SUSI PARTNERS

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# GREENHOUSE GAS REPORTING ON THE PATH TO NET ZERO

## Perspective of a fund manager specialised in sustainable energy infrastructure

A SUSI Partners opinion paper

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# EXECUTIVE SUMMARY

The basis for this paper is the fundamental challenge that the global community faces in creating a net-zero greenhouse gas (GHG) emissions economy in order to prevent the grave consequences of global warming. The paper focusses on the crucial role of the financial sector and the metrics, resources and methodologies financial institutions require to take efficient climate action.

GHG reporting supports asset owners in assessing the impact of their investments on the climate and ideally functions as a catalyst to drive more capital towards a net-zero future. This paper provides our perspective as a fund manager specialised in sustainable energy infrastructure investments on the currently available reporting methodologies and is intended to make a contribution towards the development of a widely accepted, objective and comparable GHG reporting standard.

We reach the following key conclusions:

- Working towards GHG reporting that not only covers direct emissions but includes indirect emissions along the entire value chain can reduce the risk of emissions being merely exported
- The entity which exerts operational or financial control over an investment has the power to implement emissions reduction measures and should therefore be attributed 100% of the emissions
- Reporting of avoided emissions is well suited to support the reallocation of capital towards a clean energy system, as it can account for regional differences in grid emission factors and is flexible in adapting to technological developments
- Attribution of avoided emissions should follow the same logic as the reporting of direct and indirect emissions. This means that the controlling entity, as the party enabling the investment, is also the one credited with the avoided emissions

We are committed to continously build upon our own internal methodologies of GHG reporting to ensure alignment with evolving industry standards and look forward to engaging in discussions on the topic with other market participants and stakeholders.

# 1 INTRODUCTION

The International Panel on Climate Change's (IPCC) latest report, issued in August 2021, outlines clearly that the race to a future with net-zero GHG emissions needs to significantly accelerate for the global community to maintain a chance of limiting global warming to well below 2.0°C in accordance with the 2015 Paris Agreement. Institutional capital plays a key role in driving the decarbonisation of the economy. Given that energy use accounts for approximately 73% of global GHG emissions (Ritchie, 2020), directing private capital towards investments that support the transition of the energy sector towards a decarbonised, decentralised, flexible, and consumer-oriented future will be a decisive factor in determining which global warming trajectory we will follow from here on out.

As a fund manager focussed on sustainable energy infrastructure investments since inception, this has always been our message. That message is becoming more prevalent and more urgent every year. To reach net zero by 2050, investments in a clean energy system of USD 4.4 trillion annually are required (IRENA, 2021). Alarmingly, less than half of this is being allocated today, leaving a substantial financing gap that urgently needs to be closed.

In order to fill this gap, investors first need to find ways to assess the climate impact of their investments. GHG reporting methodologies try to offer a solution by defining GHG emissions attribution criteria, thus providing accountability and allowing organisations to track the impact of actions taken against objective targets. For such a methodology to be effective, it needs to be widely adopted in order to produce consistently derived and hence comparable data sets across sectors.

Following this introduction, Chapter 2 will provide an overview of the challenge that the decarbonisation of our economy presents by discussing the global carbon budget, a feasible path to net zero, initiatives to accelerate the process, and the crucial role of the financial sector in providing the capital necessary to realise this transition of the economy. Chapter 3 discusses relevant concepts from the GHG Protocol and the Partnership for Carbon Accounting Financials (PCAF), and underlines the importance of a consistently applied GHG reporting methodology to allow financial institutions to properly assess the impact of their investments. Finally, Chapter 4 discusses the benefits of reporting avoided emissions and the role it plays in reallocating capital towards investments that mitigate global warming.

SUSI Partners intends to use the insights gained in the process of authoring this paper to continue to develop more comprehensive GHG reporting and are hopeful that it will help other financial institutions facing similar challenges do the same. We look forward to engaging with the broader investment community on the topics touched upon herein, in the interest of better aligned and ultimately more effective climate action.

# 2 THE URGENCY OF CLIMATE ACTION

Recent reports on the gravity and speed of global warming have made it even more clear that immediate and radical action is required to mitigate the adverse effects of climate change. A path to net-zero GHG emissions is feasible from a technological perspective, but the financial sector will need to act much more decisively in financing this transition of the economy, and especially the energy sector as the largest contributor to global GHG emissions. A failure to do so will lead to greater costs from future damages, such as more frequent natural and social disasters as well as economic failures including breakdowns of supply chains.

This chapter takes a look at the concept of a global carbon budget, presents a technologically feasible path towards net zero, discusses both public-sector as well as private-sector initiatives, and concludes by zeroing in on the crucial role assigned to the financial sector in driving the transition of the economy.

## 2.1 GLOBAL CARBON BUDGET

Stabilising the global average temperature at any level will require achieving net-zero anthropogenic, i.e. human-caused, GHG emissions. As the IPCC report shows, an increase of 1.1°C compared to pre-industrial times has already been reached and an increase to 1.5°C by 2050 is virtually certain (IPCC, 2021). At which level global average temperatures plateau will largely depend on how much carbon dioxide ($CO_2$) is emitted until net zero is achieved. Given the binding commitments made in the 2015 Paris Agreement, namely limiting the rise of global average temperature to well below 2.0°C compared to pre-industrial times, scientists have calculated how much $CO_2$ can still be added to the atmosphere within the goals of the Paris Agreement – the so-called "carbon budget" for the planet.

Table 1 assigns probabilities to a given carbon budget's chances of limiting global warming to either 1.5 or 2.0°C. The more GHG are emitted until net zero is reached, the lower the probability of achieving the respective targets. As Figure 1 shows, if remaining emissions are kept below or equal to 400Gt $CO_2$ starting from 2020, there is an estimated 67% chance of limiting global warming to 1.5°C. The same probability is assigned to limiting average temperature rise to below 2.0°C, if no more than 1,150Gt $CO_2$ are emitted (IPCC, 2021).

| APPROX. GLOBAL WARMING RELATIVE TO 1850-1900 UNTIL TEMP. LIMIT *(°C)**(1) | ADD. GLOBAL WARMING RELATIVE TO 2010-2019 UNTIL TEMP. LIMIT *(°C)* | ESTIMATED REMAINING CARBON BUDGETS FROM THE BEGINNING OF 2020 (Gt $CO_2$) LIKELIHOOD OF LIMITING GLOBAL WARMING TO TEMPERATURE LIMIT*(2) | | | |
|---|---|---|---|---|---|
| | | 33% | 50% | 67% | 83% |
| 1.5 | 0.43 | 650 | 500 | 400 | 300 |
| 1.7 | 0.63 | 1,050 | 850 | 700 | 550 |
| 2.0 | 0.93 | 1,700 | 1,350 | 1,150 | 900 |

Table 1 - Estimated remaining carbon budgets for different temperature limits (IPCC, 2021)

To put these figures into perspective, anthropogenic $CO_2$ emissions in 2019 reached approximately 37Gt (Global Carbon Project, 2021)*, which means that if we collectively continue at this rate, we will have used up our carbon budget for the 1.5°C goal in less than ten years, and around 2050 for the 2.0°C target. Given that even in the most optimistic scenarios outlined by the IPCC, carbon emissions are not expected to drop before 2025, reaching even the 2.0°C will be a monumental challenge and will require drastic measures, not least from the global investor community.

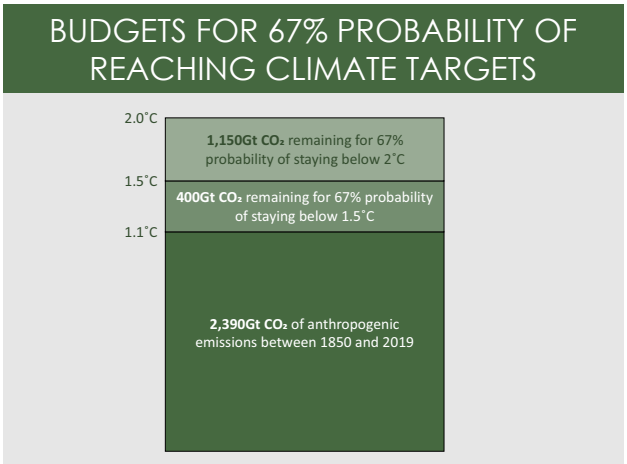
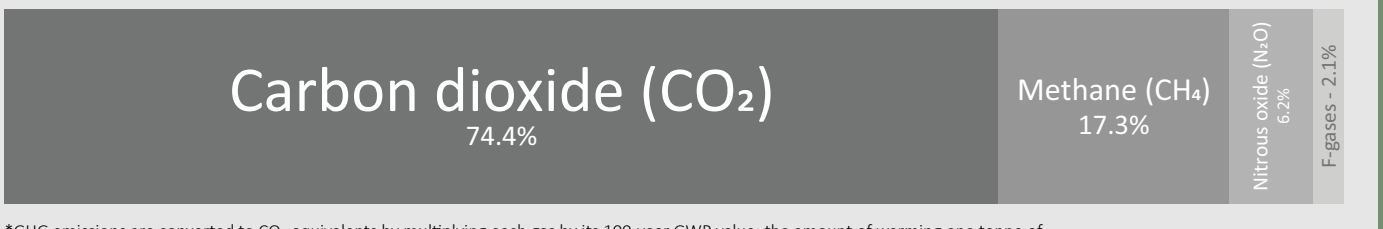



Figure 1 - Carbon budgets for 67% probability of reaching 1.5/2.0°C (IPCC, 2021)

## GREENHOUSE GASES

Greenhouse gases are gases which cause the greenhouse effect, i.e. global warming, through an accumulation of gases in the atmosphere which prevent heat generated by the planet and human activities from being released in a balanced manner. The most prominent greenhouse gas is carbon dioxide, or $CO_2$. Next to $CO_2$, the main contributors to anthropogenic global warming are methane, nitrous oxide, halogenated gases, and carbon monoxide emissions.

In fact, many greenhouse gases have a much stronger warming potential per kg than $CO_2$, with the duration for which they remain in the atmosphere varying widely. However, since $CO_2$ occurs in much higher quantities, it accounts for roughly 74% of anthropogenic global warming. For reporting purposes, $CO_2$ is therefore often used as the reference gas whereby other gases are converted and expressed in $CO_2$ equivalents according to their global warming potential (GWP), usually over a hundred years. The resulting impact breakdown is shown in Figure 2.




*GHG emissions are converted to $CO_2$-equivalents by multiplying each gas by its 100-year GWP value: the amount of warming one tonne of the gas would create relative to one tonne of $CO_2$ over a 100-year timescale. This breakdown is shown for 2016.

Figure 2 - Global greenhouse gas emissions by gas (Ritchie, 2020)

* The 37Gt only account for $CO_2$ and do not include any other greenhouse gases, for which separate budgets can be calculated.

## 2.2 THE PATH TO NET ZERO

Transforming the way energy is produced, distributed and used is at the core of reaching net zero. The International Energy Agency's (IEA) "Net Zero by 2050" report provides a viable roadmap towards an energy system in which anthropogenic GHG emissions and the removals thereof are in balance (see Figure 3). Many of the technologies required for clean power generation, such as solar photovoltaic systems and wind turbines, are already deployed at scale, but deployment will still need to significantly accelerate for the Paris Agreement targets to remain feasible. Much more focus needs to be put on energy efficiency gains, making up for more than 40% of the total need for investment in the International Renewable Energy Agency's (IRENA) "Pathway to 1.5°C" scenario, as well as enabling technologies such as energy storage, upgrading electrical grids, and electrifying or otherwise decarbonising industry, transportation, and hard-to-abate sectors. As new technologies continue to be developed and reach economic breakeven points, remaining technology-agnostic in devising decarbonisation strategies is important to pursue the most cost-efficient path towards net zero.

As the IEA's roadmap shows, carbon capture will also be indispensable to reach net zero by 2050. However, the best solution is leaving fossil fuels untouched in the first place, thereby leaving the carbon stored in the ground in the form of coal, oil, or natural gas. As explained further in Box 2, storage for GHG removed from the atmosphere is limited and needs to be reserved for those residual emissions that cannot be avoided. Accordingly, a concerted effort to avoid emissions in the first place will be imperative, and much will depend on the commitment of the global investor community to reach those targets.

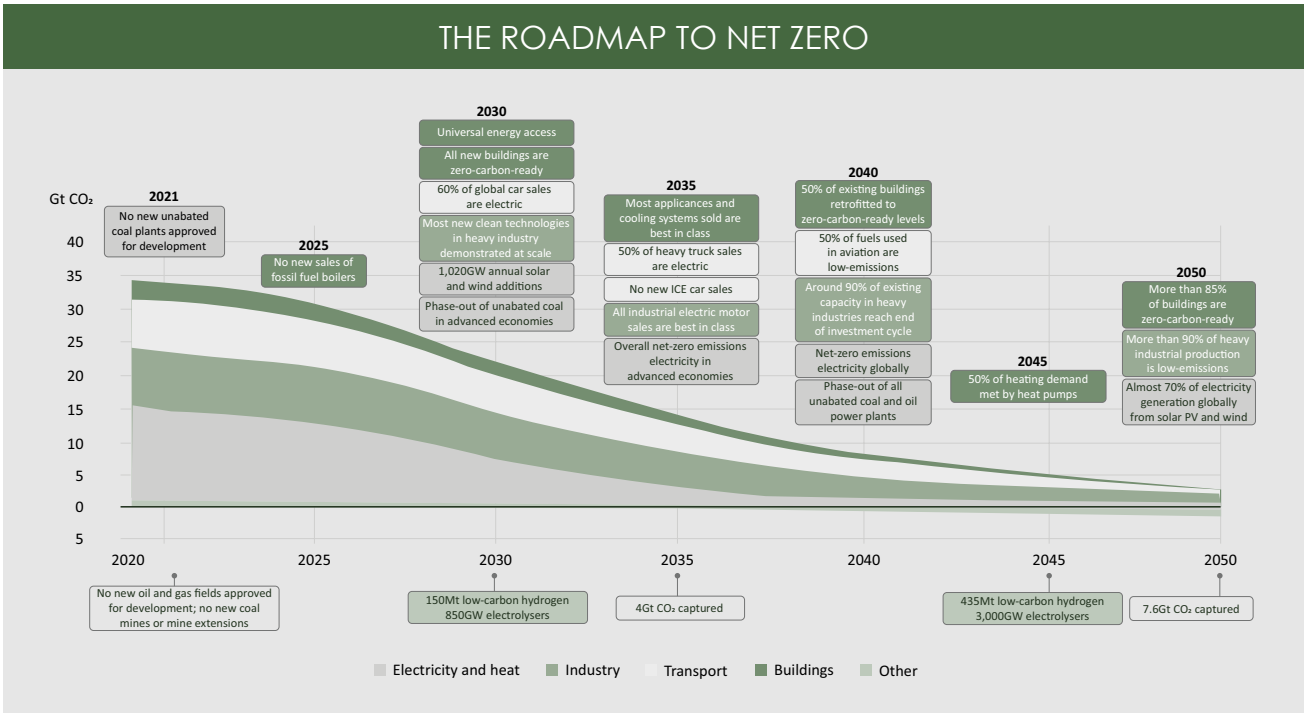



Figure 3 - Key targets to be met on the path to net-zero anthropogenic GHG emissions (IEA, 2021)

## THE "NET" IN NET ZERO

"Net zero" implies that the goal is to strike a balance between remaining GHG emissions and the active removal of such gases out of the atmosphere and into carbon sinks (e.g. through forestation or carbon capture technologies). To be viable, such carbon sinks need to be maintained permanently, or at least for the same duration that released $CO_2$ stays in the atmosphere.

However, the amount of natural carbon sinks is limited and needs to be reserved for those activities which are hard to abate. Accordingly, the majority of industries will need to achieve zero emissions with "net" zero only being reserved for the few industries that have limited mitigation options at their disposal. It follows that in a first step, immediate efforts to reduce and avoid emissions are required to limit the quantity of emissions that need to be offset in the future. Subsequently, investments into removing emissions through low-risk, long-term carbon storage options should follow to neutralise harder to abate emissions. Both sides of the equation are crucial to making net-zero GHG emissions a reality. This hierarchy is clearly reflected in the IPCC pathways which first focus on reducing fossil fuel emissions before expanding activities around $CO_2$ removals. The definitions on the right clarify the two-step hierarchy in more detail.

### REDUCING & AVOIDING EMISSIONS

- **Reduced emissions** refer to changes in consumption and production that lower the emissions intensity of companies or projects. Examples are limiting business travel or enhancing energy efficiency of industrial processes
- **Avoided emissions** are estimates of prevented emissions beyond a project or company's value chain. They are determined by comparing the implemented measure's emissions to a baseline scenario, i.e., if no action was taken. A prominent example of avoiding emissions is the displacement of fossil-fuel-based power generation by renewable energy

### REMOVING EMISSIONS

- **Removing emissions** includes activities that remove GHG from the atmosphere. Examples are the planting of trees or using technologies of direct air carbon capture and storage. The time frame of storage and risk of reversal needs to be considered when accounting for removed emissions

## 2.3 DECARBONISATION INITIATIVES

The 2015 Paris Agreement is regarded as the overarching climate-related pledge currently in effect, with 197 nations as signatories committing to limit global warming to well below 2.0°C. While signatories are obliged to regularly set national GHG reduction targets, the Agreement does not entail any legally binding reduction targets. Signatories hence do not have to fear any significant ramifications for not meeting the targets defined in their Nationally Determined Contributions (NDC).

Nevertheless, an increasing number of countries are implementing legally binding reduction schemes on a national or supranational level, which are explored further in Section 2.3.1. In addition to these regulatory schemes, recent years have seen a surge of companies issuing their own pledges, often as part of a larger initiative such as the United Nations Framework Convention on Climate Change's (UNFCCC) Race to Zero, which are discussed in Section 2.3.2. Finally, the 2021 UN Climate Change Conference (COP26) in Glasgow is expected to produce a wider push for binding commitments to reduce GHG emissions from both sovereign and private entities.

### 2.3.1 GOVERNMENT-DRIVEN SCHEMES

Carbon reduction schemes initiated by governments and regulators include carbon taxes, cap-and-trade schemes or the subsidising of clean technologies. These schemes aim to promote emission reductions and stimulate development of low-carbon industries.

According to the World Bank, 64 jurisdictions, accounting for an estimated 21.5% of global GHG emissions, currently have carbon pricing schemes in place, by way of a carbon tax or through a form of emissions trading system (ETS). Both approaches aim to pass on the external costs associated with emitting GHG, previously carried by the general population, to those responsible for the emissions. While a carbon tax sets a price on emitting carbon (and benefits the respective state's tax base), an ETS – often referred to as a cap-and-trade system – caps the total level of GHG emissions. This allows those industry players with spare emission credits to sell them to larger emitters, with the state being a mere organiser and regulator of such schemes which operate between emitting entities. Determining the price of carbon or the respective GHG emissions cap is subject to political considerations, with nations presenting various outcomes.

In 2021, carbon prices range from around 137 USD/$tCO_2e$ in Sweden to 25 USD/$tCO_2e$ in the United Kingdom, with much of the success depending on the design and implementation of the scheme. However, ETS and carbon tax schemes usually only focus on direct emissions and might therefore incentivise industries to export their emissions-intensive operations to non-regulated jurisdictions.

Subsidies helped accelerate the deployment of renewable energy technologies such as wind and solar photovoltaics, allowing those technologies to develop the scale required to be cost competitive. They can be used to similarly increase the adoption of low-carbon technologies that are in earlier stages of maturity today, e.g. energy storage or the production of green hydrogen. However, they often lack flexibility and may be subject to lobbying efforts, as the substantial amounts of subsidies for fossil fuels show (according to the IMF, fossil fuel subsidies reached USD 5.9 trillion or 6.8% of global GDP in 2020*). Often, subsidies have a tendency to become a burden on consumers or state financials before reaching the desired scaling effects, leading to premature re-regulation and the associated uncertainty for private investors. While they have their own shortcomings, carbon pricing and ETS schemes are therefore better suited to efficiently decarbonise an economy.

## 2.3.2 VOLUNTARY INITIATIVES

Voluntary initiatives such as the UNFCCC's Race to Zero can help compensate for some of the shortcomings of regulatory schemes. For example, the Race to Zero initiative aims to mobilise actors outside of national governments – i.e. businesses, cities, regional governments, investors, etc. – with the goal of achieving net-zero anthropogenic GHG emissions. While regulatory schemes generally only cover direct emissions, such voluntary initiatives, coupled with a consistently applied measuring and reporting methodology, can integrate indirect emissions linked to an entity's activities as well.

Using the word *race* already has the potential to be misconstrued as a competition between organisations, particularly businesses, to determine the fastest actor to drive only the emissions attributable to its own activities towards net zero. Clearly, this is not the intended meaning, as stated explicitly by UN representatives for climate action Nigel Topping and Gonzalo Munoz: "unlike most races, the race to zero emissions won't have one winner. In this race we all win, or we all lose." Including indirect emissions in the reporting methodology avoids the incentive to merely export emissions and thus reflects that the race to zero is not a competition between organisations, particularly businesses, but a race against time that requires full cooperation between companies, governments and other organisations.

Voluntary initiatives usually require participants to commit to a certain emission reduction target within a defined time period. Following through on such pledges requires companies to be fully aware of what these commitments entail. In the case of the Race to Zero initiative, a pledge must be followed by an action plan. Given that in the past, organisations often committed to long-term targets, such as achieving net zero by 2050, without taking measures in the short term, the UNFCCC's recent emphasis has been on requiring companies to commit to a 50% emissions reduction by 2030 and to present a 5-year action plan within a year of the net-zero pledge. To ensure that actions are implemented and to track their efficacy, companies are then required to report annually on their progress.

A crucial prerequisite for consistent and comparable tracking of companies' progress is a shared and consistently applied methodology to credibly attribute emissions to individual entities. However, this has not yet been established and the underlying data availability is often insufficient, forcing companies to rely on estimates that may not be tailored to a specific business model.

Ultimately, overcoming the shortcomings of both regulation and voluntary initiatives requires collaboration between government bodies and private-sector initiatives to ensure wide applicability of frameworks to actual market conditions. This would also allow for standardisation and enforcement beyond national borders, an essential prerequisite for international organisations and investors.

### CLARIFICATION OF PREVALENT TERMS

An increasing number of companies, particularly in less GHG-intensive sectors, are declaring to have reached certain targets already, using a variety of terms such as "carbon neutral" or "climate neutral". Usually this is only possible through the practise of offsetting GHG emissions, i.e. the compensation of emissions caused with contributions towards projects that either avoid emissions or remove GHG from the atmosphere to be stored in suitable carbon sinks.

In the interest of developing a common understanding of the key terms used in such claims, Oxford Net Zero provides the definitions explained in the following. There are three questions to ask when differentiating between the various terms delineating some form of neutrality with regards to an entity's GHG footprint:

1. Are there any emissions attributable to the organisation that need to be offset? If the answer is no, the term "**zero emissions**" or "**absolute zero**" is applicable. However, in today's economy, it is extremely unlikely that a company can avoid all direct and indirect emissions along the entire value chain.

* 8 percent of the 2020 subsidies (approx. USD 472bn) reflect undercharging for supply costs (explicit subsidies) while 92% account for undercharging environmental costs and foregone consumption taxes (implicit subsidies).

## 2.4 THE ROLE OF THE FINANCIAL SECTOR

Financial markets have the power to accelerate the energy transition by investing in sectors that are viable and profitable in the long term, and by divesting from sectors that are expected to be in decline. The redirection from a fossil towards a sustainable economy is materialising with the S&P Clean Energy Index registering an increase of 138% in 2020, while the fossil fuel-heavy S&P Energy Index sustained a 37% loss in the same time period. However, the shift is not happening fast enough to meet the climate targets set forth in the Paris Agreement (IRENA, 2021).

According to IRENA's 2021 World Energy Transitions Outlook, annual investments into clean energy need to increase from USD 1.8 trillion in 2019 to USD 4.4 trillion on average until 2050. As Figure 4 shows, the largest share of the total USD 131 trillion is required for energy efficiency measures, followed by clean power generation as well as storage, distribution and electrification.

Financial institutions play a key role in closing this investment gap. On the one hand, investors should invest to decarbonise the operations of their underlying portfolios. On the other hand, they need to form investment strategies which reallocate capital towards sectors that are aligned with a sustainable composition of energy systems. Safeguarding investments means divesting from assets which do not meet net-zero criteria or investing to bring them in line, and at the same time redirecting capital towards a clean energy system and other decarbonisation efforts.

2 Which climate-relevant factors are considered? The term "**carbon neutral**" or "**carbon negative**" only requires the measuring and offsetting of $CO_2$. "**GHG neutral**" expands the scope to include all relevant GHG, and "**climate neutral**" factors in not only gases but all climate-relevant factors including land-use changes.

3 Are emissions offset "**like-for-like**", meaning are $CO_2$ emissions offset by $CO_2$ removals, methane emissions by methane removals, etc.? To meet this criterion, emissions and offsets cannot simply be expressed in $CO_2$ equivalents, but separate accounts for each GHG need to be kept. Furthermore, like-for-like offsets also need to match emissions caused in terms of permanence and the biodiversity affected. What constitutes a credible offset project is a subject of continuous debate.

Further often used terms are "**Paris Agreement-aligned**", "**Science-based-aligned**", or "**1.5°C-aligned**". These terms take the latest consensus on climate science as their basis and assign carbon budgets, with low probability of overshooting, that are aligned with the respective targets declared in the Paris Agreement.

Generally, entities must include not only emissions for which they are directly responsible, but also emissions that are associated with the generation of the energy they consume, as well as emissions occurring along the entire value chain of the company (discussed in more detail in Chapter 3). Only by doing this can companies truly claim that their activities result in no net warming effect.

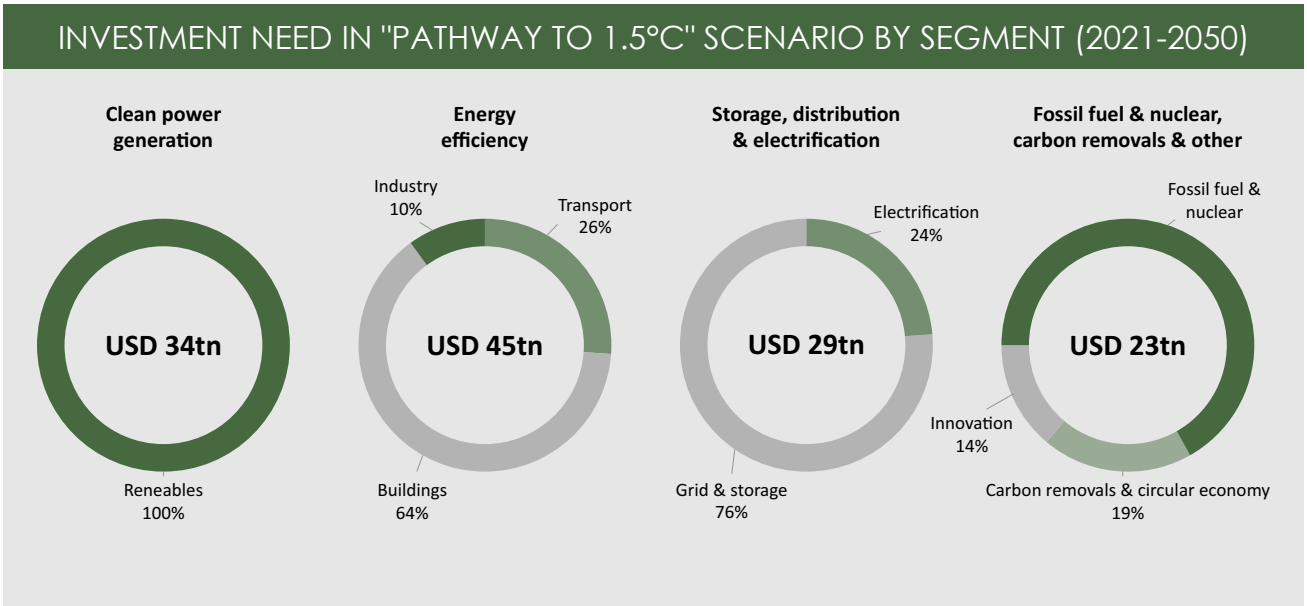



Figure 4 - Investment need in Pathway to 1.5°C scenario by segment (IRENA, 2021)

# 3 GHG REPORTING METHODOLOGY

Asset managers and owners should have a good understanding of the various concepts being developed around GHG reporting to enable informed decision making and ensure the development of reliable and fully transparent reporting. There is still a lot of progress to be made in terms of measuring and attributing emissions. Part of the challenge is the collection of GHG emissions data across entire value chains; and even if the underlying data is available, reporting methodologies need to be standardised and applied consistently across sectors to ensure uniformity and comparability.

After introducing the different emission scopes in general in accordance with the GHG Protocol, this chapter will then consider how these and other GHG reporting principles should be applied in the financial sector according to the PCAF methodology and move into a more specific discussion of project finance as a relevant case for infrastructure investors.

## 3.1 EMISSION SCOPES

According to the GHG Protocol, companies should report their emissions across three scopes to help distinguish between direct and indirect emissions, as further illustrated in Figure 5.

**Scope 1 - Direct GHG emissions:** These emission sources are owned or controlled by the reporting entity and can be split into four categories: stationary combustion (e.g. fuels, heating sources), mobile combustion (e.g. company-owned or controlled vehicles), fugitive emissions (refrigeration, air conditioning) and process emissions (from industrial processes e.g. cement production, factory fumes, chemical reactions).

**Scope 2 - Indirect GHG emissions:** Indirect emissions from the generation of energy in all its forms (electricity, steam, heating, cooling, etc.) purchased by the reporting entity.

**Scope 3 - Indirect GHG emissions:** All further indirect emissions not covered by scope 2 that occur along the value chain, both up- and downstream of a company. Upstream Scope 3 emissions originate from activities such as purchased goods and services, business travel, or employee commuting, while downstream emissions arise from activities such as transportation, distribution, or use of sold products.

The sum of all scope 1 emissions in the world hypothetically corresponds to the total of global emissions if there were no misallocations (through underreporting or double counting). Taking into account scope 2 and 3 emissions therefore inherently represents a form of double counting. For example, the emissions occurring during the electricity production of a coal plant are counted as the scope 1 emissions of the coal

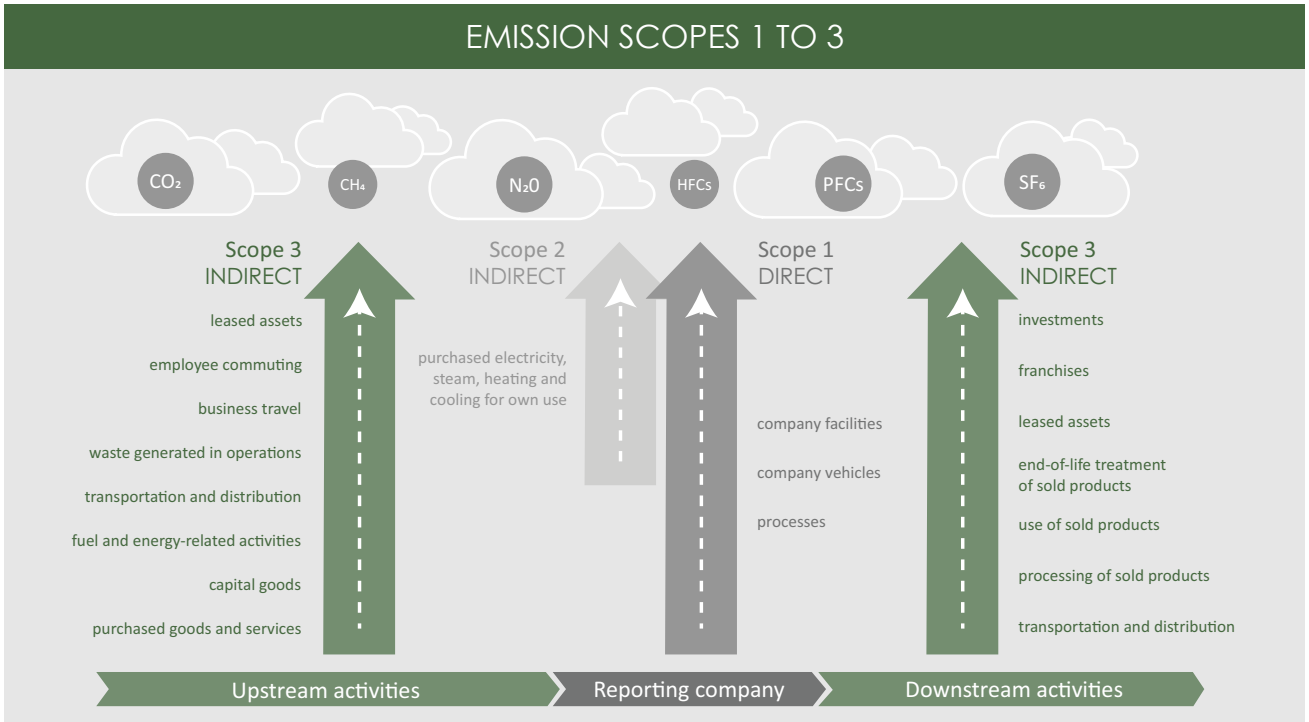



Figure 5 - Emission scopes 1 to 3 illustrated (MyClimate, 2021)

plant owner but also as the scope 2 emissions of the purchaser of the electricity. That is why emission scopes need to be reported separately.

There are good reasons for asking companies to cover scope 2 and 3 emissions in their reporting. The practise accounts for the fact that the race to zero is not a competitive race between individual entities. On the contrary, only if GHG emissions are reduced globally and in every sector of the economy can the race be won. Reporting scope 2 and 3 emissions provides an incentive structure for companies to not only focus on their own direct emissions but to indirectly compel others to act as well, and hence change entire industries through concerted action.

As pointed out previously, this is also where regulatory regimes like ETS and carbon taxes are limited, as they are focussed exclusively on direct scope 1 emissions. Direct-emissions-only schemes could potentially incentivise both countries as well as companies to outsource emissions-intensive activities, which might lead to mere shifts of emissions rather than actual emission reductions. Regulators currently face a difficult task in including indirect emissions into their carbon pricing schemes. Initiatives such as the Race to Zero therefore aim to fill this gap but have to ultimately rely on the best-effort cooperation of its signatories in reporting and reducing their indirect emissions.

## 3.2 GHG REPORTING FOR INFRASTRUCTURE INVESTORS

While the GHG Protocol provides general guidelines on how to report emissions, sector-specific standards are required to ensure consistency within an industry. For the financial industry, the PCAF standard provides useful instructions, particularly on how financed emissions can be accounted for. Financed emissions refer to emissions of companies or projects to which a reporting entity provides capital. They fall under the capital providers' scope 3 emissions. The PCAF reporting standard is still evolving and there is no regulator behind it with the power to enforce it. However, it has been endorsed by initiatives such as the Paris Aligned Investment Initiative, Carbon Disclosure Project (CDP), Science Based Targets initiative (SBTi) and the UN-convened Net-Zero Asset Owner Alliance.

While the PCAF provides guidance on several asset classes such as listed equity, corporate bonds, business loans and commercial real estate, the most relevant asset classes for private fund managers focussed on clean energy infrastructure, are project finance and unlisted equity. According to PCAF, these asset classes include the provision of equities and loans to projects and companies which rely primarily on an investment's cash flow for repayment of, and return on capital.

The PCAF generally advocates applying a so-called "control approach" for keeping GHG emission inventories. There are two scenarios for asset managers to consider under the control approach:

1. If there is no clear controlling entity, the emissions of the underlying investment are attributed to the individual capital providers, of both equity and debt, according to their respective exposure in the venture usually at year-end.

2. If an entity has de-facto financial or operational control over an investment (a project SPV or operating portfolio company), it is required to assume 100% of the investment's emissions. In this case, minority shareholders or creditors are not attributed any emissions, as this would constitute double counting. The approach reflects the fact that it is the entity exercising control that has the power, and hence the responsibility, to implement measures to reduce emissions.

Building on the PCAF methodology, the Science Based Targets initiative (SBTi) recommends that for private market investments, all allocated emissions, regardless of whether they arise from a controlling or a non-controlling interest, should be accounted for in scope 3, financed emissions. However, the PCAF, in their non-asset-class-specific section, advocates reporting emissions from a controlling interest as if they were the financial institution's own emissions across scope 1, 2 and 3. Ultimately, the SBTi's private equity-specific approach, which is being developed in a process for which SUSI Partners is a contributor, overrules PCAF's more general approach for two reasons. First, it accounts for the fact that target setting frameworks such as the SBTi's portfolio coverage method are specifically designed to reduce scope 3 emissions. Secondly, it prevents large fluctuations in scopes 1 and 2 of asset owners from acquisitions and sales of investments.

Attribution of emissions requires following the money along the ownership structure as far as possible. A private fund's emissions are attributed to the fund's investors according to their respective shares. As it would be rather unusual for a single investor to acquire a controlling interest in a fund, all emissions on the fund level will be aggregated, multiplied with the investors' respective share, and ultimately reported as scope 3 emissions of the individual investors.

The outlined reporting methodology has the potential to bring more transparency to the market and enable asset owners to include climate impact considerations in their investment decisions. However, without sector-wide adoption of one specific reporting practise and a supervising body to enforce it, the attribution of GHG emissions bears potential for conflict between the parties involved in a project.

Resolving these issues requires collaboration between regulatory bodies and sector initiatives to ensure wide

applicability of frameworks to actual market conditions. This would also allow for standardisation and enforcement beyond national borders, which is an essential prerequisite for organisations and international investors to ensure emissions are attributed correctly. For financial institutions, being part of the discussion and exchanging ideas with market participants and other stakeholders is beneficial and even necessary to establish common standards.

### REPORTING TIMELINE & LIFETIME EMISSIONS

Investment emissions will generally be calculated and reported annually, which means that a specific period will be agreed on (usually the calendar year) to serve as the basis for the attribution process. However, depending on the type of investment, emissions may be very unevenly distributed across its lifetime. For example, a natural gas-fuelled power generation plant registers significant emissions during the operational phase whereas emissions occurring during construction and disposal are almost negligible in comparison. A wind farm, on the other hand, incurs most of its associated lifetime emissions – while of course still much lower than for the gas plant – during the construction phase, as operational emissions are minor. It follows that if an investor acquires a project before or during the construction phase, emissions will be reported accordingly throughout the construction phase as financed emissions. However, if a project is acquired after construction has been completed, the bulk of emissions of a wind farm would already have been reported by the project developer during construction of the asset. To account for this, the PCAF recommends that financial institutions calculate lifetime emissions of an investment where possible and report them separately in the year of contracting.

# 4 AVOIDED EMISSIONS

In the case of clean energy investments, the PCAF introduces the reporting of an additional scope of emissions – avoided emissions. They inform asset owners about the potential reduction in emissions achieved compared to what would have been emitted in the absence of the project (baseline emissions), based on the current energy mix in a specific region and the respective investments' business model and market position.

The calculation and attribution of avoided emissions will be the focus of this last chapter, followed by a discussion of why avoided emissions should be viewed as an important element of broader impact reporting.

## 4.1 CALCULATING AVOIDED EMISSIONS

As pointed out, investors should, where possible, report the total projected lifetime scope 1, 2 and 3 emissions of an acquired investment within the year of acquisition. Based on the respective investment's expected lifetime, one can derive the annualised lifetime GHG emission factor, which is the calculated lifetime emissions of the project divided by the projected lifetime. Once the annualised lifetime GHG emission factor is derived, it is subtracted from the current country- or region-specific grid emission factor (see Figure 6).

These grid emission factors usually do not account for emissions caused throughout the lifetime of the underlying assets, which would include construction and decommissioning emissions. Since the calculation method does include such construction and decommissioning emissions in the lifetime emissions of the clean energy asset that is compared to these grid emission factors, the resulting avoided emissions are likely to be underestimated.

### QUANTIFYING AVOIDED GHG EMISSIONS FROM PROJECTS

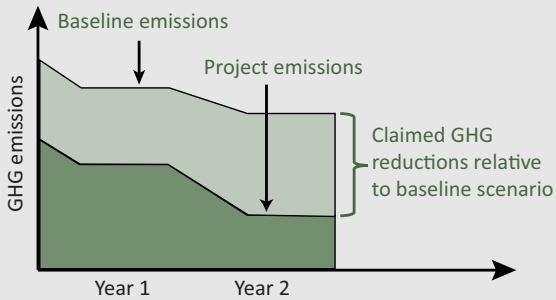



Figure 6 - Quantifying avoided GHG emissions from projects (GHG Protocol, 2003)

For avoided emissions calculations, the geographical and market context is extremely important as the avoided emissions in a country with a highly polluting energy mix will be more substantial than in a country which has already transitioned towards a low-carbon energy mix.

The underlying baseline emission factors are highly dependent on the quality and verification process of the respective utilities' GHG reporting and, where applicable, the aggregation to a national emission factor. Emission factors can also vary throughout the day depending on the energy output. Ideally, emission factors would be calculated and reported on a continuous basis rather than considering periodical totals and averages, but such data granularity is near impossible to achieve. Finally, the calculation of lifetime emission factors needs to account for projected changes in the underlying energy mix over the term, specifically in the context of an ongoing energy transition, in which emissions, and hence avoided emissions, will hopefully continuously decrease from year to year i.e. depicting a decreasing marginal emissions impact. While the data quality in this respect is expected to improve in the future, there is still a level of caution required when calculating avoided emissions today. Accordingly, a conservative approach to reporting avoided emissions, and hence a tendency for underestimation rather than overestimation, is better suited to build trust and credibility in the reported data.

## 4.2 ATTRIBUTING AVOIDED EMISSIONS

The reporting of avoided emissions follows the logic of the emission attribution process described in Chapter 3.2. While financial institutions are not necessarily incentivised to claim caused emissions for themselves, avoided emissions can be a valuable means to appeal to impact-focussed investors and other stakeholders. The incentives for double counting are accordingly high, and undesirable outcomes of double counting avoided emissions likely.

To ensure consistency across scopes, the attribution methodology outlined for emissions should be applied for avoided emissions as well. Accordingly, entities holding a controlling interest should claim 100% of the avoided emissions of an underlying investment, while creditors and minority shareholders should not claim any. If there is no controlling party, the avoided emissions are attributed to shareholders and creditors according to their pro-rata financial exposure to the investment.

As explained in Chapter 3.2, the justification for applying such a control approach on the emissions side is that the controlling entity has the most power to implement measures to reduce operational emissions of an investment. In turn, the controlling entity, as the party enabling the project, is also the one credited with the avoided emissions. As mentioned, attribution of emissions requires following the money. In the case of a private fund, the General Partner exercises control on behalf of the Limited Partners (LP) in the fund, and the avoided emissions are attributed to LPs according to their respective share in the fund.

However, ensuring that other financiers or stakeholders involved in a project (such as construction companies, original equipment manufacturers etc.) subscribe to the same methodology is difficult. It is therefore possible that a minority shareholder or debt provider claims avoided emissions as well. It may even be the case that a customer (e.g. a power offtaker) claims avoided emissions in connection with a renewable energy project. However, in this case, the GHG Protocol's reporting method outlined in Chapter 3.1 would clearly prevent this, as the offtaker would only see its scope 2 emissions reduced, while the financiers of the project can report the avoided emissions in the dedicated scope. These issues again underline the importance of the entire asset management industry, including the investors it serves, consolidating around one approach.

### OFFSETS & AVOIDED EMISSIONS

Offsetting projects either actively remove GHG from the atmosphere or they avoid GHG emissions. Their validity is based on a key criterion, namely if a project is additional, meaning that it would not have been implemented in the absence of a market for offset credits. In other words: the share of project revenue originating from selling carbon offsets is substantial enough for the project to be unprofitable without it (Offsetguide, 2021).

Generally, avoided emissions from clean energy projects should not be used to offset emissions caused elsewhere, as they are reported in a category separate from the absolute emissions registered in scope 1 to 3. The separation of absolute emissions and avoided emissions in reporting is also crucial to account for the fact that while clean energy projects may help avoid emissions in the relevant energy mix, they still cause emissions in absolute terms, albeit at a comparatively low level.

Today, clean energy projects usually deliver appropriate returns on investment without relying on selling offset credits given that the underlying technologies are economically competitive in today's market and these projects can therefore not be considered additional. It follows that investors cannot use the emission savings associated with their investment in such projects to offset emissions from e.g. oil or gas-based investments in their portfolio. Emissions caused can only be compensated through purchase of qualified offset credits.

In the context of working towards a net-zero target, companies should only offset residual emissions after all avenues to reduce GHG emissions along the entire value chain have been explored. Contributing to high-quality offsetting projects can certainly be a plus, but it should not be prioritised over and therefore delay the decarbonisation of a company's own operations or an investment portfolio.

## 4.3 DIRECTING CAPITAL TOWARDS CLIMATE CHANGE MITIGATION

Reporting of avoided emissions can be a valuable tool for investors to assess the climate impact of their investments. However, the calculation of avoided emissions is still inconsistent across the market and specific business models often require the development of a proprietary methodology to do so accurately. Full transparency is required to ensure that the reported information is complete, consistent with market standards, and ultimately credible.

There are other approaches to support the direction of capital towards sustainable investments, which usually classify technologies as sustainable and then encourage asset owners to increase their exposure in these technologies. Similarly, governments can define capacity deployment targets for pre-defined technologies. In comparison, reporting avoided emissions is more flexible in adapting to technological developments, as it is not constrained by such classifications. Furthermore, it can account for the significant regional differences in the grid emission factors that build the base for the calculation of avoided emissions and allow asset owners to compare the impact of a technology across the globe. To illustrate: investments in clean energy projects in emerging markets where the decarbonisation of the energy system is usually less advanced will result in higher avoided emissions than in developed markets where the integration of renewable energies has progressed further. As pointed out before, avoided emissions will hopefully continuously decrease from year to year, as the electricity grids around the world become less emissions-intensive.

Ideally, the reporting of avoided emissions will be part of a broader impact assessment that includes further indicators relating to e.g. biodiversity and social impacts. If credible methodologies are developed, it would allow asset owners to make more informed decisions as they embark on aligning their portfolios with the changing preferences of their beneficiaries and society at large. Ultimately, making avoided emissions part of the decision-making process and developing transparent reporting can help support the direction of capital flows to where they are most urgently needed.

# 5 CONCLUSION

The financial sector needs to quickly reallocate capital, not only towards the decarbonisation of existing investments, but away from more polluting industries and technologies towards investments that have a place in a sustainable net-zero GHG emissions future. A prerequisite for actors to make informed decisions is reliable data transformed into relevant information using a logical and consistently applied methodology for emissions reporting.

The reallocation process can be supported by the reporting of avoided emissions, which is flexible in adapting to technological developments and can account for regional differences in grid emission factors. It is therefore well suited to support asset owners in realigning their investment strategies with the requirements of reaching net zero.

To ensure consistency, attributing avoided emissions should follow the same logic as the attribution of emissions across scopes 1, 2 and 3. Since the respective controlling entity has the most power to implement measures to reduce operational emissions of an investment, it is attributed 100% of the emissions caused. In turn, the controlling entity is also credited with the corresponding avoided emissions.

At the time of publication, there is no globally accepted understanding of how GHG emissions, including avoided emissions should be reported. Nevertheless, the industry is currently undergoing a consolidation process and overcoming the shortcomings of both regulation and voluntary initiatives will require close collaboration between official bodies and the private sector to ensure wide applicability of frameworks to actual market conditions. For financial institutions, being part of the discussion and exchanging ideas with market participants and other stakeholders is beneficial and even necessary to establish common standards.

SUSI Partners invests across the entire energy transition spectrum, from energy production and storage to energy efficiency and solutions enabling the use of clean energy. Accordingly, each of our investments contributes to the global race to net zero by bringing about measurable and independently verified $CO_2$ savings. We strongly believe that reporting avoided emissions can help investors understand the mitigative effect of an investment and be used as a crucial impact indicator when evaluating investments.

We look forward to further participating in, and actively contributing to this discussion, and are convinced that credible GHG reporting can be a tool of great importance for investors looking to include impact considerations into their investment decisions. We are hopeful that, in the context of the race to net zero, gains in transparency will promote the direction of capital to where it is most urgently needed.

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# LIST OF ILLUSTRATIONS



# GLOSSARY

| | |
|---|---|
| COP26 | 26th Conference of the Parties |
| ETS | Emissions trading system |
| GHG | Greenhouse gas(es) |
| GP | General Partner |
| IMF | International Monetary Fund |
| LP | Limited Partner |
| PCAF | Partnership for Carbon Accounting Financials |
| SBTi | Science-Based Targets initiative |
| SPV | Special Purpose Vehicle |
| UNFCCC | United Nations Framework Convention on Climate Change |

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