**Deutsche Bank**
Chief Investment Office

# PERSPECTIVES

## SPECIAL

## Decarbonizing portfolios: 10 key factors


Introduction: why decarbonize?

Defining the decarbonization objective

Portfolio implementation and management

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Introduction

# Why decarbonize?

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Global temperatures continue to rise. In response, governments have committed to reducing their economies' global carbon emissions to reach "net zero" emissions by 2050. Economies, governments and corporates are now in a process of transition towards more sustainable, lower carbon-emitting models. This is "decarbonization" – both a process and an outcome.

Investors, for their part, may have several underlying objectives in decarbonizing their portfolio. For example, through investing in firms or sectors with lower actual or projected emissions, they may want to **contribute** to overall process of global decarbonization. They may want to gain from the investment **opportunities** that will emerge in the transition to a low carbon sustainable economy. Or they may believe that decarbonizing a portfolio can mitigate **risks** involved in this transition (through reducing the risk of investing in what might become stranded assets), with implications for long-term portfolio performance.

In this report, we look at key factors involved in decarbonizing a portfolio. We start by discussing why a decarbonization **objective** needs to be carefully defined and the implications of this. We then look at challenges around **portfolio implementation and management** and possible ways to address them. These challenges include data availability, investment vehicles, security selection, optimisation and the two related issues of portfolio performance and risk.

It is worth stating clearly at the start that there is no single perfect agreed metric or method for portfolio decarbonization. Approaches will be adjusted as the transition to a more sustainable economy continues. But we do think it is now possible to identify 10 key factors around decarbonizing portfolios and how to approach them.

This report sets out several of the ways in which portfolios can be decarbonized. We do not assess the real-world impact of different carbon reduction options, or specific investment opportunities created by the transition to a more sustainable economy. Our emphasis here is in taking existing portfolios and decarbonizing them.

The views expressed in this report are those of Deutsche Bank's CIO Office. These are based on internal research as well as inputs from a program of joint discussions between Deutsche Bank and BlackRock's EMEA Investment & Product Solutions and Sustainable Investment Research & Analytics teams. We thank them for their insights.

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# In summary: key factors and implications

1. **Emissions measure:** relative emissions measures help select and manage investments in a decarbonization portfolio – but reducing absolute emissions levels must be the aim.

2. **Time perspective:** carbon emissions measures need to be forward-looking but with progress closely monitored. Decarbonization pathways are key to achieving the endpoint.

3. **Target type:** binary targets for decarbonization outcomes are complemented by benchmarking of progress and to validate some portfolio components.

4. **Asset class data:** equities and corporate debt data availability means they will be at the heart of a portfolio strategy. Decarbonization data for other asset classes is more challenging.

5. **Investment vehicles:** choosing between "active" and "passive" investment approaches will involve multiple factors and some potential compromises.

6. **Exclusions:** not investing at all in specific sectors can be a blunt tool, could affect portfolio performance and be counterproductive in encouraging the sustainability transition.

7. **Switching:** the ability to replace individual investments with others with better decarbonization metrics may be limited by the lack of alternatives and portfolio management considerations.

8. **Performance:** screening for decarbonization targets will reduce the investment universe, may skew portfolio composition, hence, some room for flexibility may be advisable.

9. **Risks:** decarbonization will require different short-term management of financial risks but could help reduce longer-term transition risks, e.g. around stranded assets.

10. **Optimization and regulation:** portfolios will require ongoing optimization in line with real-world decarbonization and changing regulation.

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# Defining the decarbonization objective

Any decarbonization objective needs to be credible and driven by real-world experience rather than accounting priorities. It needs a specified measure that is calculable, a time frame and an anticipated trajectory towards the objective. It must also be considered in the context of the overall process of global decarbonization.

#1

## Emissions measures

- Relative emissions measures help select and manage investments in a decarbonization portfolio – but reducing absolute emissions levels must be the aim.
- Implication: focus on relative emissions measures.

Reducing absolute levels of carbon emissions is the portfolio aim, but relative measures are also needed when selecting investments within asset classes. Forward-looking metrics, like implied temperature rise (ITR) provide a way of pulling together emissions measures at a portfolio level.

Ultimately, the aim is to reduce the absolute level of the global economy's carbon emissions. But there are problems with focusing only on an **absolute measure** (i.e. tons $CO_2$ emitted) at a portfolio level – not least because a larger portfolio will, ceteris paribus, create more emissions.

A more useful focus, therefore, could be on **relative measures** of carbon emissions when you compare firms for investment. But how do you measure "relative"?

One approach is to look at the **carbon footprint** of a firm, defined at the tons $CO_2$ emitted relative to a given measure. This should make it possible to compare carbon emissions between firms (and thus investments). But the problem is that the usual measure for comparison, a firm's capital value, will be affected by changes in its share price which may be unrelated to completely carbon emissions. (COVID-19, for example, initially pushed down stock markets and thus capital values – so artificially worsening firms' carbon footprints, at a time when the forced reduction of economic activity was in fact resulting in a sharp fall in actual carbon emissions.)

**Carbon intensity** measures instead the amount of carbon emitted by a firm for each unit of output or revenue. (For most organisations, with a range of different outputs, carbon intensity will be measured relative to revenues.) The appeal of carbon intensity is that it is easy to understand, can be refined further and easily weighted for inclusion in an index of investments. But, again, the measure for comparison (in this case revenues) can be affected by factors unrelated to climate change. Of course both capital value and revenues are

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expressed in money terms which means they are subject to inflation and exchange rate movements. But this is a topic for future work when clearer standards emerge.[1]

As well as the emissions measure, we also need to define the scope of the emissions that we are measuring. Three different levels are commonly used: **Scope 1** (those from activities owned by the firm), **Scope 2** (from the production of energy, e.g. electricity, which the firm then uses) or **Scope 3** (from other indirect sources of associated with the firm's activities). Deciding on the scope has implications for our ability to forecast emissions, and for potential double-counting (see below).

## Three possible portfolio decarbonization measures

| Measure | Pros and cons |
|---|---|
| **Absolute emissions**<br>Tons $CO_2e$<br>Firm's total GHG emissions | **Pros**<br>— Can be used across asset classes<br>— Allows portfolio decomposition and attribution analysis<br>**Cons**<br>— Larger portfolios will report larger emissions<br>— Lack of normalization limits comparability |
| **Carbon footprint**<br>Tons $CO_2e$ / market capitalization<br>Firm's total GHG emissions divided by market capitalization | **Pros**<br>— Allows comparison<br>— Allows portfolio decomposition and attribution analysis<br>**Cons**<br>— Changes in market capitalization can be misinterpreted<br>— Does not consider size of company operations (carbon efficiency)<br>— Equity and fixed income exposures react differently to enterprise value |
| **Carbon efficiency**<br>Tons $CO_2e$ / revenue<br>Firm's total GHG emissions divided by its revenues | **Pros**<br>— Captures emissions efficiency for firm's operations<br>— Can be used across asset classes<br>— Allows portfolio decomposition and attribution analysis<br>**Cons**<br>— Can be skewed by outliers<br>— Using revenue measure favours companies with higher pricing levels relative to peers<br>— Revenue shocks across specific sectors will have an impact |

**Source:** Deutsche Bank AG, BlackRock. Data as of July 2024.

Measuring carbon emissions – in relative terms – provides a way to choose between investments in individual sectors and, to some extent, between asset classes. A bridge between such measures and understanding investment choices' overall portfolio impact is the concept of **implied temperature rise (ITR)**. The point of ITR is to put companies' projected emissions in the context of an overall aim of reducing the global temperature rises

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to 1.5°: in essence, are firms' emissions undershooting or overshooting on what is needed to hold temperature rises down? Calculations on ITR are one component of a range of **science-based targets** (e.g., SBTi) relevant for assessing climate change.

### The Paris Agreement and decarbonization

Growing global concern about the dangers posed by climate change led to the 2015 Paris Agreement. This aims to limit global temperature rises to "well below" 2°C above pre-industrial levels – if possible below 1.5°C. To do this, emissions should be reduced, with "net zero" emissions by 2050. To keep on track for the 1.5°C target, it is estimated that emissions need to be halved by 2030.[2] It is now estimated that 92% of global GDP (at purchasing power parity) is now covered at a country level by net-zero targets.[3] Despite these developments, progress on reducing the actual level of carbon emissions has been slow. The Paris Agreement remains a pillar of market progress in setting a clear time horizon for the decarbonization process and for leading a drive for better reporting of carbon emissions.

#2

## Time perspective

- Carbon emissions measures need to be forward-looking but with progress closely monitored. Decarbonization pathways are key to achieving the endpoint.
- Implication: keep portfolios forward-looking.

Investment should be done on the basis of what we think will happen in the future. Firms' carbon reduction pledges provide an (imperfect) way to do this, if monitored against real world progress. Decarbonization pathways are key to achieving the endpoint.

Once it has been decided what exactly to measure, the next decision is over what time perspective we are measuring it. Are we concerned only about what carbon emissions are now (**actual emissions-based**)? Or are we more interested about what they might be in future (**target-based**)?

Both perspectives are useful. Actual emissions show us the reality of where we are starting from. But, with decarbonization an ongoing and ever-evolving process, we also need to invest based on what we expect will happen in future. Firms' targets for reducing carbon emissions, though imperfect, are probably the best available way to do this. (Although they will require continued monitoring for achievement and credibility.)

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## Backward- vs. forward-looking decarbonization measures

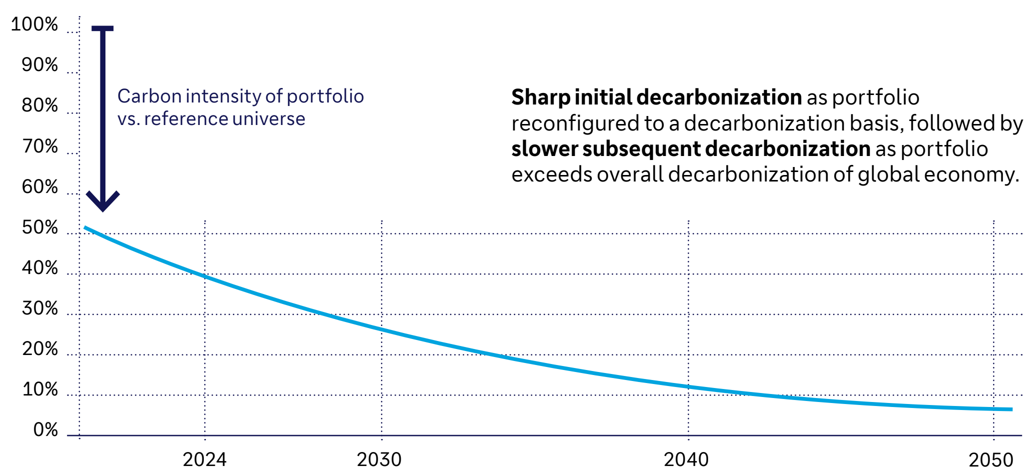
| | Emission based | Target based |
|---|---|---|
| | **Backward-looking**<br>– Actual emissions measures, e.g. in terms of carbon footprint or intensity | **Forward-looking**<br>– Can aim to meet binary targets, benchmark divergence or implied temperature rise measures |
| Pro | – Easier to measure<br>– Easier to understand<br>– Reflects actual emissions | – Puts focus on companies' emissions targets<br>– Avoid sectoral or regional bias inherent in divestment based only on existing emissions<br>– Based on and assessable vs. current emissions data |
| Cons | – Measures only the status quo - does not consider likely future developments<br>– So may tilt portfolio to divestment, rather than transformation<br>– Divestment results in sectoral or regional bias and lower diversification | – Reliant on company and investor assumptions and estimates<br>– Reliant on investor engagement to make sure targets/measures met<br>– Ongoing changes in real world emissions not captured |

**Source:** Deutsche Bank AG, BlackRock. Data as of July 2024.

The likely carbon-emission **pathways** towards this long-term objective are relevant. In reality, as Figure 3 illustrates, these are unlikely to be straight lines: an immediate fall in carbon intensity when a portfolio is first adjusted to follow a decarbonization objective (for example, by switching away from high carbon emitters) may well be followed by smaller year-on-year declines.

The likely decarbonization pathway will also be affected by the overall decarbonization of the global economy (e.g. by increased use of renewable energy). We will return to this issue of relative decarbonization as we discuss targets and performance below.

## One possible decarbonization pathway




**Source:** Deutsche Bank AG, BlackRock. Data as of July 2024. For illustrative purposes only.

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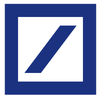

#3

# Target type

- Binary targets for decarbonization outcomes are complemented by benchmarking of progress and to validate some portfolio components.
- Implication: benchmarking as well as binary targets needed.

Portfolios are likely to need both clear binary targets for decarbonization outcomes and ways of benchmarking progress towards achieving these outcomes. Benchmarks may also provide a way of assessing and validating some portfolio components.

Once there is a portfolio objective, a measure and a timeframe, what sort of **target** should we set for the portfolio's decarbonization performance?

Most decarbonization portfolios are likely to have some form of **binary target** – a defined outcome that is either achieved or missed, for example in terms of the implied temperature rise (ITR) for a portfolio. You could also have subsidiary targets of, for example, the percentage shares of portfolio holdings which are committed to net zero outcomes or are science-based target initiative (SBTi)-validated.

Binary targets are relatively easy to understand and, usually, to identify as hit or missed (although calculation of the underlying indicators can be difficult). But they still need to be put in context and given a time horizon. A target-setting protocol and external validation might be relevant as well.

During the lifetime of a portfolio, you may need different ways of assessing progress on decarbonization. One way to do this is to measure the difference between the emissions pathway of an investment holding (or aggregate holdings in a portfolio) and the pathway of a reference benchmark – **benchmark divergence**.

Benchmarks will play a large part in portfolio decarbonization. The Paris Agreement (see Factor #1 above) sets a long-term goal/timeframe for restricting temperature increases. Different benchmark use cases arise from the necessary decarbonization that these temperature limits would imply. For example, you could **target** the amount by which the decarbonization of a portfolio should beat the overall decarbonization of the global economy.

Benchmarks can also be used in a quite different way: to define **minimum standards** for financial products related to decarbonization pathways. Two prominent examples of this would be the European Commission's Climate Transition Benchmark (CTB) and more ambitious Paris Aligned Benchmark (PAB).[4] The PAB is intended to approximate the path to achieving alignment with a 1.5° temperature rise: if a financial index is to be defined as PAB compliant, it must have a carbon intensity that is initially 50% lower than the parent index, and the carbon intensity of the index must be reduced by 7% each year on average – either through the individual companies in the index reducing their carbon intensity, or through changing the components of the index to reduce carbon intensity.

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Benchmarks themselves must be robust, credible and appropriate for the overall portfolio decarbonization objective. Assumptions and methodologies need to be understood and approaches can vary across data providers, posing challenged for a portfolio-level aggregation. Regulation will remain important in defining and setting relevant parameters (see Factor #10 below). Assessing benchmark divergence is discussed in depth in the GFANZ methodology.[5]

# Portfolio implementation and management

Multi-asset portfolios require both selection of individual assets and decisions on how to divide assets across different asset classes (asset allocation) based on expected relative asset class returns. In this section, our focus is on **how to select investments to achieve our overall portfolio decarbonization and financial performance objectives** and then **how to manage the resulting portfolio**.

#4

## Asset class data

– Equities and corporate debt data availability means they will be at the heart of a portfolio strategy. Decarbonization data for other asset classes is more problematic.
– Implication: Focus approach on available data on equities and corporate debt.

Many equities and corporate credit issuers publish emission commitments and will, therefore, be central to a portfolio decarbonization strategy. There are conceptual problems with calculating emissions for sovereign debt. Data for other asset classes and private markets is rare. The first consideration is the availability of decarbonization data. This varies between asset classes.

**Equities:** around 64% of firms in the MSCI AW index are, for example, currently publishing carbon reduction pledges. These data gaps mean that any aggregate carbon emissions projections for the equities component of a portfolio require estimation via heuristics (problem-solving short-cuts) – e.g., assuming that the emissions of firms that don't issue decarbonization pledges will grow by a given amount each year – which may turn out to be wrong.

The further future time horizons are extended, the more uncertainty around the accuracy of emissions predictions grows. Broadening the scope of carbon emissions measured (see discussion on Scopes 1, 2 and 3 above) will also add to forecast uncertainty.

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**Fixed income:** around 61% of total debt issuance is accounted for by government bonds and 18% comes from agencies, local authorities and supranational. The remaining 21% is in the form of corporate credit.

On **corporate debt** we can get reasonable clarity on most issuing firms through their published carbon-reduction commitments. Aside from the size of the market, there may be other reasons to include corporate bonds in a portfolio decarbonization strategy e.g., the ability of bondholders to exert influence over firms' priorities before or at the point of issuance. There has also been continued growth in global green, sustainability and social bond markets where proceeds are put to specific use, with the OECD expecting debt-related instruments to lead the way on transition finance.[6]

Carbon emissions data on **sovereign bonds** is more difficult. It is possible to look at the carbon intensity of the economy relative to GDP, at an aggregate country level. But carbon emissions in a country will include emissions from corporates as well as government-related entities. This introduces a problem of "double-counting" of emissions in any emissions calculation, in that you will already be accounting for corporate emissions in other asset classes (equities and bonds). In other sovereign bonds assessments (e.g. ASCOR), the focus is really on climate risk rather than carbon reduction carbon commitments.

Other asset classes (e.g. derivatives investments and alternatives) are currently out of scope for a systematic decarbonization strategy, given the usual lack of publicly-reported decarbonization targets.

#5

# Investment vehicles

- Choosing between "active" and "passive" investment approaches will involve multiple factors and some potential compromises.
- Implication: Mix "active" and "passive" approaches as appropriate.

Investors face an apparent choice between managing individual securities ("active" management) and buying pre-defined index-type vehicles ("passive"). Many decarbonization portfolios will combine the two. Investors may need to accept some compromises with passive vehicles.

Which **investment vehicles** should you use to pursue your overall decarbonization objective? One choice is between managing individual investment holdings within a portfolio and buying index type investment vehicles ("active" vs. "passive" investment). The latter can be designed to follow a specific decarbonization pathway (e.g. exchange-traded funds based on CTB/PAB discussed above).

However, an investor here may have to accept some **potential compromises**. An ETF with a decarbonization target may, for example, include sectors which an ESG investor does not want to include in their portfolio for other reasons (e.g. social considerations), possibly making it difficult to hit both decarbonization targets and other portfolio management agreements.

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#6

# Exclusions

- Not investing at all in specific sectors can be a blunt tool, could affect portfolio performance and be counterproductive in encouraging the sustainability transition.
- Implication: don't rely on exclusions, focus on transition.

Exclusions of sectors and subsectors are a blunt tool and need to be used carefully. In addition to changing a portfolio's return/risk characteristics, they may also be counterproductive in aiding the overall transition towards sustainability. In many portfolios, we would aim for a more sector-neutral approach.

The practice of excluding certain sectors or subsectors (e.g. hydrocarbons firms) from investment has a long history within environmental or socially-targeted investment. However, within a decarbonization portfolio, exclusions can be a blunt tool and need to be considered carefully, not least because they can change a portfolio's **return/risk characteristics**. The impact of exclusions will be dependent on the measure used. But, in general, exclusions based on decarbonization measures may **tilt** a portfolio away from emerging markets (in particular Asia) and towards developed markets. Similarly, they may reduce exposure to energy, materials and utilities while increasing exposure to sectors such as healthcare and financials.

Exclusions also bring us back to the question of what exactly a portfolio is for. If a portfolio is focused on the future, will exclusions help or hinder the process of transition to a sustainable low-carbon economy? It may not make sense to completely exclude investment in the energy sector, for example, if the growth in renewables promises to have a positive impact on global decarbonization. Our focus would therefore be on trying to tilt towards carbon-efficient/ promising names within a sector rather than automatically excluding all firms in high carbon-emitting sectors.

#7

# Switching

- The ability to replace individual investments with others with better decarbonization metrics may be limited by the lack of alternatives and portfolio management considerations.
- Implication: tilt to names with more promising decarbonization metrics where practical.

We would focus on tilting towards the most carbon-efficient firms in a sector, but the ability to switch investments may be limited by the availability of alternatives or other practical factors.

Switching involves changing individual holdings within a sector, to those with better decarbonization metrics (e.g. “best in class”). Switching tactics will depend on available metrics, investor aims, costs and, crucially, the ability to find credible investment alternatives (that are not ruled out for investment for other reasons).

Switching individual investments, like sectoral exclusions, may also have some **knock-on effects** for the portfolio's composition and management. Removal of firms will, for example, require reweighting of remaining holdings. It may also be necessary to have self-imposed limitations on switching strategies for cost or risk reasons.

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# #8 Performance

- Screening for decarbonization targets will reduce the investment universe, may skew portfolio composition, hence, some room for flexibility may be advisable.
- Implication: set investment restrictions but ensure/ maintain flexibility.

Screening for decarbonization targets at an individual investment level will reduce the investable universe with implications for portfolio composition and financial performance. Some room for flexibility around targets may be advisable.

Changing a portfolio's composition to meet a decarbonization objective, e.g., through exclusions and switching, will have an impact on its expected financial returns and risk profile. Some complex decarbonization strategies may also involve extra costs.

An additional factor here is how a decarbonization strategy restricts the available **investment universe**. This will depend on how the decarbonization objective is pursued, the degree of flexibility allowed around this objective, and how the overall real economy decarbonization is progressing.

Restrictions can be large but not insuperable. As an example, the table below shows the share of companies currently assessed by MSCI that meet given implied temperature rise (ITR) targets. If your ITR target is <2.0°C, for example, the share is 34%. (If you were selecting from Deutsche Bank Private Bank's pre-screened ESG stocks, this share would increase to 41%.)

## Impact of using ITR filter on size of investment universe

Based on the total number of companies assessed by MSCI on an ITR basis. No. of companies shows the number of companies that would still be eligible for investment under each temperature rise scenario.

| Implied temperature rise (ITR) | No. of companies | % of companies |
|---|---|---|
| <1.5° | 748 | 7% |
| <2.0° - >1.5° | 3,152 | 27% |
| <3.5° - >2.0° | 5,219 | 46% |
| >3.5° | 2,343 | 20% |
| Total | 11,462 | 100% |

**Source:** Deutsche Bank AG, MSCI. Data as of July 2024.

This is not just a matter of reducing the number of securities you can invest in. As discussed under Factor #3, applying an ITR requirement can skew a **portfolio's sector composition**, away (for example) from sectors such as energy and materials and towards sectors such as financials and healthcare, with different investment characteristics. The regional composition might also change.

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These restrictions are imposed by your own objectives. There is room for flexibility, even within a stated long-term target (if, for example, you do not require a portfolio to exactly meet stated decarbonization targets every year). Restrictions may also ease if the overall global economy continues to decarbonize, so increasing the share of firms that meet stated ITR targets.

#9

# Risks

- Decarbonization will require different short-term management of financial risks but could help reduce longer-term transition risks, e.g. around stranded assets.
- Implication: consider impact of decarboniza-tion on different types of climate risk.

Decarbonization may change the financial risks characteristics of a portfolio requiring different risk management. It may help reduce longer-term risks associated with the sustainability transition, e.g., stranded assets. It may also help portfolios anticipate market repricing of some sectors.

As noted above, the decarbonization process may change the financial return and risk characteristics of a portfolio (e.g., via changed sectoral weightings), requiring some rethinking of short-term portfolio risk management.

Decarbonization may, however, help reduce longer-term risks associated with climate change and the move to a lower-carbon world. These include **stranded assets**, physical assets which are no longer viable due to regulation or changing patterns of demand. Writing these down could have a significant impact on the value of individual and sectoral portfolio holdings.

The forecast numbers here are large, if imprecise. The International Panel on Climate Change (IPCC), for example, forecasts USD1–4 trillion in stranded fossil fuel assets between 2015-2050 if global warming is limited to 2°C.[7] The Carbon Tracker thinktank projects >USD1 trillion in stranded oil and gas assets if warming is limited to 1.5°C, out of which around USD600bn is held by listed companies.[8]

A related question is to what extent financial markets will anticipate future change and reprice individual asset classes/sectors. A range of studies are already exploring this issue (e.g., the extent of the “greenium” on sovereign bonds[9], trends in yield spreads on bonds issued by high carbon-emitting industries[10] and the possible impact on firm-level equity returns of changes in emissions levels).[11] Clear answers to these questions are unlikely but our working assumption is that, ceteris paribus, moving portfolios onto a lower carbon emissions pathway will help reduce transition risks.

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# #10 Optimization and regulation

- Portfolios will require ongoing optimization in line with real-world decarbonization and changing regulation.
- Implication: expect ongoing portfolio optimization and focus on investment outcomes within regulatory guardrails.

Portfolios may require readjustment for operational reasons, progress in real economy decarbonization and to reflect different climate change scenarios. Debates around regulation will continue, with growing regional divergence possible.

Progress towards the decarbonization objective will not be in a straight line, is unlikely to be consistent, and may require **readjustment** of multiple factors during the lifetime of the portfolio. (For example, to increase liquidity, lower costs, improve diversification, enhance yields or reduce operational complexity, improve portfolio climate profile.)

Market understanding of the impact of decarbonization market returns/risk will change over time and we may also need to consider different climate change outcome scenarios.[12] We think, however, that the main decarbonization technologies and methods have now probably been identified and we do not expect a radical change in direction here.

In addition, future changes in **regulation** could impact the financial products available for inclusion in a portfolio, as well as the broader social and investor debate, and require portfolio adjustment. One recent example of this was the May 2024 final decision by the European Securities and Markets Authority (ESMA) on the application of fund names using ESG or sustainability-linked terms. Regulation debates may also not reach firm conclusions and there is the potential for regulatory divergence between regions (e.g. on product labelling).

The debate here Is likely to continue: for example, there is an ongoing debate around the possibility of defining transition investing as a category, e.g., through the review of the Sustainable Finance Disclosures Regulation, with potentially major implications for transition investments such as energy. Hence, the ESMA fund name guidelines are only one component of the European picture (with regulation from individual EU members and the UK) and further regulation is possible in other regions. Regional divergence in labelling requirements could become increasingly challenging.

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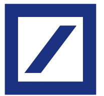

# Conclusion

So what, in reality, should a portfolio with decarbonization in focus look like? In summary, we think it is likely to be characterized as follows:

- use **relative emissions measures** to manage the portfolio (Factor #1);
- be largely **forward-looking**, with an emphasis on targets and pathways (Factor #2);
- **complement** binary targets with benchmarking of overall progress and components (Factor #3);
- be **data-intensive** in assessing equities and corporate credit asset classes (Factor #4);
- realize that choices between **investment vehicles** may require compromises (Factor #5);
- be focused on **transition investment**, rather than over-rely on sectoral exclusions (Factor #6);
- so **tilt** where possible to the most carbon-efficient/promising names within a sector (Factor #7);
- understand implications of reduced **investment universe** and need for target flexibility (Factor #8);
- consider how decarbonization could impact **risks** associated with the sustainability transition (Factor #9);
- and will **evolve** over time, reflecting operational optimization, real-world decarbonization and regulatory change (Factor #10).

We believe that the structural and management issues discussed above can be addressed within decarbonization portfolios, and that such portfolios are likely to prove attractive to many investors on purely economic grounds.

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# Glossary

A **benchmark** is a defined variable to which a value or result can be compared.

**Benchmark divergence** is the extent to which a forecast or actual outcome diverges from the benchmark.

**“Best in class”**: something that is the best of its kind, on a given measure.

**Binary target**: a pre-defined target that is clearly hit or missed.

**Carbon dioxide**: a chemical compound ($CO_2$) that when emitted to the atmosphere is a contributor to climate change.

**Carbon footprint**: a measure of carbon emissions ($CO_2$) relative to another given measure, for example a firm’s capital value, but many different comparators are possible.

**Climate change**: a term used to describe climatic shifts during the earth’s history, for example the current global warming and its impacts.

A **Climate Transition Benchmark** includes objectives on greenhouse gas emissions and the transition to a low carbon economy, used to select and verify components of the benchmark.

**Corporate credit** is debt issued by a corporation.

**Decarbonization** is the process of reducing carbon emissions by a corporate, other body, government or country.

**Decarbonization pathway** is the route over time by which a body plans to reach a long-term decarbonization objective.

**Derivatives** are financial contracts the price of which is dependent on underlying assets.

**Diversification** refers to the dispersal of investments across industries, asset types, regions and so on with the aim of reducing portfolio risk or boosting risk-adjusted returns.

**Equities** are shares in the ownership of companies, traded on public exchanges or privately.

The **European Securities and Markets Authority (ESMA)** is an official EU regulator of financial markets and products.

**Exclusion**, in an investment context, refers to excluding certain sorts of investment from a portfolio, often for non-financial reasons.

**Greenium** refers to the difference in pricing between sustainable debt instruments and non-sustainable instruments.

**Greenhouse gas emissions** from human activities include carbon dioxide, methane, nitrous oxide and other gases.

**Implied temperature rise (ITR)** is a methodology used to calculate if the carbon emissions of companies (or investment funds or portfolios) are in line with meeting global temperature goals.

**Investment** universe refers to the range of investments that can be included in a portfolio.

**MSCI** is an independent financial services provider of market indices and other analytical tools.

The **MSCI AC World Index** tracks the performance of around 1,600 large- and mid-cap stocks across 23 developed- and 23 emerging-market countries.

**NZAOA (the Net-Zero Asset Owner Alliance)** is a UN-convened group of institutional investors.

**Optimisation** is an ongoing process of maintaining the best possible portfolio, for example via asset selection, to pursue a given objective.

The **Organisation for Economic Co-operation and Development (OECD)** has 35 member countries and has the objective of encouraging economic progress and world trade.

**Paris Agreement** refers to a 2015 agreement under the framework of the United Nations Framework Convention on Climate Change.

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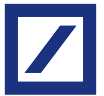

## Glossary

**Paris-Aligned Benchmark (PAB)** indices are established under EU regulations intended to define a pathway to meet the 1.5°C temperature rise goal.

**Portfolio**: a range of investments held by an individual or organisation.

**Private markets** are used to trade investments between firms or individuals without the use of a public exchange.

**SBTi (the Science-Based Targets Initiative)** is a corporate climate action organisation.

**Sustainable transition** means moving the global economy onto a more environmentally-sustainable model.

**Switching** is replacing individual investments in a portfolio with others, which can be done for non-financial reasons.

**Sovereign bonds** are debt issued by a national government.

**Transition finance** is the continued financing of countries and firms (existing and new) as part of the transformation to more a more sustainable economic model.

**Weighting** is adjusting the contribution of individual data points to a data set (e.g. index) to account for specific other factors.

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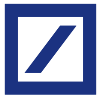

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