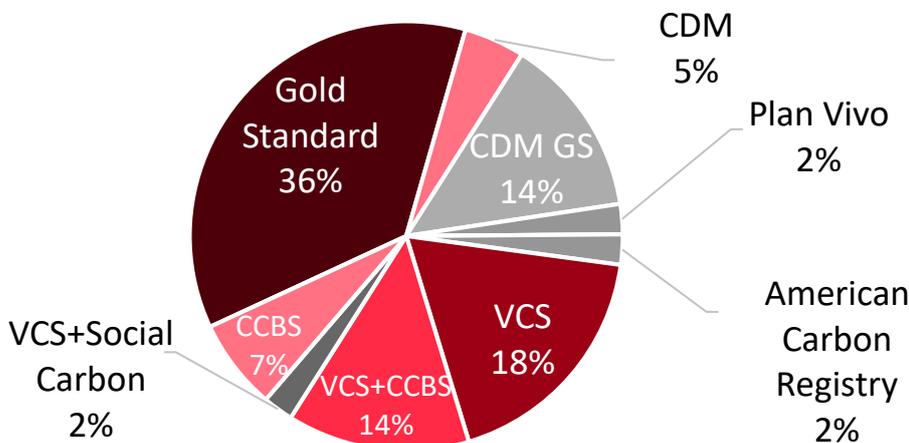


Figure 8: Type of offsetting standard supported by all companies.

company (DHL) supporting a water filter project. 17% of the projects supported by the companies' surveyed fall under the category Renewable energy.

The Gold Standard (GS) or Gold Standard for the Global Goals (GS4GG) is the offsetting standard used most by the companies surveyed (Figure 8). The standard alone is used in 36% of the projects and in combination with the Clean Development Mechanism (CDM) it is used in 14% (GS CDM) of the projects. The Voluntary Carbon Standard (VCS) is the second most used standard in our survey. The VCS alone is used in 18% of cases and in combination with the Climate, Community & Biodiversity Standard (CCBS) it is applied in 14% and in combination with the Social Carbon Standard in 2% of cases. The CDM alone is used in only 5% of the projects surveyed. We find that 48% of the projects have a dual certification (GS CDM, VCS+CCBS or VCS+Social Carbon).

The selection of offsetting standards shows, that companies concentrate on a single standard with a focus on verifying additional sustainability criteria (GS) or strive for dual certification, with one standard verifying GHG impacts (VCS and CDM) and one standard verifying positive social and biodiversity impacts (GS and CCBS). This choice is an indicator that companies

attach importance to additional sustainability benefits of a project, but at a second glance, we see the price of an offset as another decisive factor.

Although Market surveys¹² show that offsets from Forestry and Land Use and Household Devices range in the higher end of market prices, especially VCS+CCBS certified Forestry and Land Use offsets saw an immense price drop in 2018 (Donofrio 2019). Offsets from projects with a VCS+CCBS dual certification even sold for less than VCS only certified offsets. This counter-intuitive price development allows companies to invest in dual certified projects with additional co-benefits, while still paying less than for a single certified project.

The VCS+CCB verification only applies to the Forestry and Land Use project category and therefore does not explain the high demand for offsets from the project category Household devices in our survey (and according to market survey, the second most expensive project category).

Customers pay for premium offsets

Companies either use carbon offsets to achieve their own mitigation targets (Subgroup 1) or offer carbon offsets to their customers (Subgroup 2). Companies in the subgroup 2 can pass on the costs of an offset to their customers, therefore the project categories and offsetting standards (and thus very probably also the price for an offset) used differ between the two subgroups. The data presented in Table 3 shows, that the companies surveyed prefer the project category Forestry and Land Use (56%) when using carbon offsets for their own mitigation targets and the project category Household Devices (52%) when offering carbon offsets to their customers.

Table 3: Preferred offsetting project type by subgroups.

Project types	Energy Efficiency/ Fuel Switching	Forestry and Land Use	Household Devices	Renewable Energy	Waste Disposal
All companies (48 projects)	1 (2%)	18 (38%)	18 (38%)	8 (17%)	3 (6%)
Subgroup 1: 16 companies using offsets for their own mitigation targets (25 projects)	0 (0%)	14 (56%)	6 (24%)	5 (20%)	0 (0%)
Subgroup 2*: 4 companies offering carbon offsets to their customers (23 projects)	1 (4%)	4 (17%)	12 (52%)	3 (13%)	3 (13%)

**Five companies surveyed offer this service (BNP Paribas, BP, Deutsche Bahn, DHL and Shell), although no information on projects supported is available for BNP Paribas.*

¹² <https://app.hubspot.com/documents/3298623/view/63001900?accessId=eb4b1a> (Donofrio et al 2019) & https://www.goldstandard.org/sites/default/files/market_report_2019_hd.pdf

Table 4: Preferred offsetting standard by subgroups.

Offsetting standard	GS	CDM	CDM GS	VCS	VCS + CCBS	VCS + Social Carbon	CCBS	Plan Vivo	ACR
All companies (44 projects)	16 (36%)	2 (5%)	6 (14%)	8 (18%)	6 (14%)	1 (2%)	3 (7%)	1 (2%)	1 (2%)
Subgroup 1: 16 companies using offsets for their own mitigation targets (25 projects)	8 (32%)	1 (4%)	1 (4%)	7 (28%)	4 (16%)	0 (0%)	3 (12%)	1 (4%)	0 (0%)
Subgroup 2*: 4 companies offering carbon offsets to their customers (19 projects)	8 (42%)	1 (5%)	5 (26%)	1 (5%)	2 (11%)	1 (5%)	0 (0%)	0 (0%)	1 (5%)

**Five companies surveyed offer this service (BNP Paribas, BP, Deutsche Bahn, DHL and Shell), although no information on projects supported is available for BNP Paribas.*

The same observation can be made when we look at the preferred standards for each subgroup (Table 4). While the GS is used in the same amount in both subgroups (8 projects each), companies prefer the VCS when using carbon offsets to account for their own mitigation targets but offer projects with a dual (and rather expensive) CDM+GS certification when offering offsets to their customers.

The data in table Table 3 and Table 4 support the argument, that the price for a carbon offset is a major factor and that costs for premium carbon offsets (Household devices and CDM+GS certification) will rather be passed on to customers.

The following Table 5 gives information on all project types, offsetting standards and host countries each company is supporting or is planning to support.

Table 5: Overview of all project types, host countries and offsetting standards supported by the companies surveyed.

Company	Project types	Offsetting Standards	Host countries
Airbus		Gold Standard	n/a
Allianz	Forestry and Land Use	VCS (Verra)	Kenya, DR Congo, Indonesia
AXA	"Axa is planning to offset carbon emission through purchasing blue resilience carbon credits from <i>The Nature Conservancy</i> "		
Banco Santander	n/a	n/a	n/a
BASF	Will use offsetting eventually		

Company	Project types	Offsetting Standards	Host countries
Bertelsmann	n/a	n/a	n/a
BNP Paribas	BNP Paribas Securities Services has launched <i>ClimateSeed</i> , a platform that allows companies and BNP business partners to offset their carbon footprint.		
Bosch Group	Forestry and Land Use Household Devices Renewable Energy	Gold Standard VCS (Verra)	Panama, Philippines “all countries possible in which we have business”
BP	Energy Efficiency/Fuel Switching Forestry and Land Use Household Devices Waste Disposal	Gold Standard Clean Development Mechanism Social Carbon American Carbon Registry VCS (Verra)	India, Brazil, China, Indonesia, Zambia, USA, Mexico
Crédit Agricole	Forestry and Land Use Household Devices	VCS (Verra)	India, Burkina Faso, Kenya, Peru
Daimler	Forestry and Land Use Renewable Energy	Gold Standard Clean Development Mechanism VCS (Verra)	n/a
Deutsche Bahn	Household Devices Renewable Energy	Gold Standard Clean Development Mechanism	Ruanda, India
Deutsche Post DHL Group	Household Devices Renewable Energy Waste Disposal	Gold Standard Clean Development Mechanism	India, Laos, Vietnam, Brazil, Chile, Guatemala, Eritrea, Lesotho
Deutsche Telekom	Household Devices	n/a	India
Enel	Forestry and Land Use	n/a	Colombia, Italy, Brazil
ENI	Forestry and Land Use	VCS (Verra) CCBS (Verra)	n/a
Exor Group	n/a	n/a	n/a
Glencore	Forestry and Land Use	n/a	Colombia
Lufthansa	Forestry and Land Use	Plan Vivo	Nicaragua

Company	Project types	Offsetting Standards	Host countries
Munich Re Group	Household Devices Renewable Energy	Gold Standard	China, Uganda
Nestlé	Forestry and Land Use	n/a	Brazil Mexico
Peugeot	Forestry and Land Use	VCS (Verra)	Brazil
PriceWaterhouse-Coopers	Forestry and Land Use Household Devices Renewable Energy	Gold Standard VCS (Verra) CCBS (Verra)	Canada, Brazil, Kenya, India, South Africa, China, Indonesia, Rwanda, Uganda, Madagascar, Malawi
Reckitt Benckiser	Forestry and Land Use	n/a	British Columbia
Royal Dutch Shell	Forestry and Land Use Household Devices Renewable Energy	VCS (Verra) CCBS (Verra)	USA, Guatemala, Peru, Ghana, DR of Congo, Malawi, Kenya, India, China, Cambodia, Indonesia
Siemens	Will use offsetting eventually		
Total	Forestry and Land Use Household Devices	Gold Standard Clean Development Mechanism VCS (Verra) CCBS (Verra)	India "several countries in Africa"
Volkswagen	Forestry and Land Use Renewable Energy	Gold Standard VCS (Verra) CCBS (Verra)	Columbia, Zimbabwe

Project locations are distributed worldwide, but almost exclusively in developing countries. 39% of the projects are located in Africa, followed by Asia (33%), South America (11%) and Central America (8%). We found 5 cases (9%) where projects were located in North America or Europe.

3 Sector details oil & gas and automotive

In the following, we put a distinct focus on two sectors with a unique character as far as the Scope 1 to 3 emissions profile is concerned and at the same time, they are of key importance in terms of overall emissions. The five companies from the oil & gas sector Shell, BP, Total, ENI and Equinor represent 56% of all GHG emissions of the 44 companies surveyed. The four automotive companies Volkswagen, Daimler, BMW and Peugeot represent 13% of the GHG emissions. Their approach at mitigating or offsetting GHG emissions can have a significant impact (in particular if Scope 3 emissions are included). In the following, we present the mitigation goals and the offsetting approach in both sectors.

3.1 The oil & gas sector

GHG emissions from companies in the oil & gas sector include direct emissions from stationary combustion from engines, turbines and flares (Scope 1) and indirect emissions from the consumption of energy (Scope 2). However, the biggest share of emissions comes from stationary and mobile combustion when the petroleum-based product is used as fuel in cars, trucks or airplanes (Scope 3) (WRI 2004). As a result, Scope 3 emissions from companies in the oil & gas sector exceed Scope 1 and 2 emissions by far. Aggregated GHG emissions of the surveyed companies from the oil & gas sector are 273.6 Mio. tCO_{2e} in Scope 1, 28.8 Mio. tCO_{2e} in Scope 2 and 1,958 Mio. tCO_{2e} in Scope 3. Scope 3 GHG emissions of the five oil & gas companies alone are more than double the total GHG emissions in Germany in 2019 (805 Mio. tCO_{2e}¹³). Table 6 gives an overview of the climate neutrality targets, mitigation actions and offsetting approaches in the oil & gas sector.

Since Scope 3 emissions are not emitted by the oil & gas company directly, Exxon Mobil (headquarter in Irving, Texas and therefore not part of this research), does not even report on Scope 3 emissions, arguing these emissions “are a function of demand and out of its control”.¹⁴

Only BP and Shell set a climate neutrality target for a Scope of emissions (Scope 1 and 2). The GHG mitigation actions of the oil & gas companies are quite similar. All of them emphasize the mitigation potential of increased efficiency in their operations, a switch to low carbon fuels (e.g. switch from oil to natural gas), increased usage of renewable energy and/or renewable fuels and especially carbon capture and storage (CCS).

All surveyed oil and gas companies but Equinor are already using carbon offsets or are planning an increased usage in the future. Shell and BP are offering their business partners and customers to offset GHG emissions from the company’s fuel, to be paid by the customer. Total uses carbon offsets for employee air travel emissions and has suggested in the survey it might follow BP and Shell in offering offsets to their customers. To do so, Total invested in a portfolio of projects (natural carbon sinks) with a potential to issue carbon offsets equivalent to the amount of 5 Mio. tCO_{2e} annually. ENI uses carbon offsets to achieve their mitigation targets in upstream emissions.

Only BP and Total have provided the volume of carbon offsets retired in 2019. BP retired 558,247 carbon offsets, which is equivalent to 0.13% of BPs Scope 3 emissions. Total retired 50,000 carbon offsets corresponding to 0.013 % of the companies Scope 3 emissions. None

¹³ <https://www.umweltbundesamt.de/en/indicator-greenhouse-gas-emissions#assessing-the-development>

¹⁴ <https://www.bloomberg.com/news/articles/2020-04-16/shell-sets-bolder-emissions-goal-even-as-virus-hits-oil-business?sref=Oz9Q3OZU>

of the companies discloses any information about the estimated number of offsets needed in future.

Table 6: Mitigation targets and offsetting approach in the oil & gas sector.

Oil and gas company	Shell	BP	Total	ENI	Equinor
Climate Neutrality target	Net-zero emissions energy business (Scope 1+2) by 2050 the latest.	Net-zero company (Scope 1+2) by 2050 or sooner	Net Zero across Total's worldwide operations by 2050 or sooner (scope 1+2)	No	No
GHG emissions (Mio tCO₂e)	Scope 1: 70 Scope 2: 10 Scope 3: 576	Scope 1: 95,3 Scope 2: 11,1 Scope 3: 437	Scope 1: 50 Scope 2: 4 Scope 3: 400	Scope 1: 43,4 Scope 2: 0,67 Scope 3: 231	Scope 1: 14,9 Scope 2: 3 Scope 3: 314
Mitigation actions for reducing Scope 3 emissions	Until 2050, reduce by 65% Increase the proportion of lower-carbon products (natural gas, biofuels, electricity and hydrogen) in the mix of products CCS Offsetting	Until 2050, reduce by 50% Provide lower emissions gas and develop more efficient and lower carbon fuels, lubricants and petrochemicals (e.g. <i>BP Biojet</i> made from recycled cooking oils) Offsetting	Net Zero in Europe by 2050 or sooner (scope 1+2+3) Growing presence further downstream in the gas value chain. (instead of oil) Energy efficiency consulting service for customers	Low-carbon energy portfolio (natural gas and renewables) CCS	Maintain the competitiveness of oil and gas with CCS Decarbonisation of natural gas through hydrogen value chains, and low carbon fuel transportation solutions
Offsetting approach	Offer carbon offsetting to business partners and customers (Scope 3).	Allow businesses and other organizations to offset their carbon footprint through BP's carbon trading business (Scope 3).	Offsetting at least employee air travel Invested in natural carbon sinks with a storage capacity of 5 million tons of carbon p.a.	ENI will use offsets to achieve upstream activity mitigation goals.	n/a

3.2 The automotive sector

Like in the oil & gas sector, the main share of GHG emissions from companies in the automotive sector comes from Scope 3 emissions. Daimler does not disclose information about their Scope 3 emissions in their sustainability report, but does so in a separately accessible document¹⁵. The company states that 73% of the company's Scope 3 emissions are generated during the utilization phase of the car. This includes the production of fuel and the operating of the car (in other words, use of fuel as propellant). Peugeot reports that 75% of their Scope 3 emissions are generated through fuel extraction and consumption. Both the automotive sector and the oil & gas sector include the same source of emission (use of petroleum-based fuels) in their Scope 3 reporting.

Table 7: Mitigation targets and offsetting approach in the automotive sector.

Automotive Sector	Volkswagen	Daimler	BMW Group	Peugeot
Climate Neutrality target	Volkswagen intends to be a carbon neutral company until 2050. This includes Scope 1, 2 and 3 emissions.	Become CO ₂ -neutral by 2039	No	Guarantee the carbon neutrality of the Group's plants (zero CO ₂ emissions) by 2050
GHG emissions (Mio tCO₂e)	Scope 1: 3.9 Scope 2: 4.3 Scope 3: 428	Scope 1: 1.3 Scope 2: 1.7 Scope 3: 79.2	Scope 1: 0.6 Scope 2: 0.5 Scope 3: 73.1	Scope 1: 0.8 Scope 2: 0.4 Scope 3: 6.1
Mitigation actions for reducing Scope 3 emissions	Increased efficiency of ICE cars Electrification of the new car fleet	Increased efficiency of ICE cars Electrification of the new car fleet	Increased efficiency of ICE cars Electrification of the new car fleet	Increased efficiency of ICE cars Electrification of the new car fleet
Offsetting	Yes	Yes	No	Maybe
Offsetting approach	Offsetting of all production related emissions of the new electric car ID.3. Offsets are needed "in the millions" in the coming years.	Daimler will offset the CO ₂ emissions from their gas-fired cogeneration plants (combined heat and power).	n/a	Use carbon offsets to guarantee the carbon neutrality of the group's plants if residual emissions exist.

Table 7 gives an overview of the climate neutrality targets, mitigation actions and offsetting approach in the automotive sector (for a more detailed list please see the Annex). We observe

¹⁵ <https://www.daimler.com/documents/sustainability/other/2018-scope-3.pdf>

that only Volkswagen sets a company-wide climate neutrality target. All companies from the automotive sector aim at mitigating their GHG emissions by increasing the efficiency of their automobiles sold with an internal combustion engine (ICE). All four companies also plan to offer their new car fleets as e-vehicles. Volkswagen is planning to use a significant amount of carbon offsets in the future to offset all GHG emissions linked to the production of their new model ID.3. Daimler will offset the CO₂ emissions from their gas-fired cogeneration plants and Peugeot might use carbon offsets if mitigation targets cannot be met otherwise.

The core mitigation strategy, the electrification of the new car fleet, will significantly change the distribution of emissions in the individual emission Scopes in the automotive sector. While today most of the GHG emissions are generated during the use phase of the car (Scope 1), GHG emissions in the future will mainly be generated during the production of batteries and battery cells for e-vehicles (Scope 1 and 2) (Ellingsen 2013).

4 Conclusions and recommendations

In this study, we examined the climate mitigation targets of 44 large companies in Europe and the role carbon offsetting plays to achieve the mitigation targets.

Almost all companies publish climate mitigation targets and **half of the companies' surveyed declared a climate neutrality or net-zero target.**

- However, the proposed climate mitigation targets of the companies surveyed until 2030 are weak and the companies seem to postpone the main task ahead into the period after 2030.
- For a climate-neutral society in 2050, the long-term goals of the companies are not sufficient as of yet.
- Several companies are formulating stricter climate targets for the European market, showing that legislation committed to the goals of the Paris Agreement supports more ambitious climate mitigation targets in the private sector.
- Although half of the companies surveyed set a climate-neutrality target, the mayor share of emissions (Scope 3) is mostly excluded. Scope 3 emissions exceed Scope 1 and 2 emissions often considerably. Climate targets need to be carefully reviewed in order to avoid giving companies a chance to greenwash.
- For a thorough assessment of a company's climate mitigation strategy in light of international agreements and/or national targets, further research with a focus on the share of carbon offsets on total GHG emissions beyond the data available in published reports is necessary. In addition, guidance is needed how a good practice of reporting looks like and may encourage sector partners (i.e. competitors) to also engage in climate mitigation action.

We found that **carbon offsetting is a vital instrument** for companies, which set a climate-neutrality target. This may lead to an increased demand for carbon offsets in the future.

- 83% of companies, which declared a climate neutrality target, plan to use carbon offsets to achieve their target.
- Ambitious goals of a direct competitor can/may drive commitments to climate neutrality sector wide. During the course of this research, two companies from the oil & gas sector (Shell and Total) representing a combined share of 27.6% of the GHG emissions from the companies surveyed, announced a climate-neutrality target. The companies are following their direct competitor BP, who announced its climate neutrality target in February of this year. All three companies will use carbon offsets to achieve their climate neutrality target.
- Only 18% of companies report the amount of carbon offsets they retired during the last year. This seems to be insufficient to provide reliable estimates and forecasts of the demand of carbon offsets for market participants.
- Based on the information available, we estimate the demand for carbon offsets by the companies surveyed to be 17.5 Mio tCO_{2e} in 2020 and almost double the amount of 32.2 Mio tCO_{2e} in 2030 (excluding BP (for own mitigation targets) and Shell).
- Offsetting can also be a major instrument to achieve climate mitigation targets in the private sector after 2030, though the lack of clear strategies by the companies makes it currently impossible to estimate a post 2030 demand. However, several companies keep their options open by investing in their own offsetting projects today.

Companies focus on the project types Forestry and Land-Use and Household Devices.

The Gold Standard is the most popular standard among the companies surveyed.

- Companies today prefer the project types Forestry and Land-Use (38%) and Household Devices (38%) when choosing an offsetting project. The third most supported project type are Renewable Energy projects (17%).
- The Gold Standard is the favored offsetting standard among all companies surveyed. It is used in 36% of offsetting projects and in combination with the CDM in 14% of projects. Followed by the VCS, which is used in 18% of projects and in a dual certification in another 16% of projects. 48% of companies choose projects with a dual certification.
- Companies have an interest in additional co-benefits of a carbon offsetting project but are more likely to pass on higher costs of premium offsets to their customers.

The public sector should ensure the credibility of long-term climate targets and the voluntary offsetting of greenhouse gas emissions by companies. Selected starting points for this are:

- Many companies are excluding the biggest share of GHG emissions from their reporting or when setting climate mitigation targets. This makes it rather difficult for interested consumers or employees to understand and assess the real ambitions of a company. This may be achieved more efficiently by imposing stronger governance rules.
- Companies' climate mitigation targets for the next decade are weak and postpone the necessary change. Companies that set comprehensive climate targets or participate in existing initiatives such as the Carbon Disclosure Project or the Science-based targets Initiative should be encouraged and supported as frontrunners in order to increase public pressure on other companies in the respective sector.
- In order to avoid possible greenwashing, the use of carbon offsets without real climate benefits, or a potential double claiming of emissions reductions, companies must report transparently and comprehensively on their use of carbon offsets. This includes the type of project and standard, the amount of emissions reductions cancelled in the reporting year, proof of cancellation or retirement and clear and strict accounting rules either laid down by the legislator or defined by established reporting standards.

5 Annex

5.1 Sector: Oil & gas

BP		Climate Neutrality claim: Net-zero company (Scope 1+2) by 2050 or sooner	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 95.300.000	Net zero across BP's operations on an absolute basis by 2050 or sooner.	Offer lower emissions gas	Allow businesses and other organizations to offset their carbon footprint through BP's carbon trading business (Scope 3).
Scope 2: 11.100.000	Net zero on carbon in BP's oil and gas production on an absolute basis by 2050 or sooner.	Develop more efficient and lower carbon fuels, lubricants and petrochemicals	BP and its customers offset 1.2 million tonnes of carbon in 2019 through BP Target Neutral.
Scope 3: 437.000.000	50% cut in the carbon intensity of products BP sells by 2050 or sooner.	Grow lower carbon offers for customers	
	Reduce methane intensity of operations by 50% by 2023.	Expand low carbon and renewable businesses	
	Zero net growth in operational emissions out to 2025	\$500 million invested in low carbon activities each year	
	3.5Mte of sustainable GHG reductions by 2025	Collaborate and invest in the OGCI's \$1bn+ fund for research and technology	
	Targeting methane intensity of 0.2 %	Carbon capture, use and storage	
		Growing our renewables business	
		Included our sustainable emissions reduction target in the annual bonuses of eligible employees	
ENI		Climate Neutrality claim: Achieve net carbon neutrality of our upstream sector by 2030	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 43.350.000	43% GHG upstream emission intensity at 2025	Increased efficiency	ENI will use offsets to achieve upstream activity mitigation goals. Annual need for carbon offsets will depend on the grade of achievement of the company's 43% reduction target until 2025.
Scope 2: 670.000	Zero process flaring at 2025	Forestry projects	
Scope 3: 231.000.000	80% UPS fugitive methane emission at 2025	Growing share of gas	
	Net zero carbon footprint on direct emissions of upstream activities (in equity) at 2030	Growth in zero carbon sources	
	Expected installed power from renewable sources of 5 GW in 2025	CCUs (CO ₂ capture and utilization).	
		Spending in decarbonization, circular economy and renewables	

Equinor		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets:	Mitigation Measures	Offsetting
Scope 1: 14.900.000	By 2030, 3 million tonnes less annual CO ₂ emissions compared to what they would have been, had no reduction measure been implemented between 2017 and 2030, including our offshore operations in Norway (Konkraft target, 2 million tonnes of CO ₂ per year by 2030 compared to 2020).	Build a high value and low-carbon oil and gas portfolio Create a material industrial position in new energy solutions Invest in low-carbon research and technology Accountability and collaboration to amplify climate reaction.	n/a
Scope 2: 3.519.000			
Scope 3: 314.000.000			
Royal Dutch Shell		Climate Neutrality claim: Become a net-zero emission energy business by 2050 or sooner (Scope 1+2).	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 70.000.000	Reduce Net Carbon Footprint by increase of energy efficiency, use of lower-carbon energy, store remaining emissions (2016 baseline): - 2 to 3% by 2021 - 3 to 4% by 2022 - 30% by 2035 - 65% by 2050 (2016 baseline = 79 gCO ₂ e/MJ) Maintain methane emissions intensity below 0.2% by end of 2025	Reduce emissions through leaks, from our operations, throughout gas industry Increase use of lower-emission energy products, including natural gas, biofuels, hydrogen and renewable power Aim to invest more in natural ecosystems to help drivers and businesses offset their carbon emissions	Shell is offering carbon offsets (“natural sinks”) to business partners and customers (Scope 3). Carbon offsets will play a role in achieving Shell’s Scope 3 target. Shell does not publish the amount of carbon offsets issued or cancelled.
Scope 2: 10.000.000			
Scope 3: 576.000.000			
Total		Climate Neutrality claim: Net Zero across Total’s worldwide operations by 2050 or sooner (scope 1+2)	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 50.000.000	Net Zero across Total’s worldwide operations by 2050 or sooner(scope 1+2) Net Zero across all its production and energy products used by its customers in Europe by 2050 or sooner(scope 1+2+3) 60% or more reduction in the average carbon intensity of energy products used worldwide by Total customers by	Avoid emissions and reduce emissions: Energy efficiency, a key driver to reduce emissions; Strengthen the integrated business model that emphasizes natural gas Expanded presence in low-carbon electricity and decarbonizing of fossil fuels	Total is offsetting employee air travel and my include offsetting in their product offers if customers request it. Total offset 50.000 tCO ₂ e in 2018 for their employee air travel.
Scope 2: 4.000.000			
Scope 3: 400.000.000			

<p>2050(less than 27.5 gCO₂/MJ)-with intermediate steps of 15% by 2030 and 35% by 2040(scope 1+2 +3)</p> <p>Ambition to achieve scope 3 average carbon intensity of less than 27.5 GCO₂/MJ by 2050</p> <p>Renewable generation gross capacity of 25 GW in 2025</p>	<p>Carbon storage through forests and carbon capture, utilization and storage (CCUS)</p>	<p>The company invested in natural carbon sinks with a storage capacity of 5 million tons of CO₂e.</p>
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5.2 Sector: Automotive

BMW	Climate Neutrality claim: No climate neutrality target for the company.		
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
<p>Scope 1: 581.703</p> <p>Scope 2: 538.622</p> <p>Scope 3: 73.093.077</p>	<p>Reduced by at least 50% in the European new vehicle fleet (base year 1995)</p>	<p>Supply all worldwide locations completely with energy from renewable sources in 2020</p> <p>Focus on both increasingly efficient, clean combustion engines and electro mobility</p> <p>Lowering emissions with efficiency technologies and solutions for pollutant reduction</p> <p>Expanding our electric mobility vehicle portfolio</p> <p>Facilitating rapid charging and improving access to charging stations</p>	<p>No use of carbon offsets.</p>
Daimler	Climate Neutrality claim: Become CO ₂ -neutral by 2039		
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
<p>Scope 1: 1.247.000</p>	<p>Production facilities to be carbon-neutral by 2022 (Europe) and 2039 (World)</p>	<p>Obtain electrical energy exclusively from renewable sources in the future</p>	<p>Daimler will offset the CO₂ emissions from their gas-fired</p>

Scope 2: 1.687.000 Scope 3: 79.200.000	<p>Reduction of 44 % CO₂ emissions for cars in new-vehicle fleet in the EU (2007-2021)</p> <p>Sales structure in which plug-in hybrids and all electric drive systems account for more than 50% of our portfolio by 2030 and a carbon neutral new vehicle fleet until 2039</p> <p>Reduction of absolute CO₂ emissions at European factories by 20% and specific CO₂ emissions by 66% by 2020 (base year 1990).</p> <p>Reduction of specific CO₂ emissions (per vehicle) at production facilities worldwide by 40% by 2020 as compared to 2007</p> <p>Vans targeted at private customers are to be CO₂-neutral over the entire lifecycle by the year 2039</p> <p>Daimler Trucks & Buses to become CO₂-neutral with regard to driving operation (tank-to-wheel) by 2039 and facilities in Europe to achieve CO₂- neutral production by 2022</p>	<p>Plans call for all manufacturing facilities in Germany to be supplied with CO₂-neutral energy by 2022</p> <p>Offer a completely CO₂-neutral new vehicle fleet by 2039</p> <p>Alternative Fuels: Fuel roadmap points the way toward the optimization of today's fossil fuels and the use of natural gas-based fuels, synthetic fuels and biofuels, as well as hydrogen and electricity generated from renewable sources. In the future, renewably produced synthetic fuels can also make an additional contribution to achieving the climate targets</p>	<p>cogeneration plants (combined heat and power).</p> <p>We estimate that Daimler will offset around 780,000 tCO₂e annually.</p>
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Peugeot		Climate Neutrality claim: Guarantee the carbon neutrality of the Group's plants (zero CO ₂ emissions) by 2050	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 878.013 Scope 2: 435.943 Scope 3: 6.153.000	<p>Production facilities to be climate neutral until 2050.</p> <p>The Group has publicly committed to reducing the average CO₂ emissions level of its vehicles marketed globally between 2012 and 2025 by 30% and to further reduce these levels by 55% by 2035.</p> <p>Reduce average CO₂ emissions of vehicles sold worldwide by 55% compared with 2012 levels.</p> <p>Electrification plan: 50% of vehicles to be electrified by 2021 and 100% by 2025</p> <p>Prepare to reduce CO₂ emissions average of sold vehicles in Europe in 2020 with a Q4-2019 CO₂ emission average lower than 2018 (114.1 g/km) for produced passenger cars.</p>	<p>Cutting CO₂ vehicle emissions is a top priority</p> <p>23 Low Emission Vehicle (LEV) launches in Europe and 8 in China in 2021</p> <p>100% of the models marketed by 2025 will offer an electrified version alternative</p> <p>Close collaboration and innovation with suppliers to improving the environmental performance of the supply chain</p> <p>Improved manufacturing processes to reduce CO₂ emissions of the production phase</p> <p>Reducing the carbon impact of Groupe PSA logistics practices</p>	<p>Use carbon offsets to guarantee the carbon neutrality of the group's plants if residual emissions exist.</p>

Volkswagen		Climate Neutrality claim: The objective is the complete decarbonisation of the Group by 2050. This includes Scope 1, 2 and 3 emissions.	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 3.910.000 Scope 2: 4.300.000 Scope 3: 427.529.210	<p>Reduction of GHG emissions from energy supply to production facilities in Germany by 40% per unit produced by 2020 (compared with 2010 baseline).</p> <p>By 2025, the CO₂ emissions of all plants per vehicle is to be reduced by 50% compared to 2010.</p> <p>As early as by 2025, the carbon footprint of the vehicle fleet with passenger cars and light commercial vehicles is to be reduced by 30% compared to 2015.</p> <p>By 2030, the Group sites should emit 16% less CO₂ in absolute terms compared to the base year of 2018.</p>	<p>Volkswagen Group measures progress in the reduction of CO₂ emissions with a decarbonization index (DCI).</p> <p>By 2028, be a world leader for e-mobility and launch to 70 new electrified models around the world and sell 22 million electric vehicles by then</p> <p>Increasing energy efficiency and raising the proportion of renewable energies in electricity supply</p> <p>Fund projects making a contribution to reducing GHG emissions with an internal CO₂ fund. €25 million per year is currently available for this.</p> <p>Carbon-Neutral Plants</p> <p>Go to Zero Impact Logistics: Emissions are reduced through the continuous optimization of the production and transport network</p> <p>Increasing energy efficiency and raising the proportion of renewable energies in our electricity supply.</p>	<p>The remaining emissions from ID.3 production will initially be offset through climate protection projects, although the intention is to gradually reduce this.</p> <p>This will require “several millions tons of carbon offsets” in the coming years.</p>

5.3 Sector: Energy

Electricité France		Climate Neutrality claim: Committed to achieve carbon neutrality by 2050	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 34.900.000 Scope 2: 470.000 Scope 3: 110.800.000	<p>Reducing the group's direct CO₂ emissions to under 30 Mt in 2030 (Scope 1)</p>	<p>Cutting CO₂ emissions from generation asset portfolio, R&D for future generation fleet and energy systems, optimising thermal power plants, integrating renewable energies, work on smart electricity systems.</p> <p>Increased transparency: Task Force on Climate Related Disclosures - TCFD</p>	<p>No use of carbon offsets.</p>

Enel		Climate Neutrality claim: Decarbonize by 2050.	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 94.800.000	Goal of reducing specific CO ₂ emissions by 2030 (0.23 kg/kWheq), in addition to the previous target for 2020 (< 0.35 kg/kWheq)	Envisaging additional capacity from renewable sources of 11.6 GW (including managed capacity), which will bring total renewable capacity to a value of 53.9 GW by 2021 and consequently an increase in emission-free production to 62%, compared to the current figure of 51%, up over 2017 (equal to 45%).	Enel uses carbon offsets to offset GHG emissions for some events.
Scope 2: 1.090.000	Targets for 2021 (base year 2007):		Enel offset 187 tCO ₂ e in 2018. Enel makes no statement about a future demand for carbon offsets.
Scope 3: 6.780.000	Renewable capacity (% of total) 55%		
	Emission-free generation (% incidence on the total): 62%		
	Net renewable energy production of 132 TWh		
	Specific CO ₂ emissions of 0.345 kg/kWheq		
	Targets for 2030:		
	Specific CO ₂ emissions of 0.23 kg/kWheq		
Uniper		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 59.500.000	Group-wide carbon intensity of 500g of CO ₂ per kWh (on average) through 2020.	Promote lower carbon fuels for power generation	No use of carbon offsets.
Scope 2: 270.000	Conduct, by 2022, at least 20 projects whose aims include decarbonization.		
Scope 3: 10.300.000	Uniper's decarbonization strategy focuses primarily on its direct emissions (Scope1).		

5.4 Sector: Retail / Consumer goods / Food and Beverages

Carrefour		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 1.025.000	40% reduction in its CO ₂ emissions by 2025, and a 70% reduction by 2050, with respect to base year 2010 This target breaks down into several sub-targets: 30% reduction in energy consumption by 2025 with respect to 2010 40% reduction in refrigerant-related CO ₂ emissions by 2025 with respect to 2010 30% reduction in transport-related CO ₂ emissions by 2025 with respect to 2010	Internal carbon price used in new investment proposals	No use of carbon offsets.
Scope 2: 1.494.000		Provide customers and employees with information on good energy saving practices in stores	
Scope 3: 348.400		Development of new responsible transport solutions, for city-centre deliveries in particular Scope 3 Climate Action Plan on downstream goods transport, goods, with an emphasis on agricultural produce - objective of having the ten biggest Carrefour suppliers adopt approaches consistent with the Science Based Targets initiative, and its 30 biggest suppliers take up a climate commitment by 2025.	
Nestlé		Climate Neutrality claim: Net-zero GHG emissions pledge by 2050	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 3.300.000	Aim to procure 100% of electricity from renewable sources within the shortest practical timescale. By 2020, reduce GHG emissions (Scope 1 and 2) by 35% in our manufacturing operations versus 2010. By 2020, reduce GHG emissions per tonne of product by 10% in our distribution operations versus 2014. By 2020, reduce GHG emissions by 10% in the 100 major warehouses we use versus 2014.	Reduce emissions across the value chain by operating more efficiently and using more sustainably managed and renewable resources.	No use of carbon offsets.
Scope 2: 2.500.000		Promoting a sustainable Swiss dairy industry through the Climate-Friendly Milk pilot project	
Scope 3: n/a		Reduce GHG emissions in manufacturing, distribution operations and warehouses Expand the use of natural refrigerants.	

Reckitt Benckiser		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 148.214	Energy and production efficiency programmes: reduce GHG emissions (per unit of production) by 40% in own manufacturing sites and warehouses by 2020 1/3 reduction in carbon footprint “per dose” (meaning per unit of product) by 2020 versus 2012	Control GHG emitted from product manufacturing	No use of carbon offsets.
Scope 2: 247.856		Improve energy efficiency from Transportation and logistics	
Scope 3: n/a		Carbon offset programme: While reducing emissions and switching energy sources, also consider offsetting through ‘Trees for Change’ carbon offset programme from 2006 to 2015	
Tesco		Climate Neutrality claim: Aim to become carbon neutral by 2050.	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 1.252.038	Reduce absolute carbon emissions from Tesco’s operations, from 2015/16 levels: 35% by 2020 60% by 2025 100% by 2050 Source 100% of electricity from renewable sources by 2030	Reduce emissions associated with the distribution of products by maximising the efficiency of deliveries, using all the space in vehicles where possible and minimise distances travelled	No use of carbon offsets.
Scope 2: 916.616		Help customers cut transport emissions by developing the largest UK retail Electrical Vehicle (EV) charging network	
Scope 3: 819.984		Multi-pronged approach towards reaching renewable energy goal, incl. renewable energy certificates, generate renewable electricity on-site and near-site sources, power purchase agreement	
Unilever		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 731.927	Halve the GHG (GHG) impact of products across the lifecycle by 2030 By 2020 CO ₂ emissions from energy from factories will be at or below 2008 levels despite significantly higher production volumes	Become carbon positive in manufacturing: source all energy renewably, source grid electricity renewably, eliminate coal from energy mix, make surplus energy available to communities	No use of carbon offsets.
Scope 2: 827.091		Reduce GHG from washing clothes: reformulation, reduce GHG from transport, from refrigeration, reduce energy consumption in offices, reduce employee travel	
Scope 3: 60.982.508			

5.5 Sector: Production Industry / Suppliers / Chemical Companies

Air Liquide		Climate Neutrality claim: n/a	
GHG-emissions (tCO ₂ e)	Targets	Mitigation Measures	Offsetting
Scope 1: 15.390.000	Commitment to reduce its carbon intensity by 30% between 2015 and 2025	Reduce the carbon intensity of assets and customers towards a sustainable industry Offering technologies like oxy-combustion	No use of carbon offsets.
Scope 2: 12.422.000			
Scope 3: 210.000			
ArcelorMittal		Climate Neutrality claim: Ambition to reduce CO ₂ emissions by 2050 and, in Europe, to achieve carbon neutrality by this date.	
GHG-emissions (tCO ₂ e)	Targets	Mitigation Measures	Offsetting
Scope 1: 173.950.000	n/a	Circular carbon technologies Clean power technologies Energy efficiency Comprehensive climate-related disclosure	No use of carbon offsets.
Scope 2: 14.070.000			
Scope 3: 14.790.000			
BASF		Climate Neutrality claim: n/a	
GHG-emissions (tCO ₂ e)	Targets	Mitigation Measures	Offsetting
Scope 1: 15.855.000	CO ₂ -neutral growth until 2030: Annual GHG emissions compared with baseline 2018 (BASF operations excluding sale of energy to third parties, including offsetting)	Purchasing low- carbon energy Research and development program to reduce GHG emissions over the long term Reconciling climate protection and growth Further improving process and energy efficiency Increasing use of renewable energy	BASF considers temporarily taking external offsetting measures if a stabilization of emissions at the 2018 level is not otherwise achieved.
Scope 2: 3.519.000			
Scope 3: 100.000.000			

Bosch Group		Climate Neutrality claim: Make emissions in direct sphere of influence (scope 1 and 2) climate neutral worldwide.	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 466.000 Scope 2: 2.792.000 Scope 3: n/a	<p>Taking 2007 as the baseline year and relative to the added value, CO₂ emissions company-wide are to be reduced by 35 percent by 2020.</p> <p>By 2030, Bosch wants to save 1,700 GWh of energy and generate 400 GWh of its energy needs itself from renewable sources.</p>	<p>Save 1,700 GWh of energy by 2030</p> <p>Generate 400 GWh of energy needed from renewable sources</p>	<p>As an industrial company, a complete renunciation of offsetting will not be possible in the foreseeable future to reach climate neutrality.</p> <p>Achieve 2020 target by offsetting 1/3 of its GHG emissions from energy use.</p>
Continental AG		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 900.000 Scope 2: 2.400.000 Scope 3: 111.770.000	<p>By 2020, reduce the specific CO₂ emissions by 20% in relation to adjusted sales using 2013 as base year</p>	<p>Make a material contribution to sustainable environmental protection – especially climate protection – over the entire product life cycle.</p> <p>Continuously improve our environmental performance through the systematic application of management systems</p>	<p>No use of carbon offsets.</p>
Glencore		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 18.488.000 Scope 2: 11.810.000 Scope 3: 313.071.000	<p>Group-wide carbon emission intensity reduction target of at least 5% on 2016 levels by 2020.</p>	<p>Seek regulatory approval to test inject (CCS) up to 180,000 tons of CO₂ over three years, equivalent to storing/removing emissions from 10,000 Queensland households.</p> <p>Restoration of hydroelectric plant in DRC, use of EVs in mining operations, etc.</p>	<p>The Prodeco coal asset is participating in a carbon offsetting programme.</p> <p>No information available about the amount of offsets purchased by Prodeco coal.</p>

Saint Gobain		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 8.600.000 Scope 2: 3.100.000 Scope 3: n/a	Reduce carbon emissions by 20% until 2025 (base year 2010).	<p>Use of recycled raw materials in processes</p> <p>Reduce energy consumption, particularly for glass fusion. Energy efficiency as essential factor. Energy audits and improving the insulation of the Group's production facilities.</p> <p>Optimize energy use in response to needs (usage of power engines, lighting or the use of compressed gas) and the recovery of energy from our manufacturing processes.</p> <p>Measuring carbon benefits of products and solutions</p> <p>Internal carbon price to speed up the transition to low-carbon technologies</p> <p>"Improving CO₂ footprint" cross-business R&D program; Scope 3 control.</p> <p>Stakeholders: Strong climate commitments; Actions for a strong, low-carbon economic growth; Training customers locally, keeping end users informed;</p> <p>Commit to a 2°C scenario.</p>	No use of carbon offsets.
Siemens		Climate Neutrality claim: Siemens plans to become carbon-neutral for Scope 1 and 2 emissions. Scope 3 emissions are not included in its carbon neutral commitment.	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 768.000 Scope 2: 512.000 Scope 3: 16.005.000	Planned to halve the footprint of own operations by 2020 as compared with 2014	<p>Drive Energy Efficiency Program and reduce fleet emissions</p> <p>Increase the share of renewable energy and accelerate switch from the remaining conventional electricity generation to low-carbon fuels</p> <p>Use energy as efficiently as possible</p> <p>Redesign electricity markets to ensure sufficient investment into a sustainable, secure and energy-efficient system</p> <p>Accelerate the uptake of highly flexible technologies grate renewable energies and ensure system stability</p> <p>Accelerate the decarbonization of other sectors with integration, including Power-to-X technologies.</p>	Siemens will use carbon offsets for their carbon neutral program eventually, if other measures do not achieve the planned reductions in emissions.

Thyssen Krupp		Climate Neutrality claim: Long-term target to be climate-neutral by 2050	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 21.800.000	By 2030 reduce direct emissions (scope 1) and emissions from the purchase of energy (scope 2) by 30% (base year 2018). Indirect emissions in the value chain, to be reduced by at least 16%. Combined target Scope 1+2= 30% by 2030 Scope 3 reduction target -16% by 2030	Increase energy efficiency – from the supply chain to internal production and manufacturing processes to products Climate Action Program for Sustainable Solutions: Decrease emissions associated with own production Improve energy efficiency Replace carbon step by step with hydrogen as a reducing agent in steel production and avoid the production of CO ₂ Pursue a CCU approach (Carbon Capture and Usage) and capture CO ₂ and convert it into base chemicals using the Carbon2Chem process	No use of carbon offsets.
Scope 2: 1.300.000			
Scope 3: 500.000			

5.6 Sector: Insurance / Banking / Investment

Allianz		Climate Neutrality claim: Carbon-neutral since 2012, achieved by offsetting all GHG emissions.	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 46.734	Sourcing 100% renewable power by 2023 Reduce GHG emissions by 30% per employee by 2020 (2010 baseline)	Commit to sourcing 100% renewable power for our group-wide operations by 2023.	Offset all GHG emissions that cannot be otherwise mitigated. In 2018, Allianz retired 373,448 carbon credits.
Scope 2: 239.132			
Scope 3: 167.533			

Assicurazioni Generali		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 23.824	Decarbonize the portfolio to net-zero emissions by 2050	Invest 3.5 Billion € in new green investments by 2020	No use of carbon offsets.
Scope 2: 9.780	Reduce CO ₂ emissions by 20% by 2020 (base year 2013)	Increase the offer of products with environmental value	
Scope 3: 36.092	Divesting from coal activities	Increase premiums from social and green products by 7%-9% and allocate € 4.5 billion for green and sustainable investments by the end of 2021.	
AXA		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: n/a	Reduce CO ₂ emissions per Full-Time Employee (FTE) by 25% until 2020	Responsible investment and underwriting policy	Axa is planning to offset GHG-emissions
Scope 2: n/a		Reduction in the Group's carbon footprint	
Scope 3: n/a		Monitoring its investments' alignment with a "2°C" scenario.	
Banco Santander		Climate Neutrality claim: Become carbon neutral in 2020 by offsetting all emissions generated by own operations	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 22.691	60% of electricity used from renewable energy sources by 2022 and 100% by 2025	Aim to raise or facilitate the mobilization of 120Bn euros between 2019 and 2025, and 220Bn euros between 2019 and 2030 in green finance to help tackle climate change.	Offset all GHG emissions by own operations (Scope 1+2)
Scope 2: 322.038			
Scope 3: 120.969			
BNP Paribas		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: n/a	Goal for 2020 is to achieve a 25% reduction in employee emissions	Measuring and monitoring the climate impact of its loan portfolio, in accordance with the Paris Agreement.	BNP Paribas Securities Services launched ClimateSeed, a platform
Scope 2: n/a		Encouraging sustainable mobility	

Scope 3: n/a	Support climate-research programmes with \$15 Mio. New sustainable-finance solutions for companies through corporate and institutional banking business Sustainability-linked loans (SLL), interest rates linked to achievement of SDGs or environmental and social criteria	that allows business partners to offset their carbon footprint.
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Crédit Agricole			
Climate Neutrality claim: n/a			
GHG-emissions (tCO ₂ e)	Targets	Mitigation Measures	Offsetting
Scope 1: n/a	Reduce Scope 1 emissions by 15% between 2016-2020	n/a	Offset energy and business related emissions through 2040. Crédit Agricole S.A. and its subsidiaries have offset 59,426 tonnes of CO ₂ (energy and transport emissions) in 2018.
Scope 2: n/a			
Scope 3: n/a			

Exor Group			
Climate Neutrality claim: n/a			
GHG-emissions (tCO ₂ e)	Targets	Mitigation Measures	Offsetting
Scope 1: n/a	n/a	n/a	n/a
Scope 2: n/a			
Scope 3: n/a			

HSBC Holdings			
Climate Neutrality claim: n/a			
GHG-emissions (tCO ₂ e)	Targets	Mitigation Measures	Offsetting
Scope 1: n/a	n/a	Task force on Climate-related Financial Disclosures ('TCFD') Provide \$100bn of sustainable finance, facilitation and investment by 2025.	No use of carbon offsets.
Scope 2: n/a			
Scope 3: n/a			

Munich Re Group		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 45.730	Reduce CO ₂ emissions by 35% until 2020 (basis year 2009)	Reducing energy consumption and the associated carbon emissions	The company offsets unavoidable carbon emissions. 103.000 carbon offsets retired in 2018.
Scope 2: 31.713		Ensuring that business travel is as environmentally friendly as possible	
Scope 3: 25.581		Achieve a higher level of material and resource efficiency Sustainability in investment: Expansion of climate-friendly investment in infrastructure projects such as solar parks and wind farms Long-term objective: Expansion to € 2.8 bn.	

5.7 Sector: Logistics / Aerospace / Transportation

Airbus		Climate Neutrality claim: Ambition to achieve climate neutrality in Scope 1 and 2 emissions.	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 553.063	Improve fleet fuel efficiency by an average of 1.5% per annum between 2009 and 2020	Improve fleet fuel efficiency by an average of 1.5% per annum between 2009 and 2020	To achieve the climate neutrality goal, Airbus will offset emissions that cannot be avoided or reduced. Since 2020, Airbus offsets all GHG-emissions from business travel (10% off all GHG-emissions) and investigates into which areas offsetting should be extended.
Scope 2: 412.570	From 2020, net carbon emissions from aviation will be capped through carbon neutral growth (CNG) and by 2050, net aviation carbon emissions will be half of what they were in 2005.	From 2020, net carbon emissions from aviation will be capped through carbon neutral growth (CNG) and by 2050, net aviation carbon emissions will be half of what they were in 2005.	
Scope 3: 279.166	Airbus sites to reduce energy consumption by 20% and absolute CO ₂ emissions by 40% by 2030 compared to 2015 (includes Scope 1+2 and Scope 3 emissions from volume transports, part of the CO ₂ emissions resulting from volume transport will be offset).	Airbus sites to reduce energy consumption by 20% and absolute CO ₂ emissions by 40% by 2030 compared to 2015 (includes Scope 1+2 and Scope 3 emissions from volume transports, part of the CO ₂ emissions resulting from volume transport will be offset).	

Deutsche Bahn		Climate Neutrality claim: Become a climate-neutral group until 2050.	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 3.830.000 Scope 2: 4.270.000 Scope 3: 12.710.000	<p>Halving specific GHG emissions by 2030 compared to 2006. To achieve this Deutsche Bahn plans to increase the proportion of renewable energies in the DB traction electricity mix in Germany to 80% by 2030.</p> <p>From 2038, the entire Deutsche Bahn - including DB Regio and DB Cargo in addition to DB Fernverkehr - will only run on renewable electricity.</p> <p>DB Schenker committed to grow climate-neutral by 2030 and to reduce its specific GHG emissions by 40% until 2030 (Base year 2006).</p>	<p>Offer climate-friendly travel and freight transport with 100 % eco-power</p> <p>Continuously increasing the proportion of eco-power in the DB traction current mix for climate-friendly rail transport.</p>	Deutsche Bahn offers customers transporting international goods the possibility to offset GHG-emissions.
Deutsche Post DHL Group		Climate Neutrality claim: Reduce all logistics-related emissions to net zero by the year 2050.	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 6.380.000 Scope 2: 270.000 Scope 3: 22.360.000	<p>Reduce logistics-related emissions to net-zero until 2050 (this includes DHL's own fleets and those of subcontractors, warehouses and other buildings, business trips, etc.)</p> <p>Further 2050 targets include:</p> <p>Increase carbon efficiency by 50% over 2007 levels</p> <p>Operate 70% of first and last mile services with zero-emission solutions</p>	<p>Increase carbon efficiency by 50% over 2007 levels;</p> <p>Operate 70% of our own first and last mile services with zero-emission solutions;</p> <p>Certify 80% of our employees as GoGreen specialists;</p> <p>Join partners in planting one million trees every year.</p>	DHL tries to avoid simple offsetting but offers climate-neutral products using offsets to their customers. These offsets are not taken into account in DHL's own GHG reporting.
Lufthansa		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 32.790.778 Scope 2: 194.059 Scope 3: 11.089.327	<p>Increase fuel efficiency by 1.5 percent per year by 2020</p> <p>From 2020, climate-neutral growth according to CORSIA</p> <p>By 2050, decline net-CO₂ emissions by 50 percent, compared with 2005.</p>	<p>Pooling different measures implemented by different players (manufacturers, airports, air traffic control, airlines, politics).</p> <p>Four-pillar strategy for climate protection: technological progress (invest in modern and fuel-efficient aircraft and engine technologies); improved infrastructure;</p>	Growth-related CO ₂ emissions in international civil aviation are to be compensated from 2021.

Additionally, Lufthansa Group has set its own goals to reduce its specific CO₂ emissions by 25% by 2020, compared with 2006 values. operational measures, including weight reduction, flight route optimization and technical developments; economic measures; offsetting.

5.8 Sector: Other

ABB		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 361.000 Scope 2: 627.000 Scope 3: 138.000	Cut Scope 1+2 emissions by 40% by the end of 2020, from a 2013 baseline (target achieved in 2019).	Reduce GHG emissions from our use of fossil energy and transportation and from the handling of sulphur hexafluoride gas (SF6). Primary mitigation of climate change is via the development of pioneering technologies that enable utilities, industry and customers in transport and infrastructure to improve their performance and energy efficiency while reducing emissions	No use of carbon offsets.
Bertelsmann		Climate Neutrality claim: Bertelsmann intends to be climate-neutral by 2030.	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 256.500 Scope 2: 210.000 Scope 3: 1.430.400	Until 2030, Bertelsmann aims to reduce the GHG emissions generated at its locations, by its employees' mobility, and the manufacture of its own products by 50 percent compared with 2018. At that time, these emissions amounted to one million tons of CO ₂ . The remaining emissions will be offset.	Resource efficiency The Group-wide use of "green screen" IT platform to record the local energy consumption and GHG emissions of individual Group companies and regularly track the achievement of the climate-protection objectives Decreases in production outputs at the printing plants, and lower CO ₂ e factors at numerous energy suppliers, contributed to a reduction in emissions.	Use carbon offsets to achieve the climate-neutrality claim in 2030.

Deutsche Telekom		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 277.000 Scope 2: 2.077.000 Scope 3: 14.471.000	<p>Until 2020, reduce CO₂ emissions throughout the Group by 20 percent compared to 2008 (absolute figures)</p> <p>Until 2021, use of 100 percent renewable energies</p> <p>Until 2030: Reduce Scope 1 and 2 CO₂ emissions throughout the Group by 90 percent compared to 2017 (absolute figures)</p> <p>And reduce emissions from the upstream and downstream value chain by 25 percent per customer compared to 2017</p>	<p>Introduce Group-wide monitoring</p> <p>Launch new CO₂ target for new car purchases;</p> <p>Continue migration of network infrastructure to energy-efficient IP technology</p> <p>Introduce a target based on the Science-Based Targets method</p> <p>Achieve 100 percent renewable energies by 2021</p> <p>Increase the share of electricity from renewable energies; Increase the proportion of self-generated renewable energy and acquire guarantees of origin</p>	<p>The Group defined an average emission value for company cars. Emissions above the reference values are offset. Event Policy specifies that climate certificates must be purchased to compensate for CO₂ emissions generated at events in excess of 10 tons CO₂e.</p>
KPMG		Climate Neutrality claim: n/a	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 47.877 Scope 2: 144.667 Scope 3: 538.100	<p>Emission reduction target of 10% net per full-time equivalent (FTE) (employee) between 2016 and 2020.</p>	<p>Purchase electricity from renewable resources; support Climate-related Financial Disclosures.</p>	<p>No use of carbon offsets.</p>
PriceWaterhouse		Climate Neutrality claim: Aiming to be a net zero carbon emission business by 2030.	
GHG-emissions (tCO₂e)	Targets	Mitigation Measures	Offsetting
Scope 1: 467 Scope 2: 3.705 Scope 3: 47.205	<p>Work to manage the unavoidable impacts to the business and reduce carbon and GHG emissions.</p> <p>Investigate how to decarbonise our buildings and how we can convert our fleet to ultra-low emission vehicles</p>	<p>n/a</p>	<p>Since FY19, PWC invests into a range of voluntary carbon offset projects to offset travel emissions: 47,000 tCO₂e in 2019.</p>

5.9 Companies and reports surveyed

Company name	Country of Headquarter	Sector	Report name	Reporting period
ABB	Switzerland	Digital industry	Sustainability report 2018	2018
Airbus	France	Aerospace	The Sustainability of Aviation	2019
			Annual Report 2018	2018
			Registration Document	2016
Allianz	Germany	Insurance	Allianz Group Sustainability Report 2018	2018
			Allianz Group Sustainable Development: Progress Report 2012	2012
			Allianz Group Highlights Sustainability Performance 2011	2011
ArcelorMittal	Luxembourg	Steelmaking	Creating a low-carbon world The case for a Carbon Border Adjustment	2020
			Climate Action Report 1	2019
			Integrated Annual Review 2018	2018
			Fact Book	2018
Assicurazioni Generali	Italy	Insurance	Generali Group Sustainability & Social Responsibility 2018	2018
			Group Annual Integrated Report 2018	2018
			Sustainability Report 2014	2014
AXA	France	Insurance	2019 Climate Report	2019
			Registration Document 2018	2018
			Integrated Report 2018	2018
Banco Santander	Spain	Banking	Santander commits to becoming carbon neutral in 2020	2020
			2019 Annual Report	2019
BASF	Germany	Chemical	BASF Report 2019	2019
Bertelsmann	Germany	Media, services and education	GRI Report 2018	2018
BMW Group	Germany	Automotive industry	Sustainable Value Report 2019	2019
			Sustainable Value Report 2018	2018

			GRI Content Index 2018	2018
BNP Paribas	France	Banking	2018 Integrated Report	2018
Bosch Group	Germany	Multi-industry	Sustainability report 2018 factbook	2018
			Nachhaltigkeitsbericht 2018 spotlights	2018
BP	UK	Energy	BP's Advancing Low Carbon accreditation programme activity table	2019
			BP Sustainability Report 2018	2018
Carrefour	France	Food retailer	Registration Document 2018 Annual Financial Report	2018
			A year of action 2018 Activity report	2018
			Carrefour 2022 CSR and Food Transition index	2018
			Environmental Management Policy (version 2017);	2017
Continental AG	Germany	Automotive supplier industry	2018 Sustainability Report	2018
Crédit Agricole	France	Banking	2018-2019 Integrated Report	2018-2019
			Registration Document 2018	2018
			2017-2018 Integrated Report	2017-2018
			Registration Document 2017	2017
			2015-2016 Corporate Social Responsibility	2015-2016
Daimler	Germany	Automotive industry	Annual Report 2019	2019
			Sustainability Report 2018	2018
Deutsche Bahn	Germany	Transport	2018 Integrated Report	2018
Deutsche Post DHL Group	Germany	Logistics	2019 Sustainability Report	2019
Deutsche Telekom	Germany	Telecommunication	Corporate Responsibility Report 2018	2018
Electricité France	France	Energy	Reference Document 2018	2018
			EDF – 2018 Universal Registration Document (URD)	2018
Enel	Italy	Energy	Corporate Responsibility Report 2018	2018
			Long-term Sustainable Growth 2018	2018
			Sustainability Report 2018	2018
ENI	Italy	Energy	ENI For 2019 Carbon Neutrality in the Long Term	2019

			ENI for 2018 Sustainability Report	2018
			ENI for 2018 Path to Decarbonization	2018
			ENI for 2017 Path to Decarbonization	2017
Equinor	Norway	Energy	2018 Sustainability Report	2018
Exor Group	Netherlands	Investment	Exor 2018 Annual Report	2018
Glencore	Switzerland	Commodity trading and mining	Sustainability Report 2018	2018
			Databook and GRI References 2018	2018
HSBC Holdings	UK	Investment bank and financial sector	Montreal Carbon Pledge HSBC Global Asset Management	2019
			HSBC Holdings plc Environmental, Social and Governance Update	2019
			HSBC Statement on Climate Change	2016
KPMG	Switzerland	Professional services network	2019 KPMG Global Review	2019
			Nachhaltigkeitsbericht 2018	2018
Lufthansa	Germany	Aviation industry	Balance-Sustainability report 2019	2019
Munich Re Group	Germany	Insurance	Corporate Responsibility Report 2018	2018
			Munich RE Corporate Responsibility	2011
			Munich Reinsurance Company Annual Report 2009	2009
Nestlé	Switzerland	Food and beverages	Annual Review 2018	2018
			Creating Shared Value and meeting our commitments 2018 Progress Report	2018
			Annual Report 2010	2010
Peugeot	France	Automotive	Climate Report Driving Climate Leadership	2019
			2018 Corporate Social Responsibility Report	2018
			SASB Transportation Standard index	2018
Price Waterhouse	Germany	Professional services network	PwC Annual Report 2018/2019	2018-2019
			Nachhaltigkeitsbericht 2018	2018
Reckitt Benckiser	GB	Consumer goods	RB Sustainability Insights 2018	2018
	Netherlands	Energy	Sustainability Report 2018	2018

Royal Dutch Shell			Clean Energy Solutions	2019
			Sustainability Report 2016	2016
Saint Gobain	France	Manufacturing	Annual Report 2019/2020	2019-2020
			Registration Document 2018	2018
			2010 Annual Report	2010
Siemens	Germany	Energy	Sustainability Information 2019	2019
Tesco	UK	Retail	Contributing to the United Nations Sustainable Development Goals	2019
			Little Helps Plan KPIs – Data Summary	2019
			Tackling Climate Change	2019
Thyssen Krupp	Germany	Industrial engineering and steel	Annual report 2018/2019	2018-2019
Total	France	Energy	Integrating Climate into Our Strategy	2018
Unilever	GB	Consumer goods	Unilever Sustainable Living Plan: Progress in 2018	2018
			Unilever Sustainability Performance Data	2018
Uniper	Germany	Energy	Sustainability Report 2018	2018
Volkswagen	Germany	Automotive industry	Sustainability Report 2019	2019
			Volkswagen investiert in Klimaschutzprojekte zur Kompensation unvermeidbarer CO ₂ -Emissionen	2019
			Nachhaltigkeitsbericht 2018	2018

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