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# Sustainable Development Goals as a framework for climate investment

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# The United Nations has been the leading proponent of inclusive and sustainable economic growth

*"At its essence, sustainability means ensuring prosperity and environmental protection without compromising the ability of future generations to meet their needs"*

Ban Ki-moon, Former Secretary General, United Nations


Source: UN

# Index



SUSTAINABLE DEVELOPMENT GOALS

Section 1

# What are the UN's Sustainable Development Goals?

**The Sustainable Development Goals (SDGs) are a collection of 17 global goals set by the United Nations and adopted by all 193 members of the UN in September 2015.** The 17 SDGs consist of 169 individual targets with metrics designed to guide global sustainable development priorities to 2030.

The SDGs were designed to replace the earlier Millennium Development Goals that ended in 2015. The key difference between the SDGs and the MDGs is that the former make no distinction between developed and developing countries and have specific, distinct metrics.

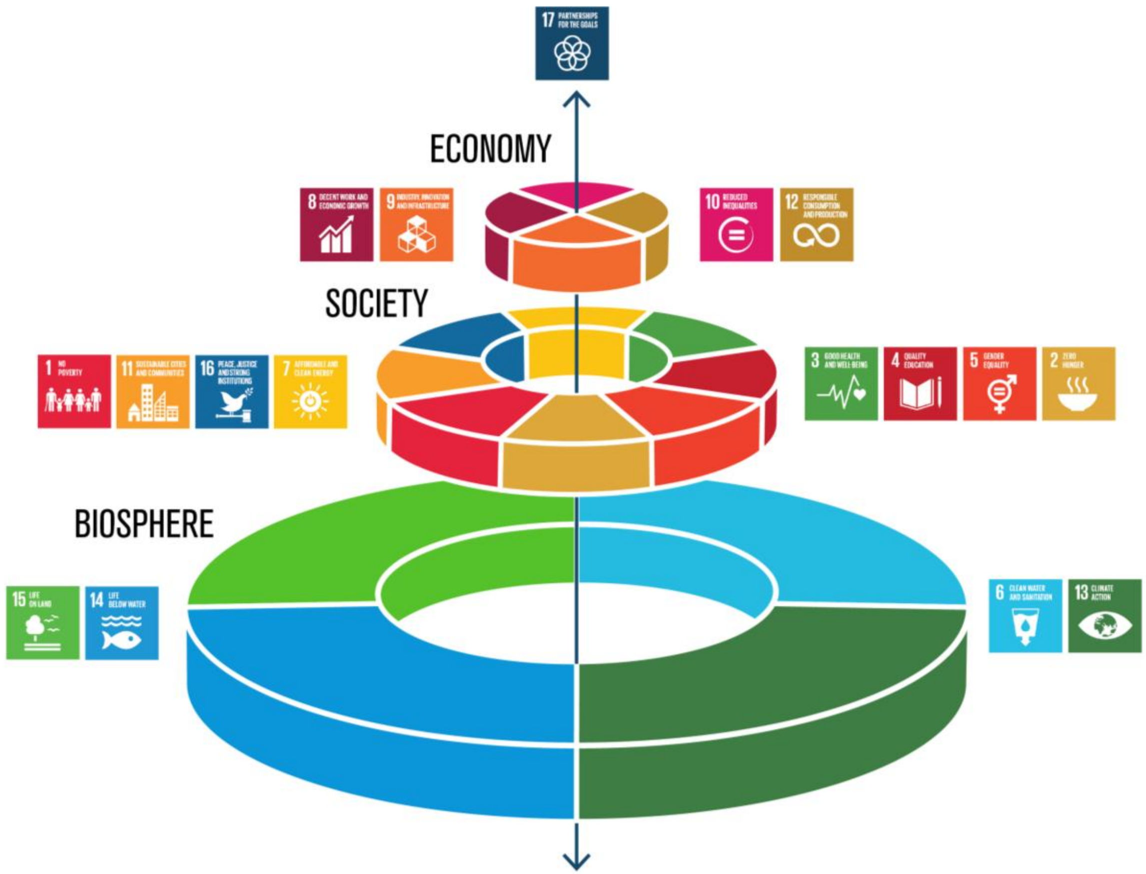

Source: UN

Section 1

# Meeting the SDGs will require new capital or a re-routing of existing flows

## Linking SDGs to economic and societal activities

Source: UN, BBVA GMR




- **The UN Commission on Trade and Development (UNCTAD) estimates that meeting the SDG targets will require USD5-7 trillion in investment each year to 2030.**
- **Given that governmental spending and development assistance flows make up c.USD1 trillion per year, new flows of private-sector capital are needed, either through new allocations or by re-routing existing flows**

Section 1

# SDGs are a guide to responsible investment mandates

- **SDGs, with their broad focus, yet specific targets and metrics, provide a useful template for responsible investors to benchmark their investment strategy.** This has been recognised by the UN Principles for Responsible Investors (PRI), which are aligned with SDGs as a framework for responsible investment. UN PRI signatories currently number 1,714, including 1,280 global investment managers, and have AuM of c.USD68.4trn.

## Macro Considerations

### Opportunities:

- SDG achievement will be a key driver of global economic growth and, by extension, the main structural source of financial returns in the long term, driving growth in corporate revenues and earnings.
- Creation of a viable model of inclusive economic growth will sustain corporate profits, with a lower risk of 'Minsky moments' driven by societal divisions, injustices and/or adverse environmental changes.

### Investment Considerations:

- Large institutional investors relying on modern portfolio theory can be considered 'universal owners,' making their investment returns dependent on the sustainability of the global economy. Ignoring such risks can impair their financial performance should economies and markets not be sustainable in the long-run
- Failure to achieve SDGs will affect all countries and sectors to some degree, creating macro financial risks. Investors are exposed to these risks through the companies in which they are invested and failure to recognise sustainable drivers in corporates can lead to investment risk

## Micro Considerations

### Opportunities:

- Companies globally are moving toward more sustainable business practices. 'Responsible Investment' mandates are growing exponentially, with a focus on climate themes. Changing business practices, products and services provide new investment opportunities.
- Investors can 'buy in' to opportunities that target specific SDG themes and sectors (e.g. clean technology stocks, low-carbon infrastructure, and green bonds).

### Investment Considerations:

- In the past 10 years, responsible investment has evolved from being primarily exclusionary, to focusing on identifying companies that can effectively manage Environmental/Social/Governance (ESG) risks and opportunities.
- At some point, a significant proportion of external costs, such as environmental damage or societal pressures, may be forced onto corporate balance sheets via policy action. SDGs provide underlying targets that can help investors navigate uncertainty related to the timing and extent of risk.

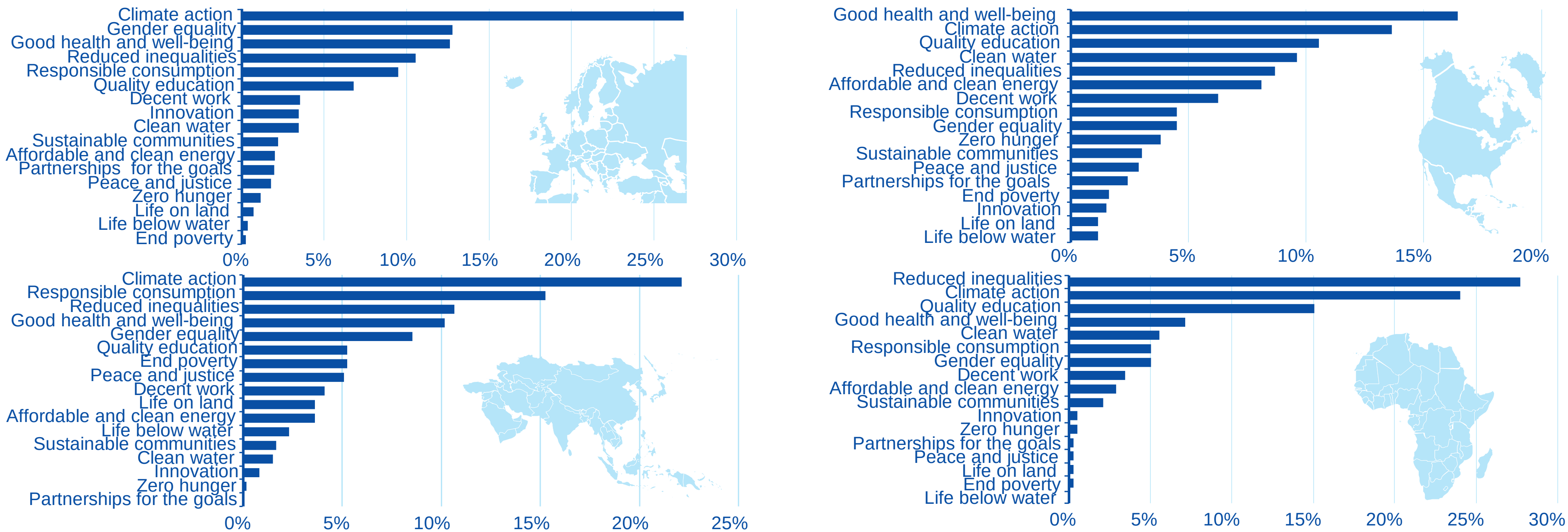
Section 1

# Companies increasingly aligned with SDG approach

- **According to the SDG Commitment Report 100 (released April 2017), 82% of the global blue chips it analysed disclosed partial or full commitment to the SDGs, representing a market cap of USD9.7trn.** As of August 2017, Trucost identified investment managers with USD4trn in AuM making SDG commitments, including APG and PPGM in Europe and CalPERS and State Street in the US.
- Based on SDG pledges made so far, European and Asian companies are mainly focused on climate action. African companies have demonstrated a commitment to reducing inequalities, and North American companies show a strong commitment to good health and well-being.

## SDG Commitment Report 100: tracking alignment to SDGs

Source: UN, BBVA GMR




Share of coverage on specific SDG

Section 1

# Using SDG's to determine an 'impact-driven' investment strategy

### Impact themes and their relationship to the Sustainable Development Goals

Source: BBVA GMR

**Climate stability**

- Limit GHG levels to stablise global temperature rise under 2C

Goals: 9, 13

**Basic needs**

- Food, water, energy, shelter, sanitation, communications, transport, credit and health for all

Goals: 1, 2, 3, 6, 7, 10

**Healthy ecosystems**

- Maintain ecologically sound landscapes and seas for nature and people

Goals: 14, 15


**Well-being**

- Enhanced health education, justice and equality of opportunity for all

Goals: 3, 4, 5, 10, 11, 16

**Resource security**

- Preserve stocks of natural resources through efficient and circular use

Goals: 12

**Decent work**

- Secure, socially inclusive jobs and working conditions for all

Goals: 8, 9, 10

Section 1

# Metrics for SDG-linked responsible investment themes

## SDGs all have granular metrics which investors can target

Source: BBVA GMR, UN

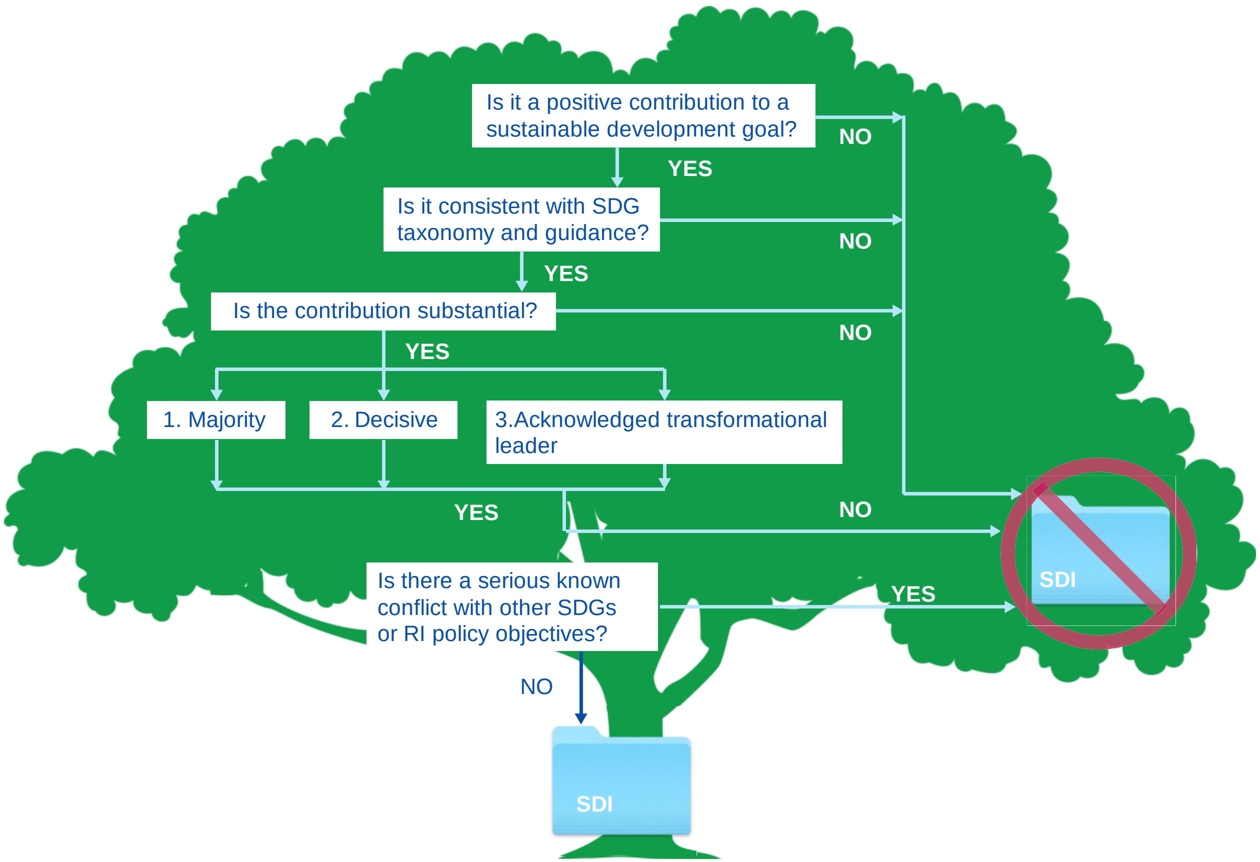
| Theme | Metric | Rationale | Refinements |
|---|---|---|---|
| **Basic needs** | Revenue from products serving low-income groups (USD)* | Proxy for addressing needs of low-income groups | • Purchasing power<br>• Restriction to 'basic needs' products<br>• Fair dealing<br>• Product ethics |
| **Well-being** | Total tax burden (USD)* | Proxy for public value contribution | • Corruption record of government<br>• Negative externalities (alcohol, air pollution, tobacco, sugar)<br>• Revenue from healthcare, education, justice and environmental protection |
| **Decent work** | Number of jobs | Proxy for livelihoods supported in operations + supply chain | • National level of unemployed and vulnerable workers<br>• Living wage<br>• Stable (open-ended) contracts<br>• Labour conditions<br>• Indirect job creation |
| **Resource security** | Consumption of virgin material (tonnes)* | Proxy for resource burden and waste of operations + supply chain | • Scarcity of hard commodity<br>• Regeneration of soft commodity<br>• Toxicity |
| **Healthy ecosystems** | Land footprint (hectares)* | Proxy for ecosystem burden of operations + supply chain | • Level and trend of national ecological deficit<br>• Full ecological footprint<br>• Restoration of ecosystem services |
| **Climate stability** | Scope 1–3 GHG emissions ($tC0_2e$) | Proxy for climate burden of operations + supply chain + product use | • Avoided emissions from product use<br>• Sector-specific targets and contributions<br>• Alignment with 2°C scenario |

Section 1

# Determining whether an investment aligns with SDG

## Sustainable development aligned investment (SDI) decision tree

Source: BBVA GMR, APG




- **'Contribution Substantial'**: this is where either the use of proceeds of a bond or the issuer itself has a majority of its business model aligned with one or more SDGs.
- **'Transformational leader'**: this is investing in a company whose business model is undergoing a transformation towards a model linked with the SDGs.
- **'RI Policy Objectives'**: an investor's own objectives as regards responsible investment.

Section 1

# SDGs are compatible with the Paris Agreement and the financing of global low-carbon energy pathways

## Paris Agreement

**Limit temperature increase to 1.5 – 2ºC above pre-industrial levels**


## Sustainable development goals

**17 goals for sustainable development by 2030**


**The United Nations Environment Programme (UNEP) Finance Initiative looks to facilitate financing flows that are required, as part of the Paris Climate Agreement, to be in line with the broader range of SDGs, in particular those that are environment-related.**

Section 1

# Environment-related SDG and investible sub-goals: Clean water and sanitation

6 CLEAN WATER AND SANITATION

| | | |
|---|---|---|
| **6.1: Access to safe and affordable drinking water** | **Water supply & distribution** | Network construction, maintenance, equipment |
| **6.2: Access to adequate and equitable sanitation and hygiene** | **Wastewater discharge** | Network construction & maintenance |
| | **Hygiene** | Personal hygiene products |
| **6.3:Improve water quality** | **Water treatment** | Network construction, maintenance, equipment, desalinisation |
| | **Water testing** | Laboratory equipment & services |
| **6.4: increase water-use efficiency and reduce the number of people suffering from water scarcity** | **Water quantity** | Water-saving systems, technologies and water metering |
| | **Water storage** | Storage infrastructure, storage tanks |

See also SDG 13.1: *‘strengthen resilience & adaptive capacity to climate-related hazards and natural disasters’*

Source: BBVA GMR, APG

Section 1

# Environment-related SDG and investible sub-goals: Affordable and clean energy

7 AFFORDABLE AND CLEAN ENERGY

| | | |
|---|---|---|
| **7.1 Access to affordable, reliable and modern energy services** | **Energy infrastructure** | See SDG 9.1: *'develop quality, reliable, sustainable & resilient infrastructure'* |
| **7.2 Increase share of renewable energy** | **Renewable energy** | Electricity and/or heat generated from wind, solar, biomass, geothermal, hydro, waste and/ or tidal sources |
| | **Alternative fuels** | Hydrogen, fuel cells and advanced biofuels |
| | **Supporting products and services** | Renewable technology suppliers, enzyme suppliers |
| **7.3 Double the global rate of improvement in energy efficiency** | **Built environment** | Metering, GRESB Top Quintiles |
| | **Efficient lighting** | LED lights, efficient lighting service providers |
| | **Industrial production** | Efficient production tools, resource management systems |
| | **Energy-efficient transport** | Reduction in use of fuel |

Source: BBVA GMR, APG

Section 1

# Environment-related SDG and investible sub-goals: Industry, innovation and infrastructure

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

| Sub-goal | Area | Examples | Related SDG |
|---|---|---|---|
| **9.1 Sustainable & resilient infrastructure** | **Transportation infra** | Public transportation and sustainable logistics | |
| | **Social infra** | Schools, hospitals, care homes (buildings only) | |
| | **Water infra** | Clean drinking water, distribution networks and waste water treatment | See SDG 6: *'clean water and sanitation'* |
| | **Waste infra** | Waste collection infra, waste treatment facilities | See SDG 11.6: *'reduce adverse per capita environmental impact of cities* |
| | **Communications infra** | Networks, antenna towers, fibre cables | |
| | **Energy infra** | Transmission and distribution of renewable energy and alternative fuels | See SDG 7: 'renewable energy generation' |
| **9.3 Access of small-scale enterprises to financial services** | **Financial services, particularly in developing countries** | Microfinance, electronic payment systems, other SME financial services | |
| **9.4 Upgrade infrastructure and retrofit industries to make them sustainable** | **Resource efficiency** | Recycling, energy efficiency, reduced fuel consumption | See SDG 7.3 *(double rate of improvement in energy efficiency)* and SDG 12 *(responsible consumption and production patterns* |

Source: BBVA GMR, APG

Section 1

# Environment-related SDG and investible sub-goals: Sustainable cities and communities

11 SUSTAINABLE CITIES AND COMMUNITIES

| | | | |
|---|---|---|---|
| **11.1 Access to safe and affordable housing and basic services** | **Affordable housing** | Public / private partnerships to build (social) housing, student housing | |
| | **Safe housing** | Development, renovation, reinforcement of houses | |
| | **Basic services** | Access to waste collection, electricity, etc. | See SDG 6 *(clean water and sanitation)*, SDG 7 *(affordable and clean energy)*, SDG 11.6 *(reduce adverse per capita environmental impact of cities)* |
| **11.2 Access to safe, affordable and sustainable transport systems** | **Sustainable transportation systems** | Public transport, rail infra, transport sharing | See SDG 9.1 *(develop resilient infrastructure)* and SDG 12.2/5 *(responsible consumption and production)* |
| | **Improving road safety** | Traffic management systems, vision & sensor systems, airbags | |
| **11.5 Reduce impact of disasters** | **Reduce human impact** | Emergency packs, survival kits, shelter tents | |
| | **Reduce economic losses** | Catastrophe (re)insurance, catbonds | See SDG 13: *'climate action'* |
| | **Upgrade adaptation measures** | Flood protection, dams | |
| **11.6 Reduce adverse per capita environmental impact of cities** | **Waste management** | Recycling, waste to energy | |
| | **Air quality** | Sustainable transport, EV infra | |
| | **Transport substitutes** | Virtualization, videoconferencing | |

Source: BBVA GMR, APG

Section 1

# Environment-related SDG and investible sub-goals: Responsible consumption and production


| Sub-goal | Area | Investment | Climate link |
|---|---|---|---|
| **12.3 Reduce food waste** | **Retail** | Packaging for spoilage prevention, recycling of food waste (to feed) | See SDG 13.1: *'strengthen resilience and adaptive capacity to climate related hazards'* |
| | **Post harvest** | Equipment for improved logistics (cold storage), Ingredients for spoilage prevention (enzymes) | See SDG 13.1 (above) |
| **12.4 Management of chemicals and wastes throughout their life cycle and reduce the release into the environment** | **Emission reduction equipment** | Filters, emission control | |
| | **Sustainable substitutes** | Biochemicals | |
| **12.2 Sustainable management and efficient use of natural resources, and 12.5 Reduce waste** | **Prevention** | Waste management, design, sharing economy | |
| | **Reduction** | Process improvements | |
| | **Recycling and reuse** | Recycling operations, waste-to-energy | |

Source: BBVA GMR, APG

Section 1

# Environment-related SDG and investible sub-goals: Climate action

13 CLIMATE ACTION

**13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries**

**Infrastructure**

Flood protection, flood-resilient buildings

**Adaptive capacity**

Water storage, weather forecasting technologies, sensors (e.g. atmosphere, ocean temperatures)

**Insurance**

Climate risk-related insurance, catastrophe reinsurance, weather bonds

See also SDG 11.5: *'reduce impact of disasters'*

**13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning**

Source: BBVA GMR, APG

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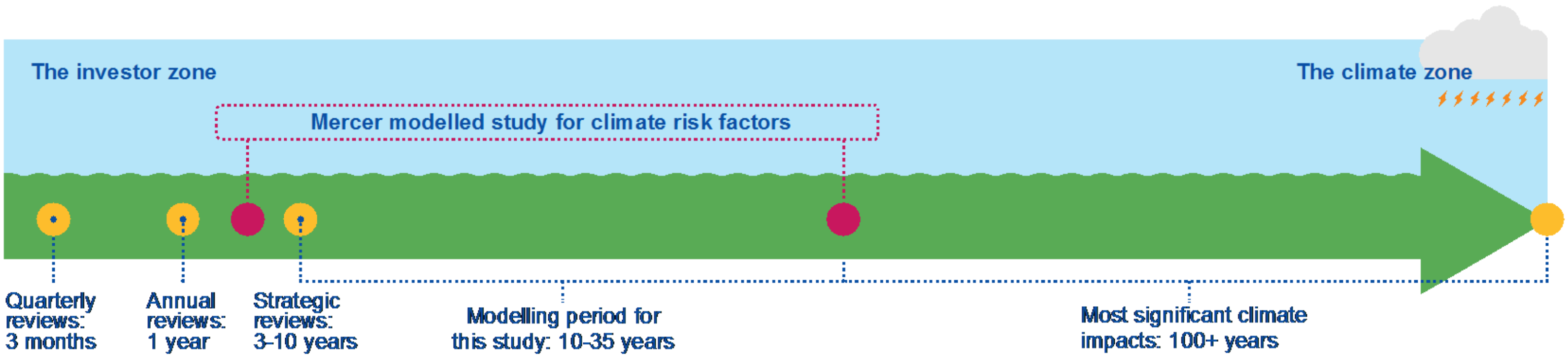
Section 2

# Climate change requires investors to consider longer than usual investment horizons

## The timeline challenge

Source: Mercer, BBVA GMR




1. Portfolio management review cycles tend to be no longer than 10 years, particularly total-return open-ended fund structures. Within this timeframe, the most significant risks are likely to be policy-driven, e.g. carbon pricing, and the prohibition of certain activities, with resultant exposure to 'stranded assets'.

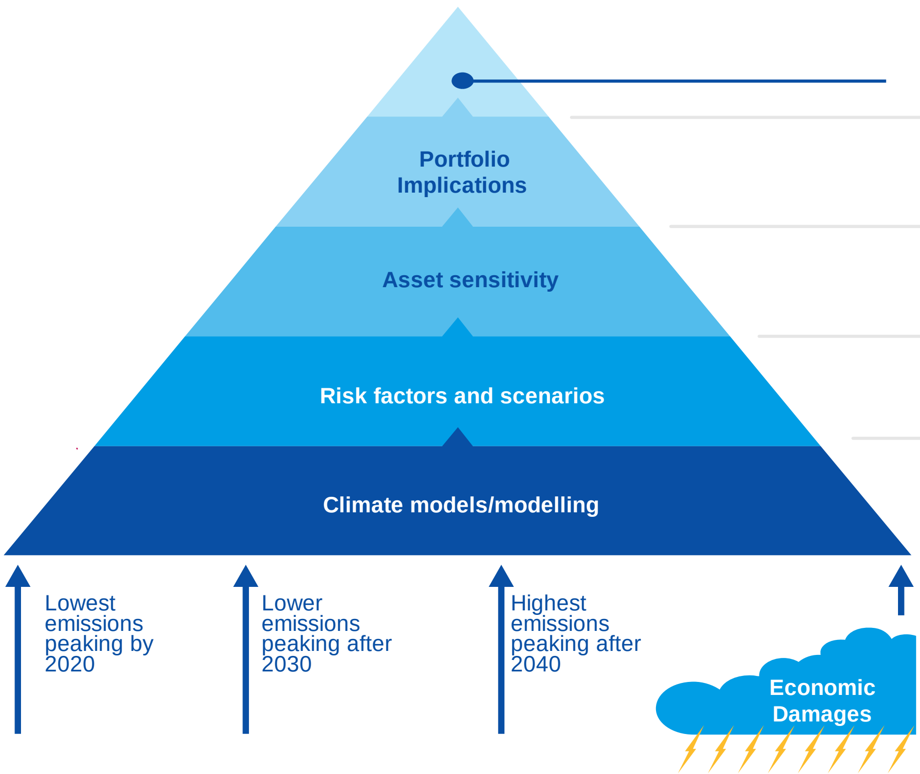
2. In terms of climate modelling, particularly in the Intergovernmental Panel on Climate Change (IPCC) projections, most impact modelling lasts 10-35 years. It is, however, most likely that significant financial impacts from climate change will lie further into the future, according to Mercer (*Investing in a time of climate change, 2017*).

Section 2

# Long-term projections require many assumptions

## Getting to the point: From climate modelling to portfolio implementation

Source: Mercer: Investing in a time of climate change (2017)




Modelling the investment implications helps investors identify the risks and opportunities posed by climate change in their portfolio, and then act accordingly.

**Portfolio implementation**

Numbers to represent the asset sensitivity and the scenario pathways are plugged into Mercer's investment modelling tool to estimate the climate impact on return.

Sensitivity to the four climate risk factors is assigned to different industry sectors and asset classes.

Four climate risk factors and four climate scenarios provide a framework for considering climate change risks and potential pathways over time.

Integrated Assessment Models estimating the cost of mitigation, adaptation, and physical damages to identify climate change scenarios most relevant to investors.

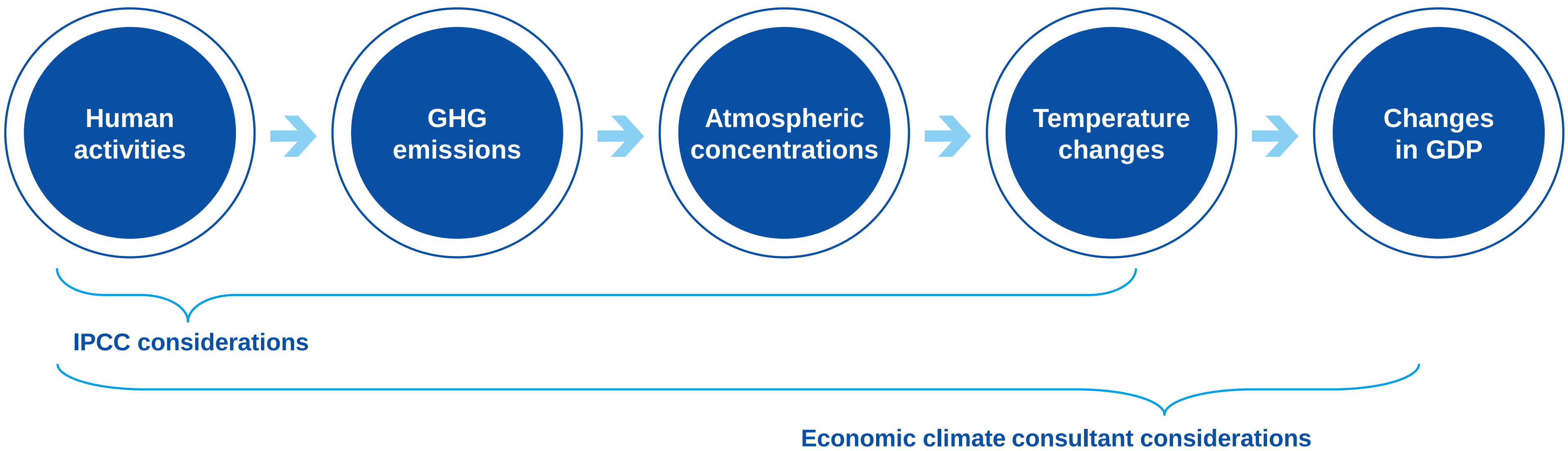
Section 2

# IPCC reports provide scientific colour on climate change

- **The IPCC provides Assessment Reports that map global carbon budgets to associated temperature changes and look at the options for adaptation and mitigation.** The IPCC has published five assessment reports since 1992 (coinciding with the Kyoto protocol) with the last one released in 2014; they come out every 5-6 years.
- The reports use climate models translated into economic impact called 'Integrated Assessment Modelling.' Each report is updated with the latest scientific information. The models, however, are subject to significant uncertainties and measurement errors that can lead to significant revisions of forecasts from one reporting period to another. Economic climate consultants translate the IPCC projections into economic scenarios.

## Degrees of uncertainty in integrated assessment modelling (IAM) methodology for calculating economic damage

Source: Mercer, BBVA GMR



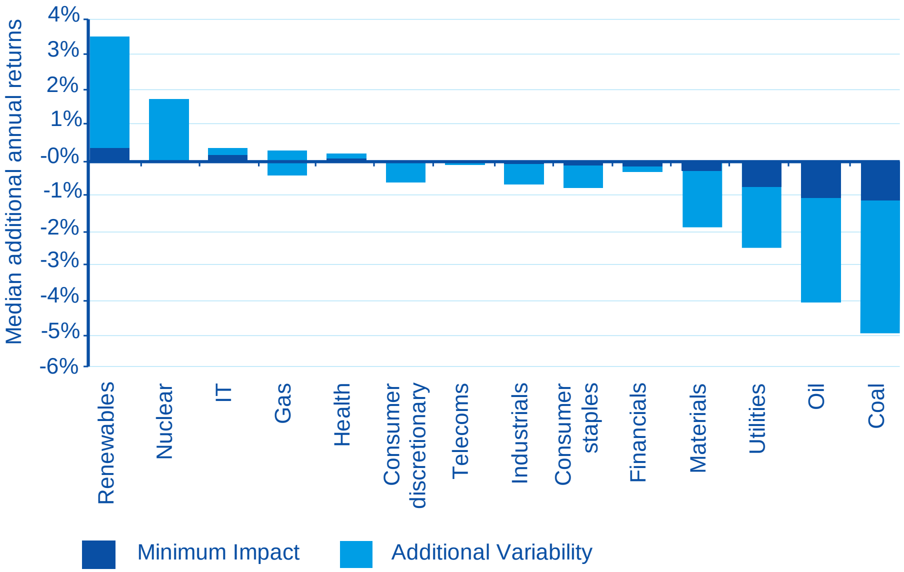
Section 2

# Climate scenario analysis can help determine portfolio return impacts

- **Economic climate consultants can use their own Integrated Assessment Models, leveraging the work of the IPCC to inform projections of financial return risks to various industry sectors and/or asset classes.** Mercer is one such consultant that has provided projections of the impact of climate risk on investment portfolios with a 35-year horizon.
- Such information can be used by long-duration investors, particularly life insurance and pension funds to fine-tune their 'efficient frontier' in terms of portfolio allocation using the tools of modern portfolio theory.

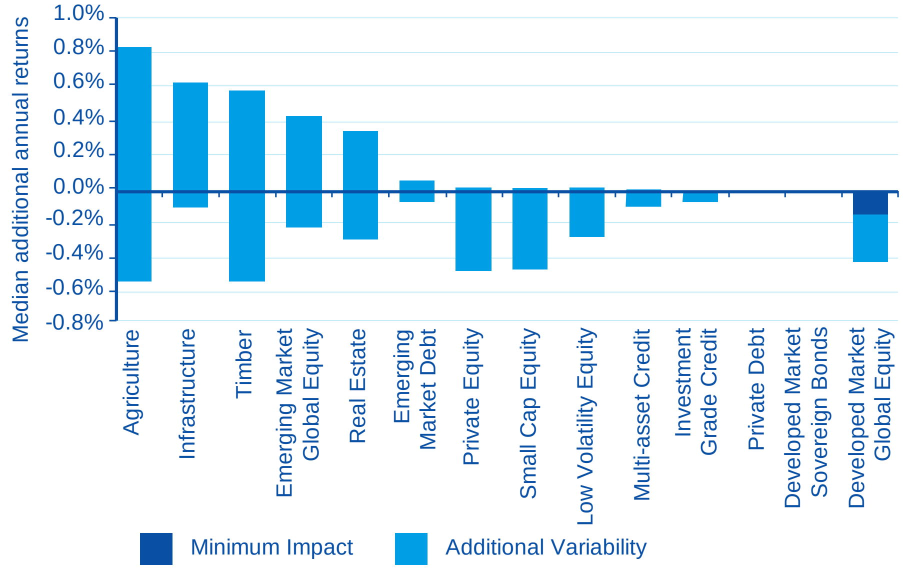
**Climate impact on returns by industry sector** (35 years)

Source: Mercer (2017)




**Climate impact on returns by asset class** (35 years)

Source: Mercer (2017)



Section 2

# Changing emissions profile implies differing risks

## Differing climate pledge scenarios invoke differing climate risks for investors

Source: BBVA GMR, IPCC, IEA

**Green scenario** **Brown scenario**

| Scenario | Rapid Energy Transition | Two-degree | Business as usual |
|---|---|---|---|
| **Corrective transition response** | Radical and swift | Strong, beyond current commitments | Current trajectory, based on efforts already under way |
| **Change in temperature vs. pre-industrial era (2100)** | 1.5°C | 2°C | 4°C |
| **Emission peak** | 2020 | 2020 | 2040 |
| **% fossil fuel in energy mix (2050)** | <40% | <50% | 80% |

**More transition risk**

- Controlled yet aggressive change
- Major short-term impact but reduced long-term impact
- Lowest economic damage

**More physical climate risk**

- Uncontrolled change
- Limited short-term impact but major long-term impact
- Economic damage increases

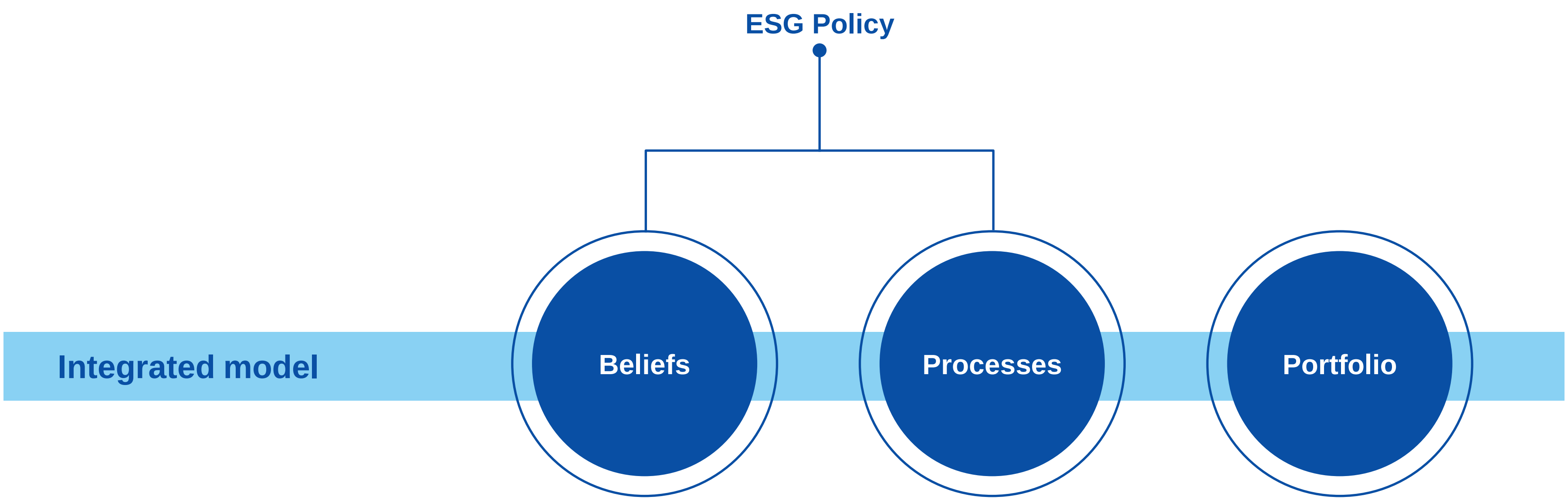
**According to the Carbon Budget in the latest IPCC assessment, commitments made by Paris Agreement signatories would, if fully implemented, lead to a c.2.8 degree rise in temperature above pre-industrial levels. A rapid energy transition would involve policy risk that would likely affect developed economies more, while business as usual would likely have a heavier impact on developing economies.**

Section 2

# ESG policy ultimately determines portfolio construction to mitigate impact of adverse climate

## Creating an ESG policy

Source: Mercer (2017), BBVA GMR




**The portfolio construction (mandate) or investment (constituents) are the most visible elements of an investment portfolio. In reality, it is investors' beliefs (in terms of probability and severity of climate change) and processes (how to invest and/or mitigate climate-affected opportunities) that will ultimately determine an investment portfolio's construction and maximisation.**

Section 2

# Using science-based targets to align investment portfolios with climate trajectory scenarios

- **Investors are increasingly seeking ways not only to determine the carbon footprint of their investment portfolios but to align their portfolios with climate-related pledges.** This tends to be a two-step process whereby the existing carbon footprint is measured and then aligned with a scientific forecast (the IPCC's tends to be the most cited) for climate change.
- Carbon is focused on because it is one of the main greenhouse gases (GHGs) noted in the Kyoto Agreement and IPCC climate scenarios generally associate the probability of climate change scenarios with relevant carbon budgets. It is important to realise that these carbon budgets are not just for carbon but are expressed as 'carbon equivalent;' all GHGs have their global warming potential expressed in terms of that of carbon.

## 1 Measuring emissions profile of investment portfolio

PRI | MontréalPLEDGE

- The 'Montreal Pledge' is overseen by the PRI and allows investors to formalise their commitment to the goals of the Portfolio Decarbonisation Coalition, which encourages investors to measure, disclose and reduce their portfolio carbon footprints.
- Although it is an equity portfolio pledge (120 investors with AuM of USD10trn), the measurement and disclosure of the carbon footprint of portfolios can be applied more broadly, to fixed income portfolios, for example.

## 2 Setting a science-based target

### The pathway to SBTs

Source: Trucost 2017, BBVA GMR

**The impact**
GHG emissions

**Scientific consensus**
IPCC 2º scenario sets global limit

**Science-based target**
Company-level target to align with global trajectory

- Once the emissions profile of an investment portfolio and/or mandate is made, investors need to select their 'climate scenario.'
- Climate scenarios are typically based on IPCC assessments. which determine the carbon budget associated with such scenario. globally.
- Using an 'emissions-based' or 'breakdown-based' assessment, investment portfolios can be constructed according to modern portfolio theory, though controlling for carbon emissions associated with a climate scenario. Such a target is called a 'science-based target'.

Section 2

# Ways to gauge climate impact of investment portfolios

- **There are currently two main ways to compare portfolios' climate impact:** 1) methods based on the carbon emissions (or equivalent) of invested companies; and 2) methods seeking to evaluate a portfolio relative to a macro-level breakdown of investments by technology.

## Emissions-based assessments

### Emission scopes:

- Carbon emissions of investments are typically divided into Scope 1, 2 and 3.*
- Most assessments take direct emissions into account only via Scopes 1 and 2 (respectively, a company's direct emissions and the result of its energy use).

### Scope 3 and 'avoided emissions':

- Indirect Scope 3 emissions arising from the use of an investment's goods/services, transport, distribution or supply chain can be significantly higher than Scopes 1 and 2 in certain sectors (e.g. oil & gas for downstream product usage). Scope 3 is therefore necessary to get a full picture of the emissions profile of a portfolio.
- Induced emissions arising from Scope 3 emissions do not typically take into account any climate benefits, i.e. 'avoided emissions'. Electronics and wind turbine manufacturers may have similar emissions profiles, but the latter clearly has more 'avoided emissions'.

## Breakdown-based assessments

### Macro-level investment breakdown:

- There are macro-level investment breakdowns by energy subsector, such as those by the International Energy Agency, that are compatible with limiting climate impacts.
- The investment portfolio is mapped to the subsector breakdown to determine how close it is to a breakdown compatible with a given climate projection.
- The closer the portfolio is to an idealised low-carbon scenario, the better it is from a climate standpoint.

### Problem of granularity and narrow focus

- This type of assessment cannot necessarily be applied to thematic portfolios or sectoral portfolios, given their inconsistency with macro-investment projections.
- Diversified portfolios are most applicable for this type of assessment, but even then, the approach is based on a single forecast when, in reality, there are a multitude of potential pathways for achieving energy transition objectives.

* https://www.carbontrust.com/resources/faqs/services/scope-3-indirect-carbon-emissions/

Section 2

# Carbon evaluation has benefits other than mitigating policy and/or physical climate risk

- **Carbon footprint analysis can be undertaken at individual or portfolio investment positions, although precise approaches differ markedly from a cost/benefit perspective.** Such cost barriers tend to be used by investment managers as obstacles to detailed analysis, even though such analysis can serve many purposes other than solely to avoid policy or physical climate transition risks.

**Benefits of detailed adoption**

- ✓ Reporting to clients and beneficiaries.
- ✓ Monitoring of asset managers by asset owners, particularly those using portfolio carbon analysis to integrate climate change considerations into their investment goals.
- ✓ Tracking carbon efficiency gains at portfolio level over time.
- ✓ Mandatory and voluntary public disclosure, e.g. Article 173 in France.
- ✓ Carbon risk assessment and management, e.g. to determine the difference in risk exposure between similar funds.

**Barriers to detailed adoption**

- ✗ Lack of ‘materiality’ given limited carbon pricing to date at the international level and uncertainty about its future existence.
- ✗ Issues around quality and availability of data, including difficulty in comparing GHG data.
- ✗ Portfolio carbon footprint service providers rarely offer analysis and interpretation of data that could inform carbon risk assessment and management.
- ✗ Costs associated with hiring a service provider to undertake the carbon footprint analysis can be significant, especially if the near-term gains of using such information are limited.

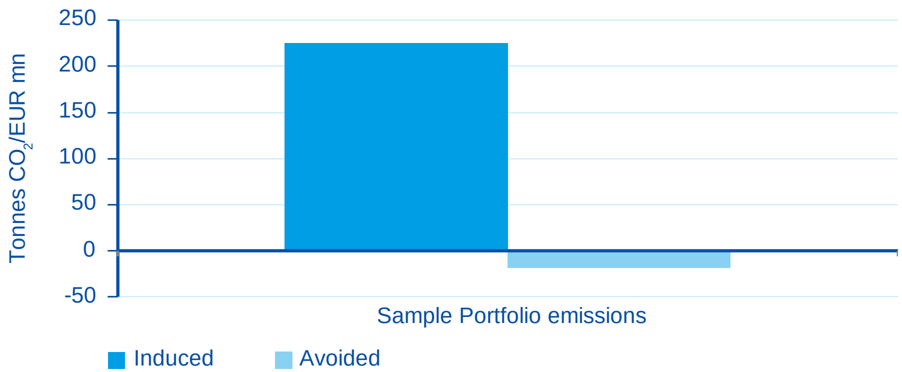
Section 2

# Carbon footprint is best measured by a combination of induced and avoided emissions

- **In our view, the carbon footprint of assets and by extension, of portfolios, is best measured by a combination of negative 'induced' emissions' and positive 'avoided' emissions.** Focusing only on the former leads to incomplete information on a portfolio's climatic contribution.

## Example of induced and avoided emissions

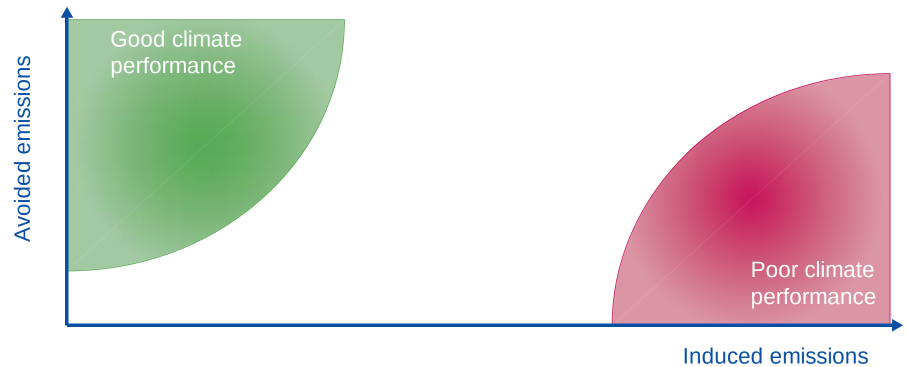
Source: Carbone4




- Induced emissions are derived from the lifecycle of a company's activities (Scopes 1, 2 and 3).
- Avoided emissions are the result of green solutions displacing 'browner' activities and/or energy efficiency. Trains replacing cars is one example.

## Climate performance schematic

Source: Carbone4




- Looking at the climate performance of a portfolio, those with the lowest induced emissions and the highest avoided emissions are best.
- The exercise in determining avoided emissions is analytical and typically done by specialist providers.

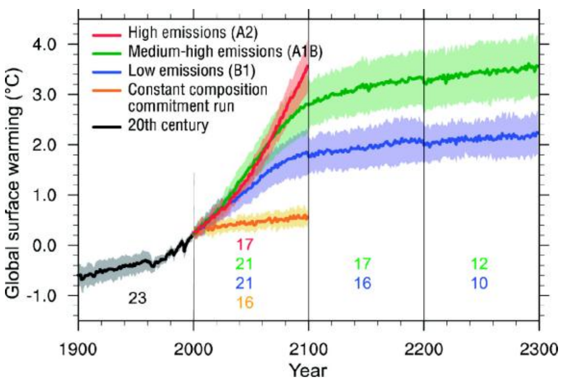
**Avoided emissions are virtual emissions: they would have existed without the company's efforts to decrease them. Induced emissions already account for this fall with reference to a BaU scenario. Thus, subtracting avoided emissions from induced emissions is incorrect as it double-counts these reduced emissions.**

Section 2

# Evaluating portfolio alignment with climate scenarios

- **To calculate holistically an investment portfolio's alignment with certain climate scenarios, three key elements are needed:** 1) an emissions database applied to the underlying companies in the investment portfolio; 2) a climate scenario to reference; and 3) investment projections to ensure that the portfolio target is 'coherent' (for example, it is arguable whether it is desirable for the global economy to be powered entirely by wind energy given that, although it might be environmentally efficient, it won't necessarily have a suitable profile for global energy needs given its intermittent power generation profile).


**1** Carbon emissions database including both 'induced' and 'avoided' emissions over the lifecycle of a company's products (Scopes 1, 2 and 3). This database could be project-linked (need to map projects to company) or company-specific.




Source: UNFCC

**2** Climate scenarios link carbon-equivalent emissions to likely changes in the earth's climate via changes in the global surface temperature. The globally accepted authority on this is the IPCC, which releases intermittent 'assessments' that refine carbon budgets and global surface temperature changes.

iea International Energy Agency

**3** Global energy requirements and usage are the domain of the International Energy Agency (IEA). The IEA also produces investment projections in relation to energy infrastructure to meet global energy needs. This projection can be used to assess the coherence of energy-related investment with global climate scenarios.

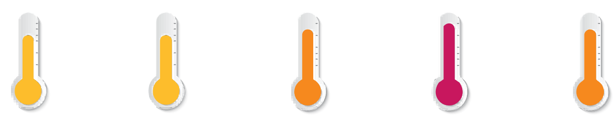
Section 2

# Ascertaining the emissions profile of index investments

- **Many investment managers either operate passive tracker funds, or at least benchmark their funds to stock or bond indices.** Work by the consultant Carbone4 has provided helpful insights into the carbon profile of several closely followed equity and fixed income indices. Indices that are made up heavily of representatives of oil and gas or utilities without significant renewable energy sourcing tend to have the greatest carbon footprints and are associated with significant global surface temperature warming scenarios, as per the IPCC assessment.
- Interestingly, the index evaluations show that all indices are associated with global temperature increases of more than the Paris Agreement commitments, necessitating the likely need for policy action and/or company asset rotation to meet such targets. Such rotations and/or policy actions can be investible opportunities for the former and risk management considerations for the latter.

## Evaluating the emission profile of common indices

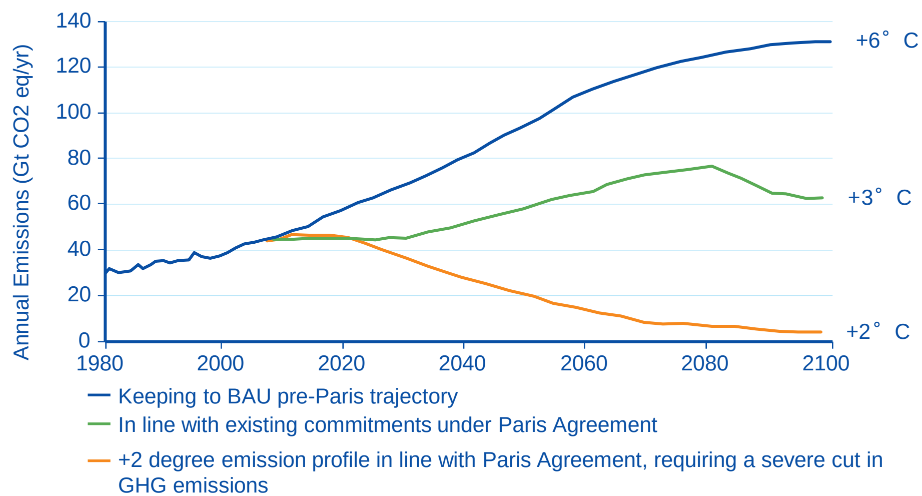
Source: Carbone4



| | S&P500 | MSCI World | MSCI Europe | CAC 40 | Barclays Euro Aggregate Corporates |
|---|---|---|---|---|---|
| | 3.7°C | 4.0°C | 4.7°C | 5.5°C | 4.4°C |
| Induced ($tCO_2$/EUR mn) | 98.3 | 146.5 | 216.0 | 272.5 | 184.3 |
| Avoided ($tCO_2$/EUR mn) | -11.4 | -14.9 | -16.0 | -16.2 | -13.7 |

## Environmental coherence between investment profile and climate scenarios

Source: IPCC, BBVA GMR



Section 2

# Portfolio decarbonisation

- **Reducing the carbon footprint of investment portfolios as a means to mitigate carbon risk exposure.** Once an investor has undertaken carbon analysis and assessed the carbon risk exposure of his or her portfolio, there are ways potentially to reduce this exposure.
- Such approaches typically fall into two categories:

**1 Geographical approaches** → These seek to shift investment to jurisdictions where regulation of carbon emissions is less advanced or less likely to emerge. These approaches only reduce the regulatory and, by extension, policy risk of high carbon sectors but may increase the reputational drivers of carbon risk exposure, not least because they do nothing for climate goals.

**2 Quantitative approaches** → These seek to cut carbon risk exposure by reducing carbon footprints of single investment positions, which, in aggregate, has a net effect on the portfolio carbon footprint. This is typically is defined as a reduction in either: 1) carbon emissions per EUR1mn invested; or 2) absolute level of carbon emissions annually.

### Three key quantitative approaches for investors to reduce carbon risk exposure

- Invest in assets belonging to less carbon-intensive sectors relative to benchmark **(asset allocation)**
- Select assets with a lower carbon footprint ***within*** each sector relative to benchmark **(security selection)** or select companies with particularly good decarbonisation strategies and ambitious targets, even if they may currently be relatively carbon-inefficient.
- Engage with carbon-intensive companies to encourage carbon efficiency gains over time **(shareholder engagement).**

# Index

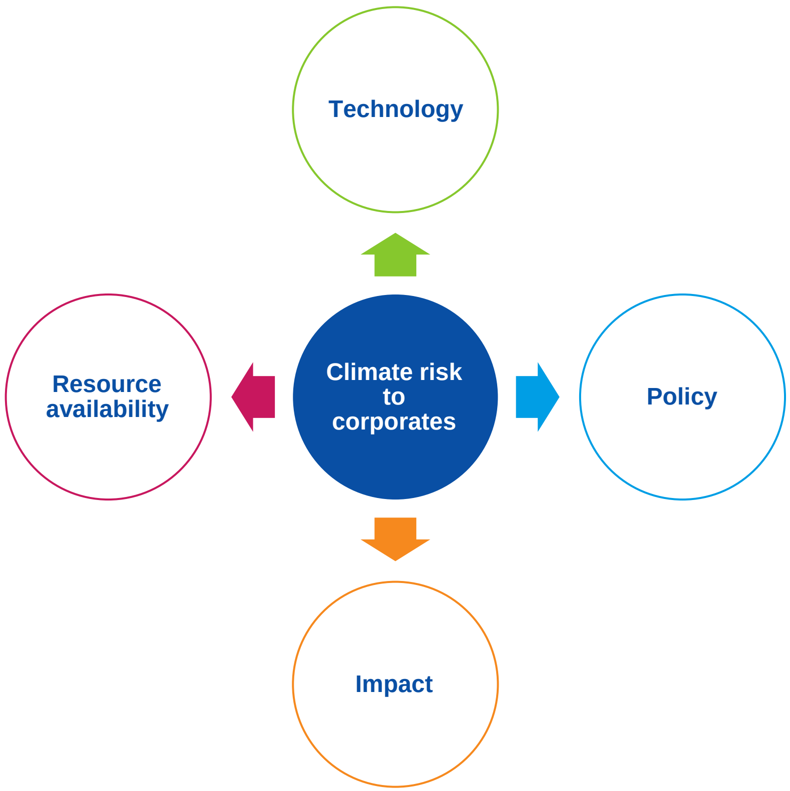


SUSTAINABLE DEVELOPMENT GOALS

Section 3

# Using a 'TRIPs' framework to isolate risks of climate change in corporate business models

## TRIPs Framework




- **Technology (T):** rate of progress and investment in the development of technology to support a low-carbon economy.
- **Resource availability (R):** impact on investments of **chronic** weather patterns (including changes in temperature and precipitation patterns) and related physical changes.
- **Impact (I):** physical impact on investments of acute weather incidence/severity, i.e. catastrophic events like hurricanes.
- **Policy (P):** international, national and sub-national climate-related targets including mandates, legislation and associated regulations designed to reduce the risk of further man-made (anthropogenic) climate change

- Climate risk is most closely related to SDG 13 (Climate Action), though there is crossover with other SDGs.
- Security selection and evaluation will need, in time, to take into consideration the risk of adverse climate change to corporate activities.
- Using the TRIPs framework presented here provides a structured macro view in which to ascertain the risks to corporates and industrial sectors.
- For the avoidance of doubt, this framework can also be used for portfolio selection.

Section 3

# TRIPs framework: Technology

## Trip

- **Technology as a factor primarily refers to mitigation efforts to transform energy production, transmission, and use to reduce the world's carbon and its energy intensity.** It also refers to other technological developments for mitigation (e.g. land use efficiency) and adaptation (e.g. disaster risk management and increasing resilience of infrastructure).
- The factor can best be interpreted as a measure of future private-sector, low-carbon investment flows under various climate scenarios, for which a higher technology value indicates a higher level of investment. It is this 'financing flow' that the Paris Agreement seeks to facilitate.
- Companies that seek to access such financing flows are, in the short term, mitigating any adverse policy risk; in the long term, they are mitigating actual physical risks associated with adverse climate change.

### Key investment flow metrics for technology

1. Policy (e.g. carbon pricing, low-carbon investment mandates, efficiency standards)
2. Availability of cost-effective, low carbon alternatives in the event of governmental subsidies and/or carbon pricing
3. Private sector demand, e.g. business strategic targets to become 100% renewable and/or focusing on green financing
4. Investor targets related to decarbonisation of portfolios such as divestment of coal and clean tech commitments

Section 3

# TRIPs framework: Resource availability

**tRip**

- **Resource availability refers to how changes in the physical environment might affect investments and/or businesses reliant on the use of resources.** Such resources, through inter-relationships with climate change, could be at risk of becoming scarcer or in some instances, more abundant and can include clean air, water natural materials and agricultural products.
- The investment impact of adverse climate change on natural and material resource distribution can be significant given chronic shifts in long-term weather patterns.

**Chronic weather pattern changes can have positive or negative impacts, including:**

1. Higher average annual temperatures resulting in increases or decreases in crop yields.
2. Lower average annual precipitation, including shifts in the timing/duration of rainy seasons, resulting in reduced crop yields, livestock death and water shortages, which can have negative effects on the energy and mining industries.

Section 3
# TRIPs framework: Impact

trIp

- **This factor is related to the investment impact of climate change on the physical environment caused predominantly by shifts in extreme weather incidence and/or severity.** According to scientists, should the earth's global mean surface temperature rise by more than 2 degrees above the pre-industrial average, then the global climatic system will adversely affect the climate, with a significant impact on global economic systems.
- The reality is that such impacts remain on the horizon, even though there is gathering momentum, particularly at the sovereign level, to mitigate such changes and ensure environmental sustainability on an inter-generational fairness basis. The areas most exposed to such impacts include financial services, agriculture from a sector perspective, and developing economies more broadly from an adaptation perspective.

**Examples of physical impacts that can be of notable risk to corporates include:**

1 Increased property damage and business interruption as a result of more volatile extreme flooding.

2 Coastal flooding and potential shifts in the distribution of hurricane activity toward less frequent but more severe weather events, although this shift has yet to be proven scientifically.

3 Wildfire, which causes complex damage to various industries and has a direct impact on forestry, residential real estate and rural municipalities.

Section 3

# TRIPs framework: Policy

**triP**

- **Policy is related to the coordinated ambition of governments to adopt and adhere to policies and regulations to reduce GHG emissions.** In the next decade, this is likely to be the biggest risk driver for corporate credit profiles given their capacity to disrupt the economics of certain industries and players.

## Climate policy goals

- **Reduction targets**: the goal to reduce GHG emissions by a given amount by a set date.
- **Fiscal policy**: carbon pricing and subsidies.
- **Energy supply**: examples include restrictions on coal, renewable energy mandates, fuel switch and carbon capture and storage systems.
- **Energy efficiency**: building codes, appliance standards, fuel-efficiency standards.
- **Land use**: reducing emissions from land degradation, such as deforestation.
- **Methane reduction:** reduction of short-lived climate pollutants, particularly from agriculture and energy.

## Likely climate policy outputs

- Explicit carbon-pricing mechanisms, e.g. carbon tax/emissions trading systems.
- Measures that put an implicit price on carbon, e.g. energy taxes or ‘soft’ industry-specific regulations.
- Targeted support for research and development, including clean tech subsidies.
- Revision of legacy policies that increase emissions, such as sectoral subsidies for carbon-intensive industry.

**Impact of climate policy on corporates can be classified into two categories depending on whether they focus on the supply or demand side**

1. **Supply side:** policies that encourage substitution of higher-emission technologies (fossil fuel-intensive sectors) with low-emission technologies (i.e. renewable energy).

2. **Demand side:** policies that discourage consumption of products that generate emissions, either via price increases on such products and/or non-price-induced decreases in demand for such products, e.g. labels showing the embedded GHG emissions of various products.

Section 3

# Bringing the TRIPs framework to the sector level (1)

## Equity sector corporate impact: Climate risk

- **The consulting firm Mercer conducted an analysis using a 'TRIPs' framework approach to various equity sectors and their sensitivity to each of the factors.** Energy and Utilities have the standout risks to adverse climate change, while Materials and Industrials have the most upside potential from the implementation of technology.

### Sensitivity to the climate change risk factors - Industry and sector level[1]

1. Based on MSCI Global Industry Classification System.
Source: Mercer

| EQUITY SECTOR | T | R | I | P |
|---|---|---|---|---|
| **ENERGY** | -0.25 | -0.75 | -0.75 | -0.75 |
| Oil | -0.50 | -0.75 | -0.75 | -0.75 |
| Gas | <0.25 | -0.50 | -0.75 | <0.25 |
| Coal | -0.50 | -0.75 | -0.75 | -1.00 |
| Renewables | 0.50 | -0.25 | -0.25 | 1.00 |
| Nuclear | 0.50 | -0.75 | -0.25 | 0.50 |
| **UTILITIES** | -0.25 | -0.75 | -0.50 | -0.50 |
| Electric | -0.50 | -0.75 | -0.50 | -1.00 |
| Gas | -0.25 | -0.75 | -0.25 | -0.50 |
| Multi | -0.25 | -0.75 | -0.50 | -0.75 |
| Water | -0.25 | -0.50 | -0.25 | -0.75 |
| **MATERIALS** | <0.25 | -0.75 | -0.25 | -0.50 |
| Metals and mining | <0.25 | -0.75 | -0.25 | -0.75 |
| **INDUSTRIALS** | <0.25 | >-0.25 | -0.50 | -0.25 |
| Transport and infrastructure | <0.25 | >-0.25 | -0.75 | <0.25 |
| **CONSUMER DISCRETIONARY** | 0.00 | 0.00 | 0.00 | >-0.25 |
| **CONSUMER STAPLES** | 0.00 | -0.25 | 0.00 | >-0.25 |
| **HEALTH** | 0.00 | <0.25 | <0.25 | 0.00 |
| **FINANCIALS** | 0.00 | >-0.25 | -0.50 | 0.00 |
| **IT** | <0.25 | 0.00 | 0.00 | 0.00 |
| **TELECOMMUNICATIONS** | 0.00 | 0.00 | >-0.25 | 0.00 |

Negative — Positive

Section 3

# Bringing the TRIPs framework to a sectoral level (2)

## Asset class corporate impact: Climate risk

- **The same TRIPS framework when applied at a global asset class level also gives interesting insights.** Agriculture, extractive industries, real estate and emerging global equities would appear to be at the highest risk of business impact due to climate risk.

## Sensitivity to the climate change risk factors - Asset class level

Source: Mercer

| ASSET CLASS | T | R | I | P |
|---|---|---|---|---|
| Developed Market Global Equity | <0.25 | >-0.25 | >-0.25 | >-0.25 |
| Emerging Market Global Equity | <0.25 | -0.25 | -0.50 | <0.25 |
| Low Volatility Equity | 0.00 | >-0.25 | >-0.25 | >-0.25 |
| Small Cap Equity | <0.25 | >-0.25 | >-0.25 | >-0.25 |
| Developed Market Sovereign Bonds | 0.00 | 0.00 | 0.00 | 0.00 |
| Investment Grade Credit | <0.25 | >-0.25 | >-0.25 | >-0.25 |
| Multi-asset Credit | 0.00 | 0.00 | >-0.25 | 0.00 |
| Emerging Market Debt | 0.00 | >-0.25 | -0.25 | <0.25 |
| High Yield Debt | 0.00 | >-0.25 | -0.25 | >-0.25 |
| Private Debt | 0.00 | 0.00 | 0.00 | 0.00 |
| Global Real Estate | <0.25 | 0.00 | -0.75 | <0.25 |
| Private Equity | <0.25 | >-0.25 | -0.25 | >-0.25 |
| Infrastructure | 0.25 | >-0.25 | -0.50 | <0.25 |
| Timber | <0.25 | -0.75 | -0.50 | 0.25 |
| Agriculture | 0.25 | -1.00 | -0.50 | 0.25 |
| Hedge Funds | 0.00 | 0.00 | 0.00 | 0.00 |

Negative Positive

Section 3

# Calculating climate impact on financial returns

## Using climate scenarios to assess the impact on financial returns

- **To use the TRIPs framework on individual financial instruments, it is important to calculate: 1) a climate pathway; 2) the sensitivity of the asset value backing such financial instruments in such a scenario;** and **3) the impact on price/return of such a change in asset value.** This is easier said than done and is certainly in the realm of specialist consultants who can map science-based targets with investment performance. Nonetheless, a schematic of the process is given below:

### Calculating the climate impact on returns

Source: Mercer, BBVA GMR

| Scenario pathways | × | Asset sensitivity | = | Investment impacts |
|---|---|---|---|---|
| • How will each TRIP factor change over time for each scenario?<br>• A quantitative pathway is developed for each risk factor and scenario. | | • How sensitive is each sector and each asset class to each TRIP factor?<br>• Risk factor sensitivity assigned, as either positive or negative, and a relative magnitude. | | • How are different sectors and asset classes impacted over different time periods?<br>• What asset allocation implications should investors be most aware of? |

Section 3

# At the company level: SDG alignment and the creation of business value

- **In our view, there is value in looking at corporate investment opportunities and their degree of alignment with SDGs.** Poor SDG alignment can be linked to reputation, and operational, regulatory or physical risks, while revenue exposure to sectors and/or products aligned with SDG solutions can be linked to future growth opportunities.
- Applying an SDG lens to the evaluation of corporates can provide a broader, more long-term perspective on potential business and social value, particularly where such value goes beyond the immediate P&L. Furthermore, companies, by providing enhanced disclosure, can articulate to market participants how their investments are providing incremental value, including positive impacts on SDGs.

## SDG total value creation

Source: Trucost, BBVA GMR.

**What action is the company taking to align with SDGs?**

Enterprise arms creating business value through SDG alignment

**Operations and supply chain**

**Products and services**

**Philanthropy and CSR**

**Typical corporate sustainability journey**

Assess material issues and sector-specific metrics → Measure & disclose regional and context-specific performance → Optimise business strategies, programmes & projects → Set targets and track progress on financial, environmental and social value-creation

Total value-creation for the private sector through SDG alignment

**Environmental Value**
- Climate stability
- Biodiversity conservation
- Improved water systems
- Sustainable resource use

**Financial value**
- **Lower cost of capital**
  - Reduced operating expenses
  - Improved credit rating
  - Improved employee retention
- **Avoided risk**
  - Raw material sourcing; operational vulnerability
  - Brand reputation; regulatory pressure
- **Growth**
  - Product or service innovation
  - Enter new markets

**Social value**
- Strengthened communities
- More equitable and stable global economy
- Access to basic needs
- Improved public services
- More educated and empowered communities

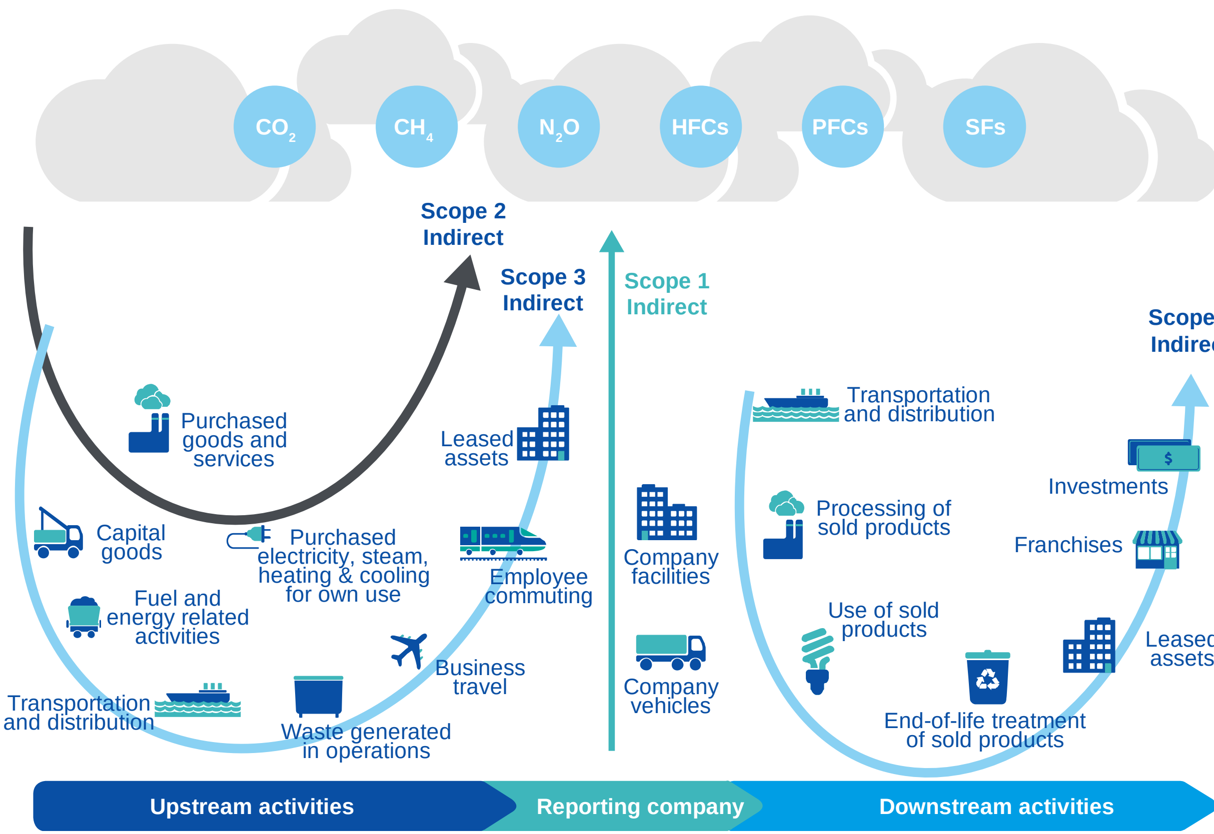
Section 3

# Measuring GHG emissions is the first step to determining likelihood of policy-driven climate risk

- **Although climate change has the capability to physically affect all sectors to some degree, we believe that those that are exposed to 'policy risk' are most at risk in the next 10 years.** There are many possible policy actions that governments can take to facilitate a transition to a low-carbon economy, but the risk to a company of an adverse outcome from such policy actions depends on the GHG emissions of its activities.
- The GHG Protocol breaks down corporate emissions into three scopes that, ideally, should be taken into account by investors in appraising the risk of such corporate profiles to climate policy risks.

## The 3 scopes of corporate GHG emissions

Source: The Greenhouse Gas Protocol, BBVA GMR



Section 3

# Complex methods are used to calculate carbon footprints, but the basic premise remains the same

- **The basic premise of 'carbon counting' for company activities is typically to attribute to a financial asset holder a share of the company's underlying footprint, i.e. x $tCO_2eq$ per EUR1mn invested.** That said, the most advanced methods seek to attribute such footprints to equity holders only as they relate to company turnover.
- Where there are investors other than equity holders (e.g. fixed income instruments), methods typically focus on share of the enterprise value (as opposed to turnover of investment) held in the investor's portfolio and quantify that. This requires two steps:

**Quantitative indicator for carbon footprint of ANY investment**

1. Calculation of the company's carbon intensity expressed in $tCO_2$ eq/euro of enterprise value. This should be derived by mapping the company activities to GHG profile databases maintained by credible third parties (such as IPCC/IEA), with care taken to separate out avoided from reduced induced emissions.

Individually, this is the carbon footprint of individual securities

2. Multiplication by the investors portfolio's exposure to the company, in EUR mn:

$$\frac{\text{Reprocessed } (tCO_2eq)}{\text{Enterprise Value (EUR mn)}} * \text{Portfolio exposure (EUR mn)}$$

$$= \text{Emission to add } (tCO_2eq)$$

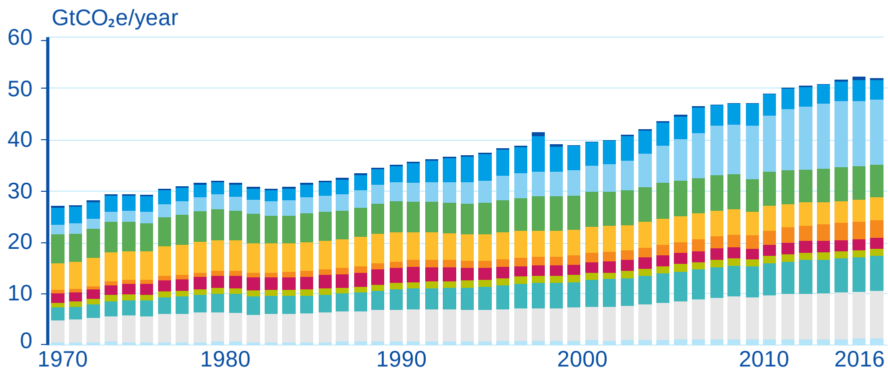
Summing up the portfolio exposures in terms of $tCO_2eq$ across the entire investment portfolio gives an indication of the entire investment footprint

Section 3

# GHG emissions remain on a solid upward trajectory, despite recent plateau

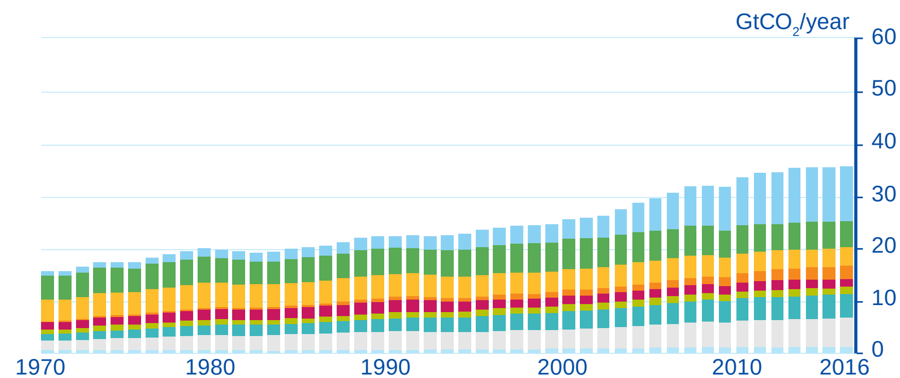
## Global greenhouse gas emissions

Source: EC's EDGAR v4.3.2, BBVA GMR




## Global $CO_2$ emissions

Source: EC's EDGAR v4.3.2, BBVA GMR




Land-use change emissions (net $CO_2$) | China | EU-28 | Russian Federation | Other G20 countries | International transport
Land-use change fires ($CH_4$, $N_2O$) | USA | India | Japan | Other countries

- Global greenhouse gas emissions for top six emitting countries and regions (excluding land use, land-use change and forestry), international transport emissions, and land use, land-use change and forestry emissions.

- Global carbon dioxide emissions per region from fossil fuel use, cement production and other processes, and from international transport.

Note: The greenhouse gas totals are expressed in terms of billions of tonnes of global annual $CO_2$ equivalent emissions ($GtCO_2e$/year). $CO_2$ equivalent is calculated using the Global Warming Potentials (GWP-100) metric of UNFCCC as report in the IPCC Fifth Assessment Report.

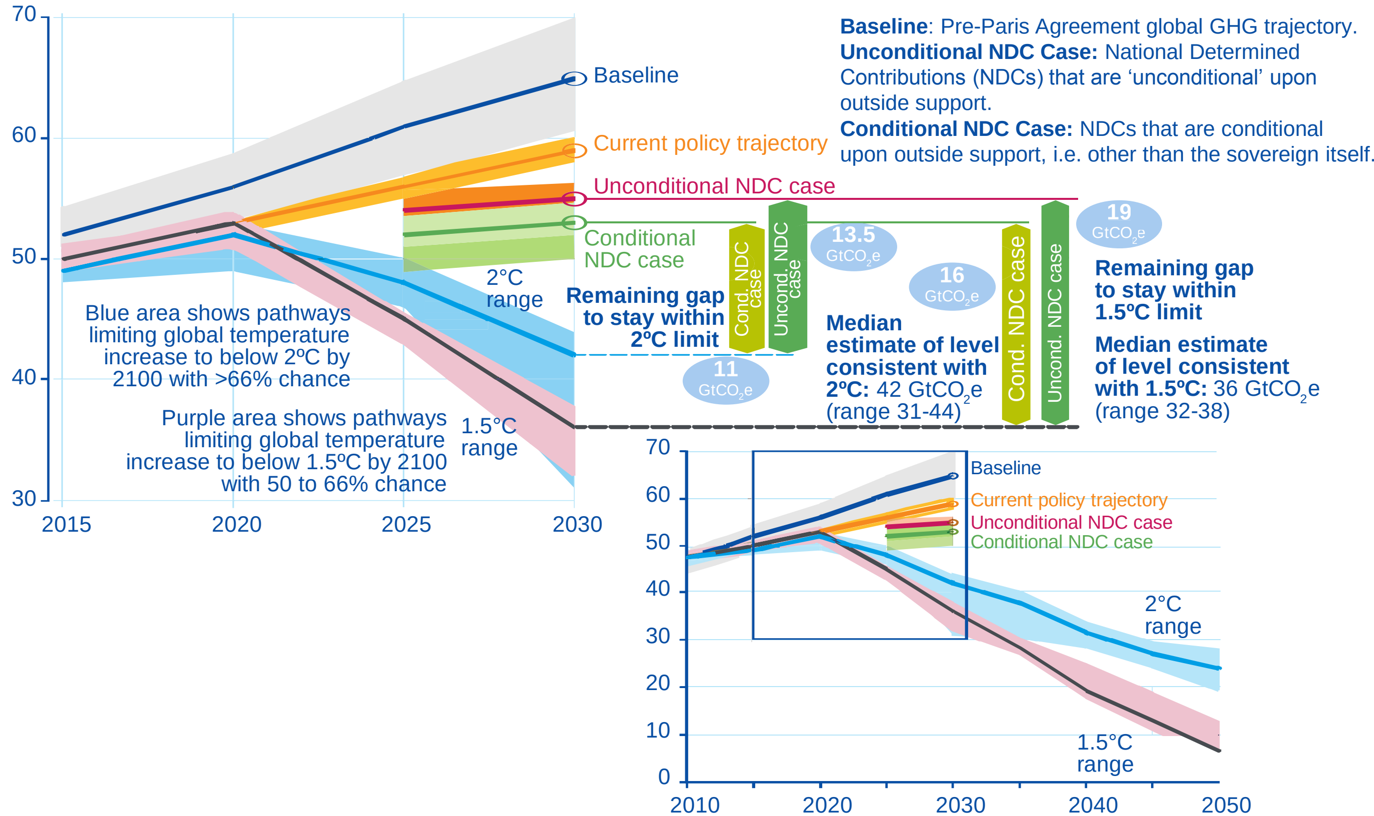
Section 3

# UNEP-calculated 'emissions gap' will likely lead to increasing policy-driven 'transition risk'

- **Despite the success of the Paris Agreement in agreeing to limit emission levels to between 1.5 and 2 degrees, the national determined contribution of each sovereign still produce emissions levels too high to avoid a 2 degree scenario.** As such, in the next decade, sovereigns will need to become more aggressive, with private sector solutions in the vanguard if the 'emissions gap' is to be surmounted.
- As can be seen on the 'carbon budget' calculation using the UNEMP Emissions Gap Report on the right, such **policy driven 'transition risk' could be a real driver of investment returns/risks at the corporate level over the next decade.**

## Global GHG under different scenarios and the emissions gap in 2030 ($GtCO_2e$)

Source: UNEP Emissions Gap Report, 2017, BBVA GMR




Note: the emissions range for 1.5° C is smaller than for 2° C, as a smaller number of studies for 1.5° C are available. For current policy, the minimum–maximum across all assessed studies are provided.

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