



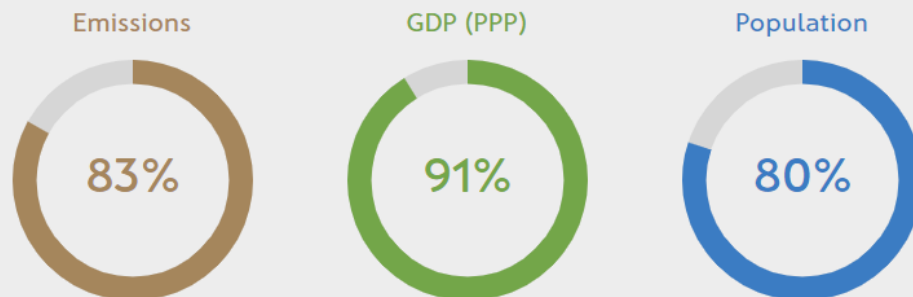
Helena Viñes

Banco de España, 3 marzo 2023

The quest for Net Zero: Integrity Matters

Net Zero Stocktake 2022

GLOBAL NET ZERO COVERAGE



Country-level coverage only. We do not include sub-national net zero targets in countries without a target.

NET ZERO NUMBERS

Countries	Regions
138	116
Cities	Companies
241	795

Out of 198 countries, 713 regions, 1177 cities and 2001 companies.

A litany of broken climate promises

“The jury has reached a verdict. And it is damning. This report (IPCC) is a litany of broken climate promises. It is a file of shame, cataloguing the empty pledges that put us firmly on track towards an unlivable world.....We are on a pathway to global warming of more than double the 1.5-degree limit agreed in Paris. Some government and business leaders are saying one thing –but doing another. Simply put, they are lying. And the results will be catastrophic.”

António Guterres, Secretary General of the United Nations

UN Secretary General's mandate

Current standards and definitions for setting net-zero targets.

Credibility criteria used to assess the objectives, measurement and reporting of net-zero pledges.

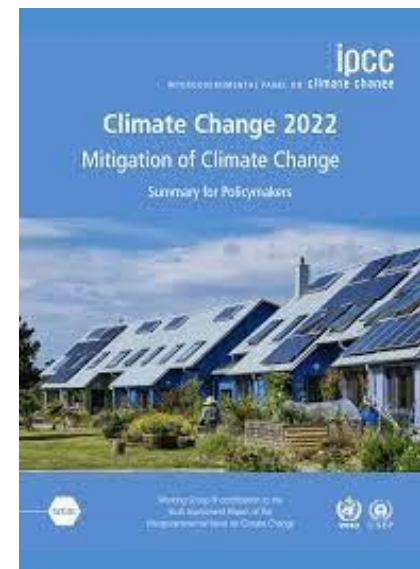
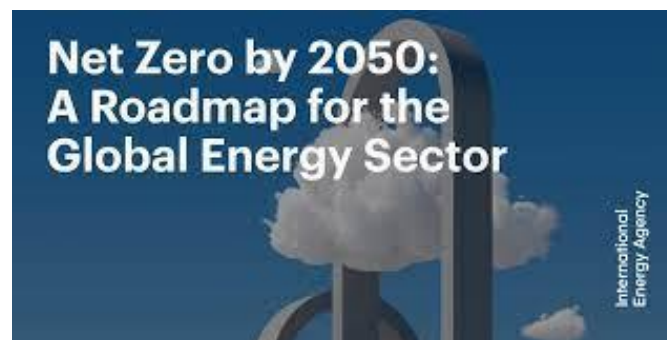
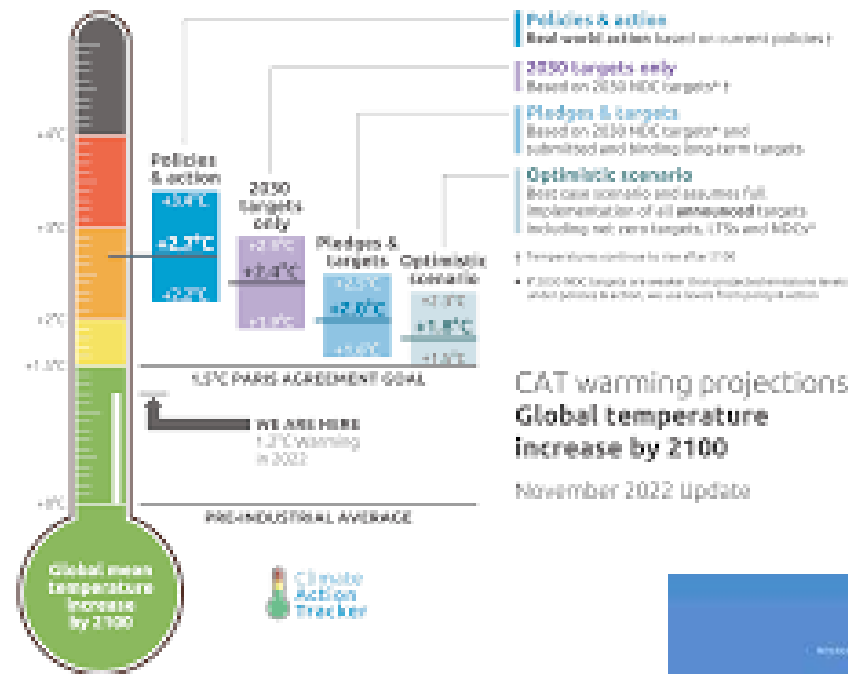
Processes for verifying progress towards net-zero commitments and decarbonization plans.

And a roadmap to translate standards and criteria into international and national regulations.



1.5°C is still in reach

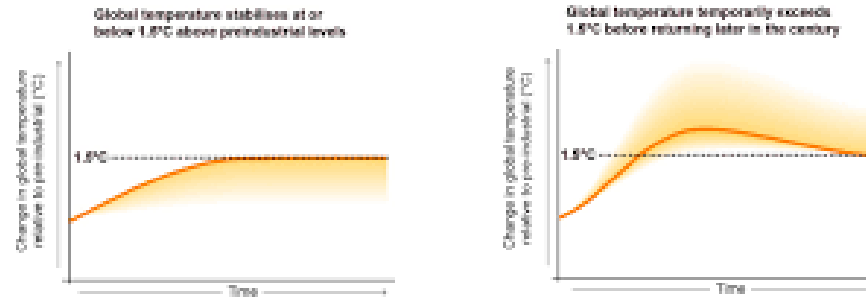
Pledges ought to be in line with IPCC's net zero GHG emissions modelled pathways that limit global warming to 1.5°C with no or limited overshoot



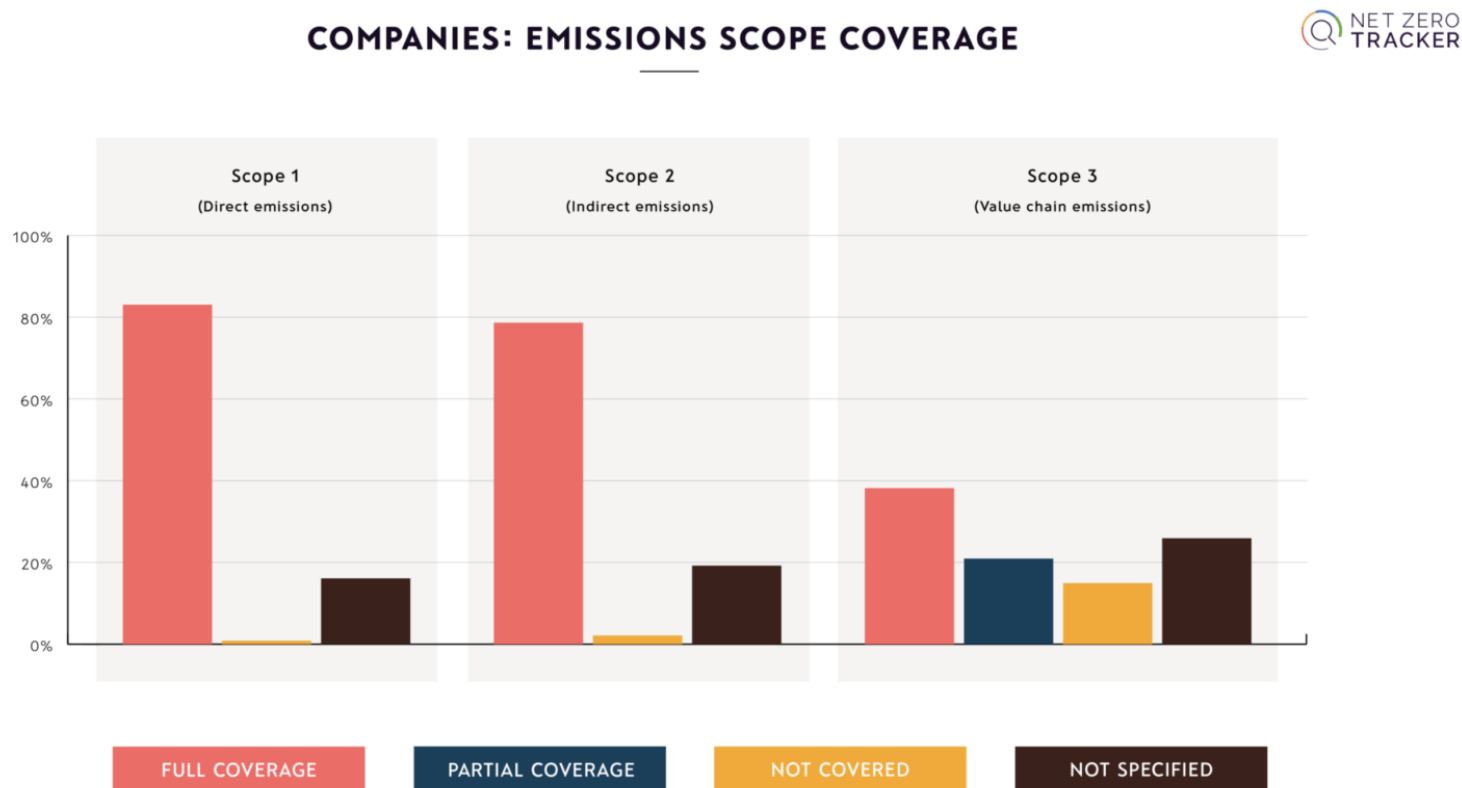
Pledges ought to be in line with IPCC's net zero GHG emissions modelled pathways that limit global warming to 1.5C with no or limited overshoot

FAQ2.1: Conceptual pathways that limit global warming to 1.5°C

Two main pathways illustrate different interpretations for limiting global warming to 1.5°C. The consequences will be different depending on the pathway.



All emissions across the value chain, all operations, all absolute emissions



Detailed and business- aligned transition plans together with verified annual progress reporting



COMPANIES: PLANNING DOCUMENT

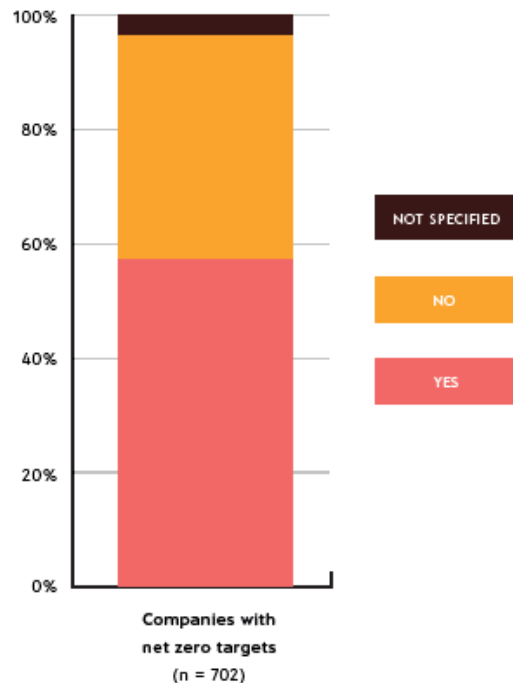
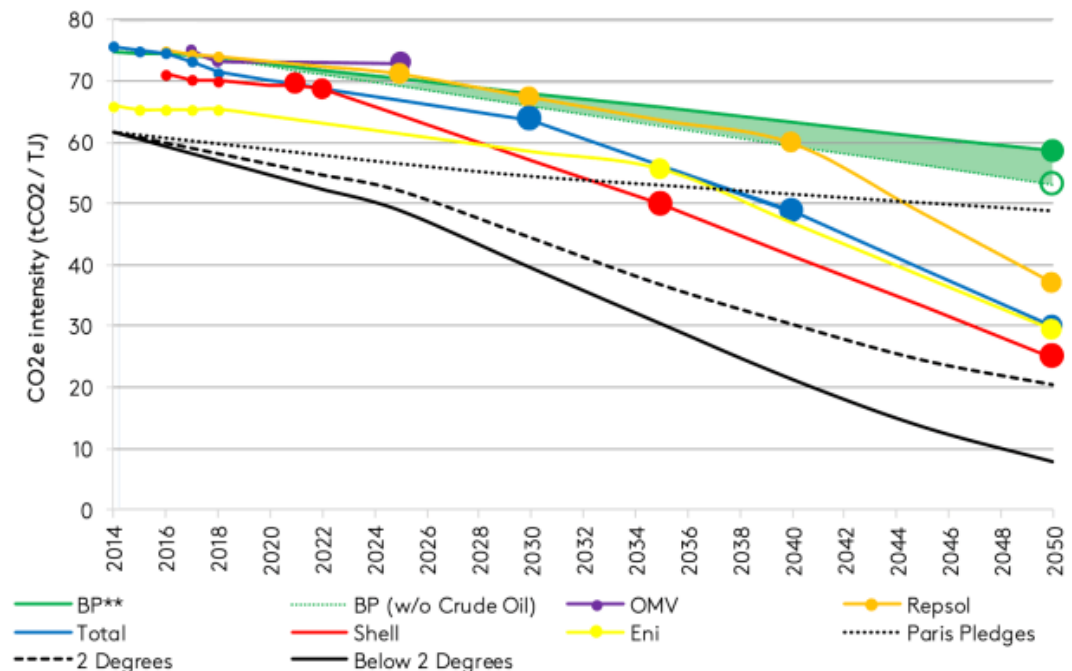
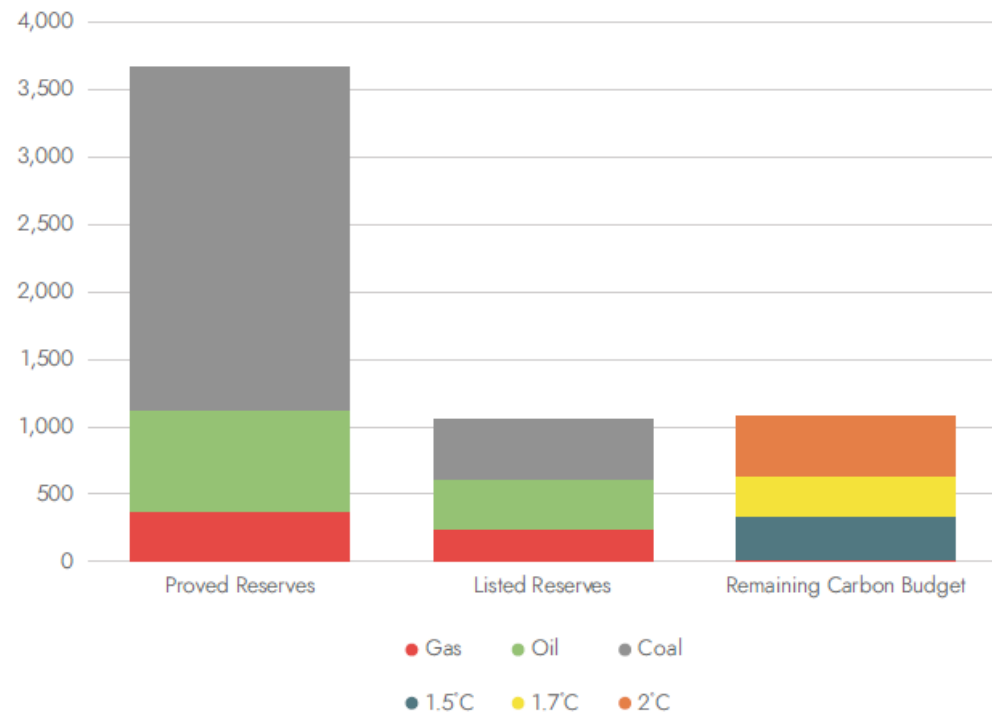


Exhibit ES1. Carbon Performance in European Integrated oil and gas*



The carbon potential of discovered fossil fuels exceeds the remaining budget



Source: BP, FFI Solutions, Rystad Energy, IPCC, Global Carbon Project and Carbon Tracker analysis

Fossil fuels and stranded assets



Just transition




Just
Equitable
Inclusive
Transition






Do No Significant Harm to other environmental objectives: The Taxonomy as the bottom-up proof



Mitigación al cambio climático
Adaptación al cambio climático
Uso sostenible y protección de los recursos hídricos y marinos
Transición hacia una economía circular
Prevención y control de la contaminación
Protección y recuperación de la biodiversidad y los ecosistemas

	Company A		
			
Taxonomy Turnover	Not Aligned	Not Aligned	Aligned 10%
Taxonomy Capex	Aligned 30%	Aligned 30%	

	260g CO ₂ /kWh		
			
Carbon Intensity	200g CO ₂ /kWh	300g CO ₂ /kWh	80g CO ₂ /kWh
Turnover	100M	400M	50M

The non-negotiables

1. Pledges ought to be in line with IPCC's net zero GHG emissions modelled pathways that limit global warming to 1.5C with no or limited overshoot (ARS 6).
2. Setting short and medium-term targets for absolute emissions, not only relative, and include all emissions throughout the entire value chain.
3. Comprehensive transition plans and verified detailed annual progress reporting are the base for a credible pledge.
4. Pledges must include the phasing out of fossil fuels in line with 1.5 pathway and voluntary credits cannot count towards interim targets.
5. We cannot ignore the social impact of climate change and of the transition, nor can we ignore the interlinkages with other environmental objectives (such as biodiversity).

Pathway to Action



United Nations
Climate Change

COP27
SHARM EL-SHEIKH
EGYPT 2022



Thank you for your interest

Ten Recommendations

1. Announcing a Net Zero Pledge
2. Setting Net Zero Targets
3. Using Voluntary Credits
4. Creating a Transition Plan
5. Phasing out of Fossil Fuels and Scaling Up Renewable Energy
6. Aligning Lobbying and Advocacy
7. People and Nature in the Just Transition
8. Increasing Transparency and Accountability
9. Investing in Just Transitions
10. Accelerating the Road to Regulation

Integrity Matters



Net zero para asset managers

03/03/2023

Antonio Santoro – Head of Southern Europe, PRI.

E:antonio.santoro@unpri.org

Green Fridays at Banco de España

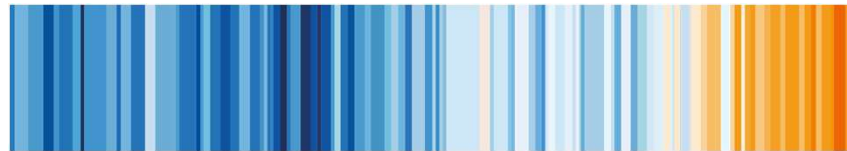


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Definir el tema

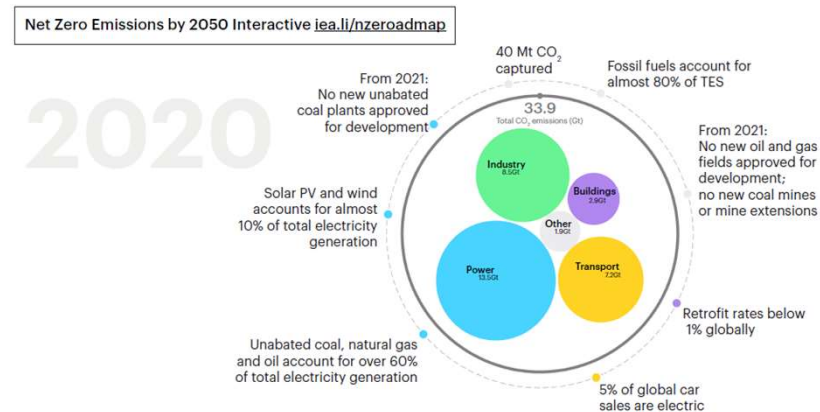
La Tierra se está calentando más rápido que en cualquier otro momento de la historia reciente. Según los patrones actuales de emisión de gases de efecto invernadero, el calentamiento global podría alcanzar 1,5 ° C por encima de los niveles preindustriales para 2040.

Global temperature change



El IPCC, el organismo científico de las Naciones Unidas relacionado con el cambio climático, define el cero neto como:

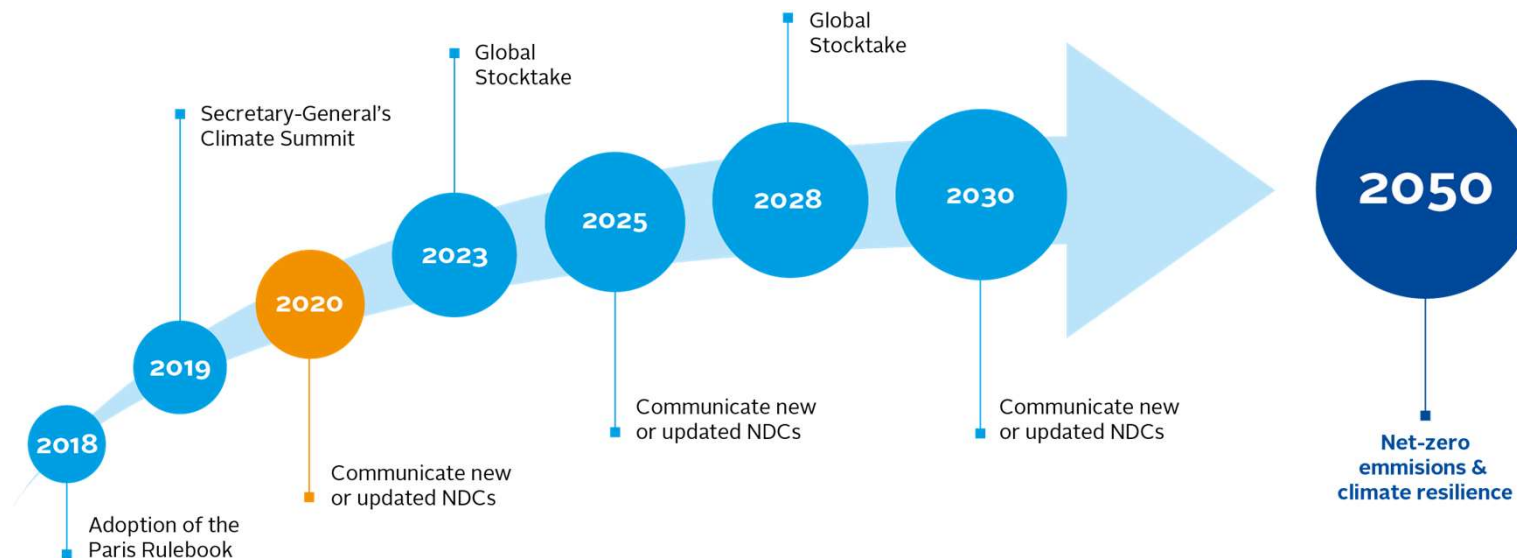
“Cuando las emisiones antropogénicas de CO₂ se equilibran globalmente con la absorción antropogénica de CO₂ durante un período específico.” ([Source](#))



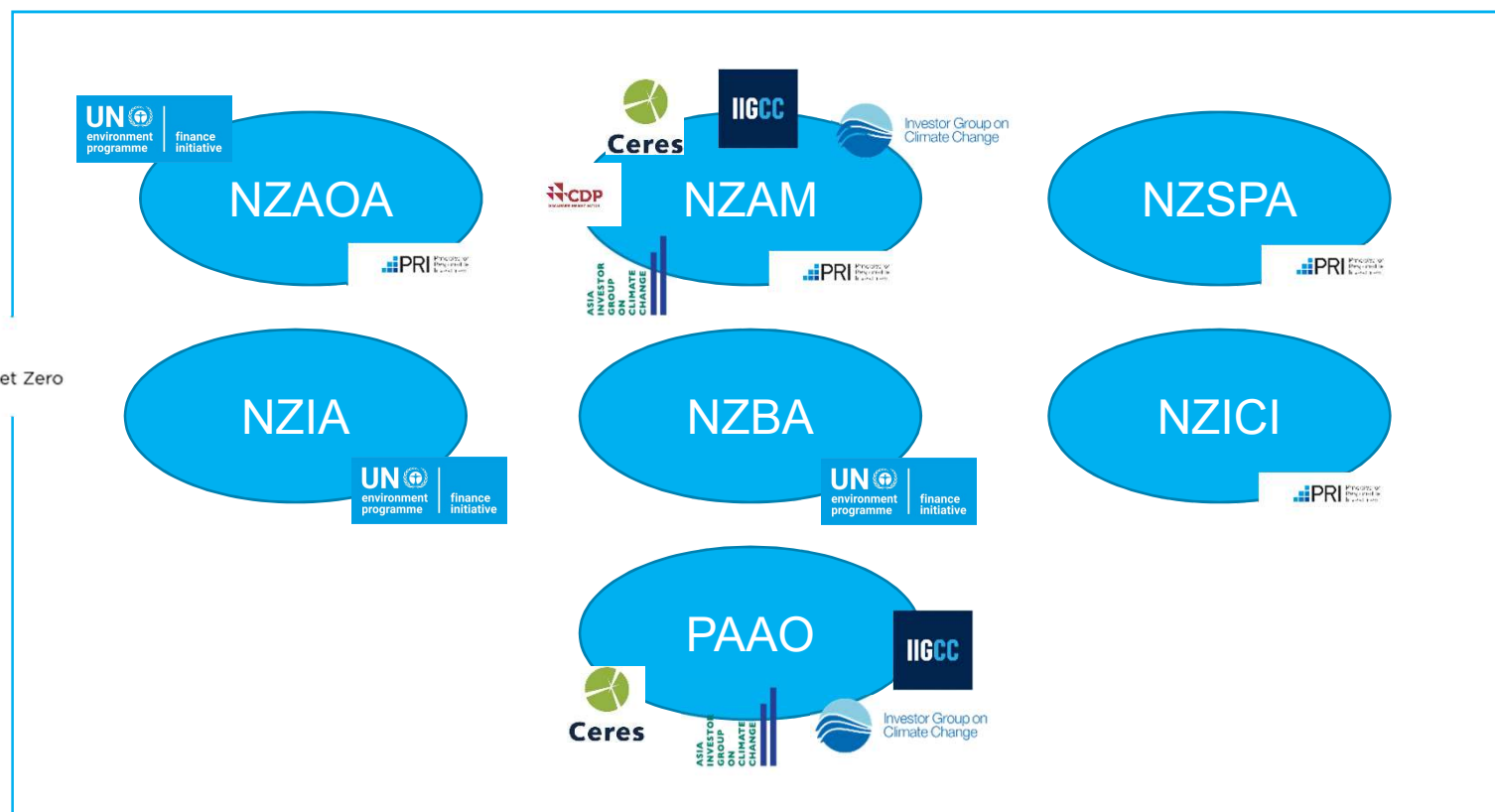
¿Por qué es importante para los inversores?

El Acuerdo de París tiene como objetivo:

- Detener el aumento de las temperaturas globales en más de 2,0 °C por encima de los niveles preindustriales;
- posiblemente, limitar el calentamiento aún mas: 1.5°C.
- Limitar el calentamiento global a 1,5 °C requiere cambios en la forma en que la sociedad y las empresas viajan, consumen recursos y generan energía.
- Considerar ahora las implicaciones que el cambio climático lleva en las inversiones

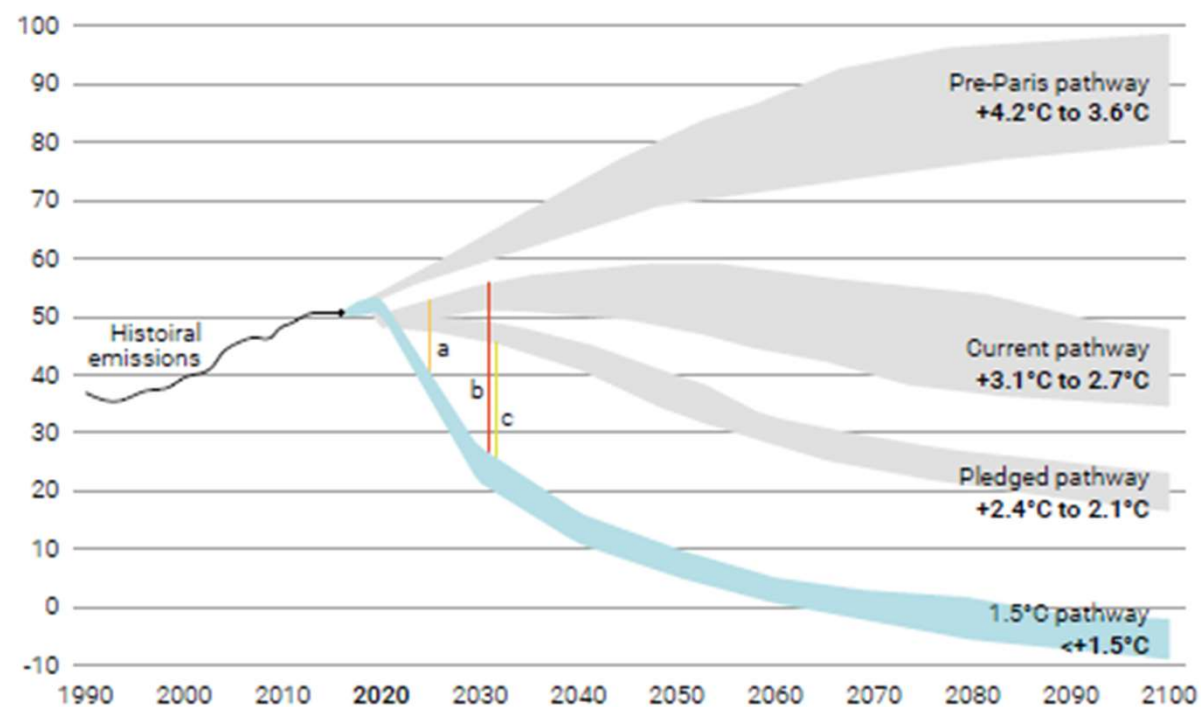


Visión general del panorama NZ para las instituciones financieras



Alinear las carteras con el acuerdo de París

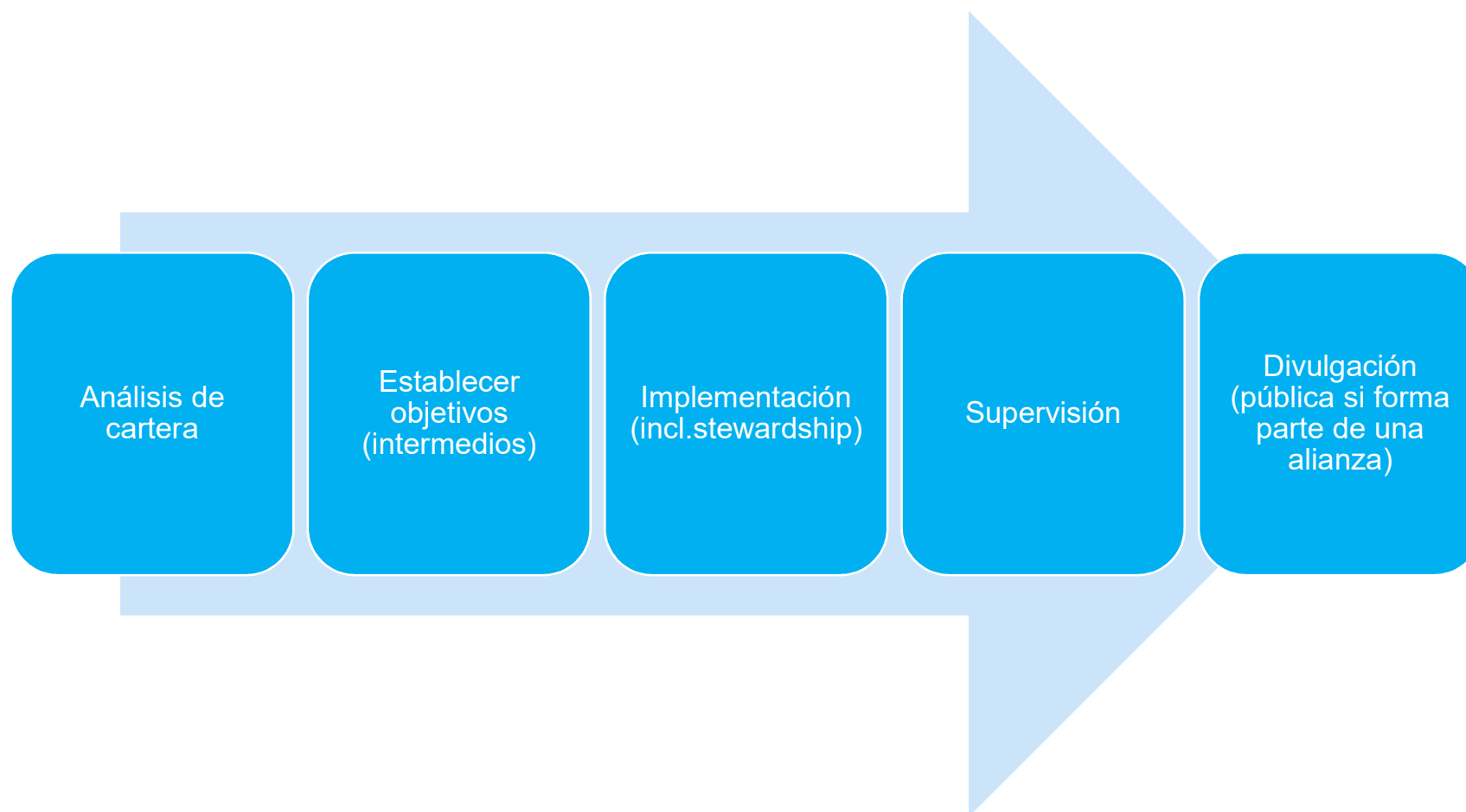
Diagram III: Illustration of scientific and real economy emissions pathway divergence



Source: [NZAOA progress report 2022](#)

Alinear las carteras con el acuerdo de París

The Net Zero Journey



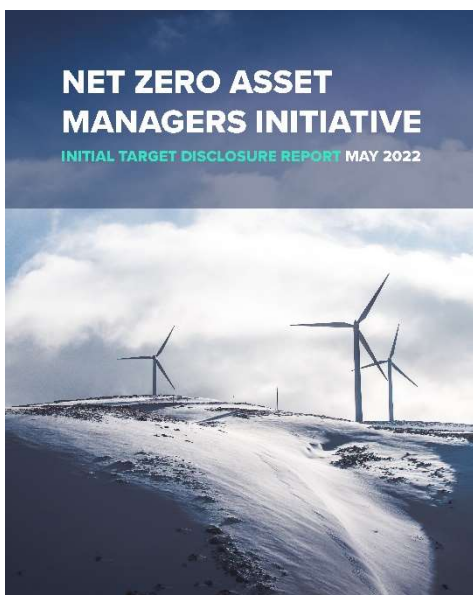
El compromiso de NZAM



1. Set **interim targets for 2030**, consistent with a fair share of the 50% global reduction in CO2 identified as a requirement in the IPCC special report on global warming of 1.5°C
2. Take account of portfolio **Scope 1 & 2 emissions** and, to the extent possible, material portfolio **Scope 3** emissions
3. **Prioritise the achievement of real economy emissions reductions** within the sectors and companies in which we invest
4. **If using offsets, invest in long-term carbon removal**, where there are no technologically and/or financially viable alternatives to eliminate emissions
5. As required, **create investment products aligned with net zero emissions by 2050** and facilitate increased investment in climate solutions
6. **Provide** asset owner **clients with information** and **analytics on net zero investing** and **climate risk and opportunity**
7. Implement a **stewardship and engagement strategy**, with a clear escalation and voting policy, that is consistent with our ambition for all assets under management to achieve net zero emissions by 2050 or sooner
8. **Engage with actors key to the investment system including credit rating agencies, auditors, stock exchanges, proxy advisers, investment consultants, and data and service providers** to ensure that products and services available to investors are consistent with the aim of achieving global net zero emissions by 2050 or sooner
9. Ensure any **relevant direct and indirect policy advocacy** we undertake is supportive of achieving global net zero emissions by 2050 or sooner
10. **Publish TCFD disclosures, including a climate action plan, annually, and submit them to the Investor Agenda via its partner organisations** for review to ensure the approach applied is based on a robust methodology, consistent with the UN Race to Zero criteria, and action is being taken in line with the commitments made here



Establecer objetivos para NZAM: conceptos básicos



- Todos se comprometen a aumentar sus activos comprometidos con cero neto al 100% de los AUM para el 2050
- Segundo conjunto de objetivos iniciales publicado en [mayo 2022](#)
- Con un actualización en [noviembre 2022](#)

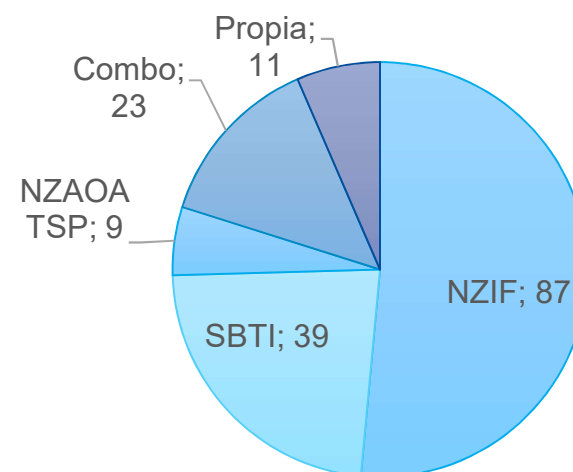


Establecer objetivos de Net Zero: NZAM

Compromisos y composición, situación a Noviembre 2002

- Los signatarios de la iniciativa tienen un año de tiempo para hacer su propia divulgación inicial de objetivos
- **291 signatarios: USD 66 tn AuM**
- 169 objetivos publicados por un total de **39% cubiertos por los objetivos reportados (approx. USD 21 tn de USD 55 tn totales)**
 - 97 signatarios superan el 50% de sus AuM
 - 63 signatarios comprometen más del 75% de sus AuM
 - 29 en proceso de revisión por parte de la iniciativa

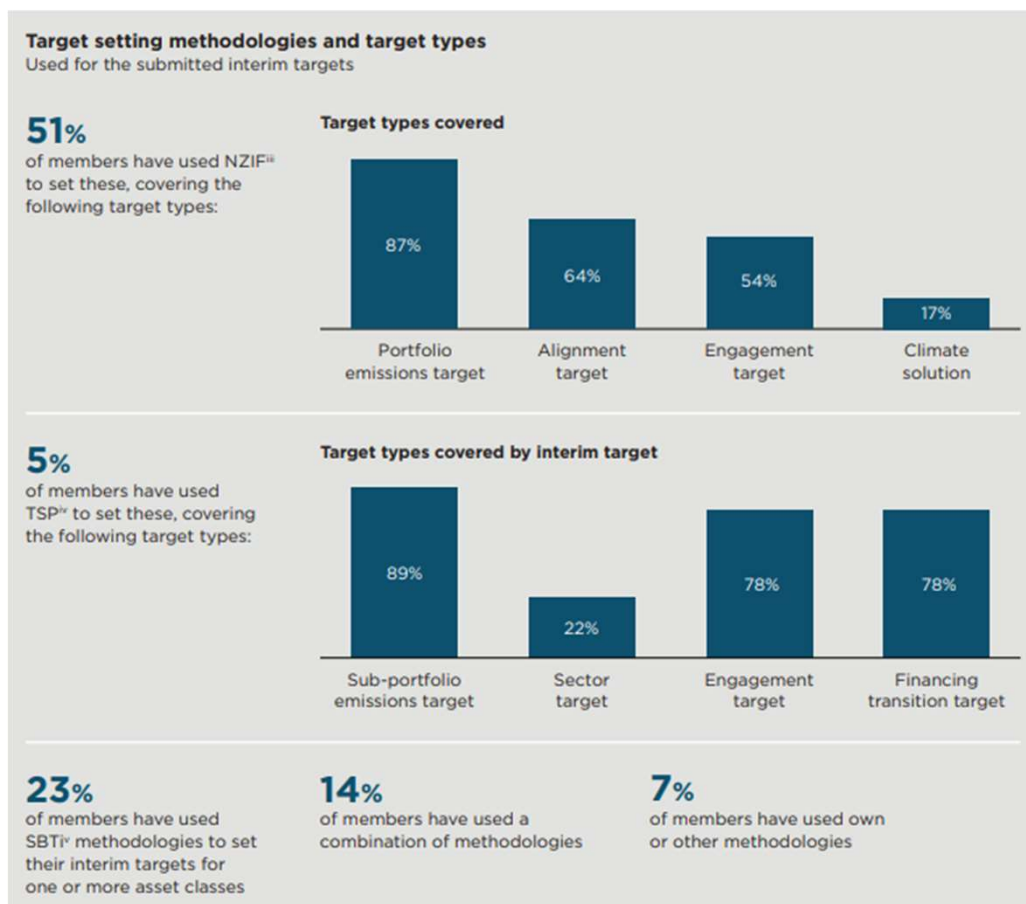
Source: [NZAM](#) (Nov. 2022)



- Paris Aligned Investment Initiative's Net Zero Investment Framework (NZIF)
- Science Based Targets initiative for Financial Institutions (SBTi)
- Net Zero Asset Owner Alliance Target Setting Protocol (TSP)
- Combination
- Metodología propia

Establecer objetivos de Net Zero: NZAM (cont.)

Más detalle sobre los objetivos intermedios divulgados por los signatarios



Source: [GFANZ progress report \(Nov.2022\)](#)

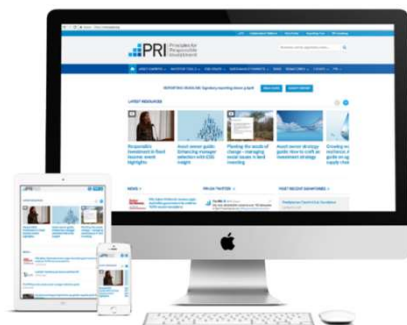
Una selección de recursos

No es una lista completa, para empezar el trabajo e inspirarse

- NZAM
 - Website link: [NZAM](#)
 - [Net Zero Asset Manager Initiative Initial Target Disclosure Report May 2022](#)
- NZIF
 - [Net Zero Investment Framework Implementation Guide – IIGCC](#)
- SBTi
 - [Financial institutions - Science Based Targets](#)
 - [Net-Zero Asset Owners Alliance— SBTi Finance Comparison Table](#)
- NZAO
 - Website link: [NZAO](#)
 - NEW: [Target setting protocol third edition](#)
 - [The Net-Zero Asset Owner Alliance FAQ](#)
- Alternativos
 - [A Case for Net Zero in Private Equity](#)
 - [Call to Action to Private Market Asset Managers](#) (Dec 22)
- Reporting
 - [Investor reporting framework | Reporting guidance | PRI \(unpri.org\)](#)
- Scenarios
 - [IEA: Net Zero by 2050 - A Roadmap for the Global Energy Sector](#)
 - [PRI | Inevitable Policy Response \(unpri.org\)](#)
 - [Below 1.5°C: a breakthrough roadmap to solve the climate crisis | One Earth](#)
- Otros
 - [Ten most significant moments in 2022](#) (Dec 22)
 - [GFANZ 2022 progress report](#)

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The Principles for Responsible Investment (PRI)

The PRI works with its international network of signatories to put the six Principles for Responsible Investment into practice. Its goals are to understand the investment implications of environmental, social and governance (ESG) issues and to support signatories in integrating these issues into investment and ownership decisions. The PRI acts in the long-term interests of its signatories, of the financial markets and economies in which they operate and ultimately of the environment and society as a whole.

The six Principles for Responsible Investment are a voluntary and aspirational set of investment principles that offer a menu of possible actions for incorporating ESG issues into investment practice. The Principles were developed by investors, for investors. In implementing them, signatories contribute to developing a more sustainable global financial system.

More information: www.unpri.org



Net Zero Santander AM

March 2023



Our Net Zero Commitment

SAM joined the Net Zero Asset Management Initiative (NZAMi) in March 2021 committing to support the goal of net zero greenhouse gas ('GHG') emissions by 2050, in line with global efforts to limit warming to 1.5°C. We have also committed to support investing aligned with net zero emissions by 2050 or sooner.

Specifically, SAM has committed to:

1. Work in partnership with asset owner clients on decarbonisation goals, consistent with an ambition to reach net zero emissions by 2050 or sooner across all assets under management.
2. Set an interim target for the proportion of assets to be managed in line with the attainment of net zero emissions by 2050 or sooner
3. Review our interim target at least every five years, with a view to ratcheting up the proportion of AUM covered until 100% of assets are included



NOVEMBER 2021

Road to Net Zero

 **Santander**
Asset Management | Where evolution meets tradition

SAM sets a 2030 interim target to reduce net emissions by half for 50% of AUM in-scope*

NET ZERO
ASSET MANAGER

 **Climate Action 100+**
Net-zero by 2050

 **IIGCC**
The International Institute for Green Capital

 **PRI** | Principles for Responsible Investment

*Assets in scope are 54% of SAM total assets that currently have a defined Net Zero methodology and for c.50% of them we have carbon metrics available today. This objective might be reviewed upwards depending on data availability.

NZAM actions to decarbonize Asset Managers portfolio's

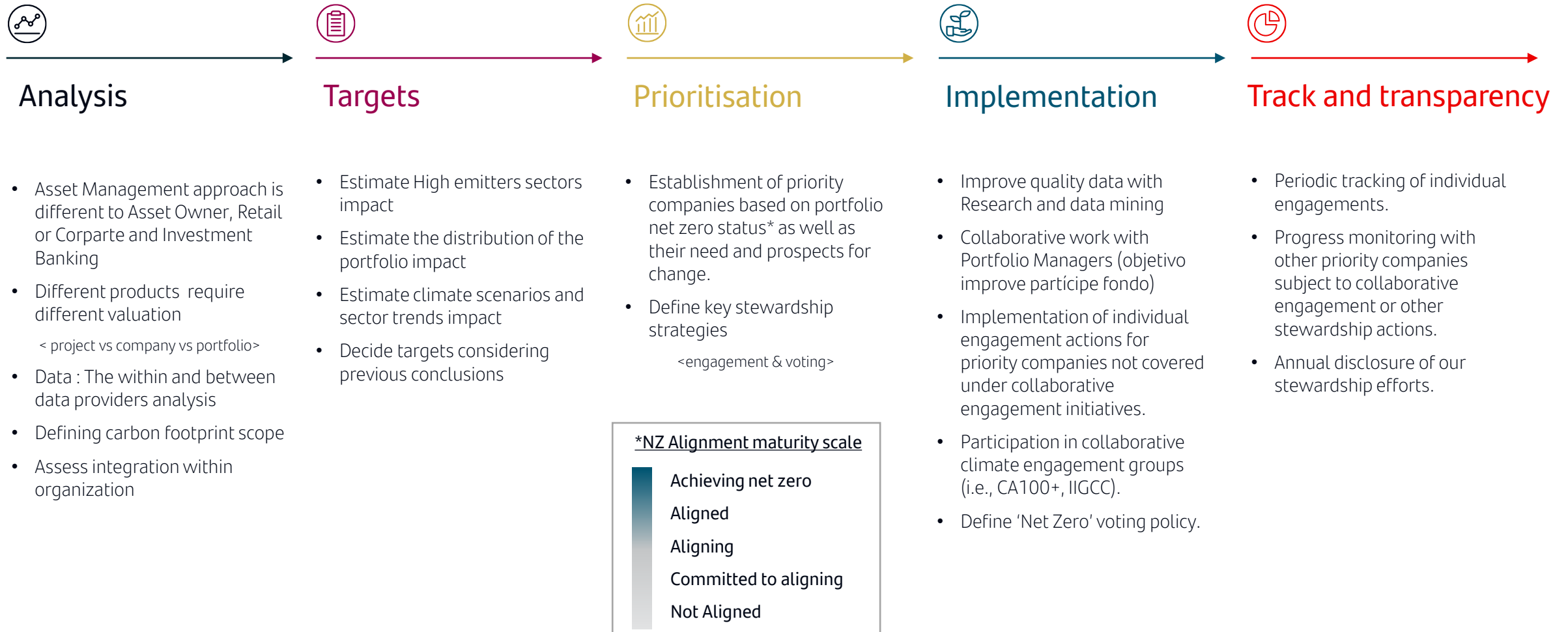
NZAM sets the organisational actions to be implemented by SAM in order to decarbonise its investment activities

Scope	Actions	
For assets within the scope to be managed in line with net zero by 2050	1. Set interim decarbonization targets aligned with 50% emissions reduction by 2030	Portfolio Integration
	2. To measure portfolio scope 1 & 2 emissions and scope 3 when possible	Engagement*
	3. Prioritise achievement of real economy emission reductions within sectors and companies invested	
	4. If using offsets, invest in long-term carbon removal where no technologically/financially viable alternatives	
	5. As required, create investment products aligned with net zero by 2050 and facilitate investments in climate solutions	
Across all assets under management	6. Provide asset owner clients with information and analytics on net zero investing and climate risk and opportunity	
	7. Implement a stewardship and engagement strategy, with a clear escalation and voting policy, that is consistent net zero by 2050 or sooner	
	8. Engage with key actors in the investment system to ensure products and services available to investors aligned with the goal	
	9. Ensure policy advocacy is supportive of achieving net zero by 2050	
Accountability	10. Publish TCFD disclosures, including a climate action plan, annually, and submit them to the Investor Agenda	

*SAM 2023 target is to develop a Net Zero Stewardship strategy that covers +70% of our financed emissions. This plan will include different levels of engagement actions and it will be applied in accordance with the priority of NZ actions.

Process to define NZ Santander AM Strategy

By developing a NZ strategy, we can demonstrate our commitment to achieving the targets derived from our NZ commitment while managing climate risks and opportunities and positioning ourselves as leaders in the transition to a low-carbon economy.



Details on Net Zero Alignment Maturity Scale

This classification helps us assess companies' progress towards aligning their strategies and operations with the goal of achieving net zero emissions by 2050 or earlier and identify areas for improvement.

<i>Evaluated criteria</i>	<i>Description</i>	Not Aligned	Committed to aligning	Aligning	Aligned	Achieving Net Zero
Ambition	Existence of a long-term goal to be Net Zero and by which year.		Net Zero commitment by 2050 or before is defined	Net Zero commitment by 2050 or before is defined	Net Zero commitment by 2050 or before is defined	Net Zero commitment by current reporting year or before
Targets	Existence of short- or medium-term reduction targets and their Implied Temperature Rise			Targets aligned with 1.5°-2°C	Targets aligned with 1.5°-2°C	Targets aligned with 1.5°-2°C
Emissions performance	Performance of current emissions compared to the related target				Achieved emissions reductions on-track with short- or medium-term target	Net Zero target is achieved
Disclosure	Disclosure of Scopes 1 and 2 emissions and material Scope 3 emissions			Company reports all material emissions	Company reports all material emissions	Company reports all material emissions
Decarbonisation Strategy	Development of a low-carbon transition plan			Company has developed a plan	Company has developed a plan	Company has developed a plan

Gracias

Thank You

Measuring Portfolio Alignment

Iren Levina

former Head of Portfolio Alignment
Mark Carney's COP26 Private Finance Hub



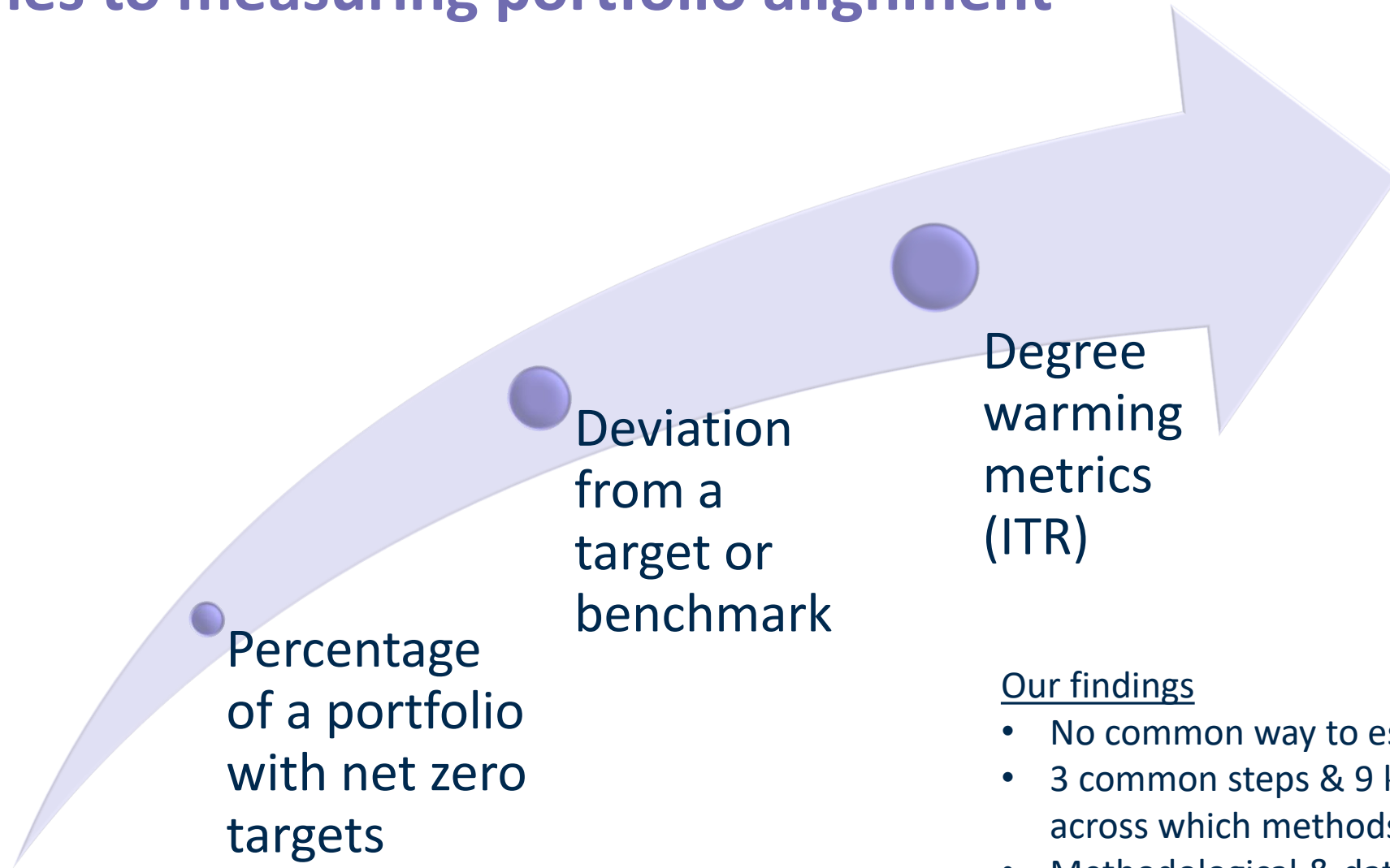
Rationale

- **Robust, comparable forward-looking metrics** are critical for a successful transition to net zero & credible transition plans.
- Businesses, investors and other stakeholders need to know **the position of companies and investment portfolios** on the path to net zero – to assess risks & opportunities.
- **Why use & disclose these metrics?**
 - Inform capital allocation
 - Track progress to net zero
 - Inform engagement & stewardship

Challenge

- Forward-looking metrics are **new and still evolving**.
 - Range of approaches, but until recently no common understanding how they relate to each other, which were more robust & good practice.
 - Especially the the case for the most novel methods – degree warming metrics (or implied temperature rise, ITR).
- The **Portfolio Alignment Team** was established to assess these approaches – with an aim to develop a common **framework & good practice recommendations**.

Approaches to measuring portfolio alignment



Our findings

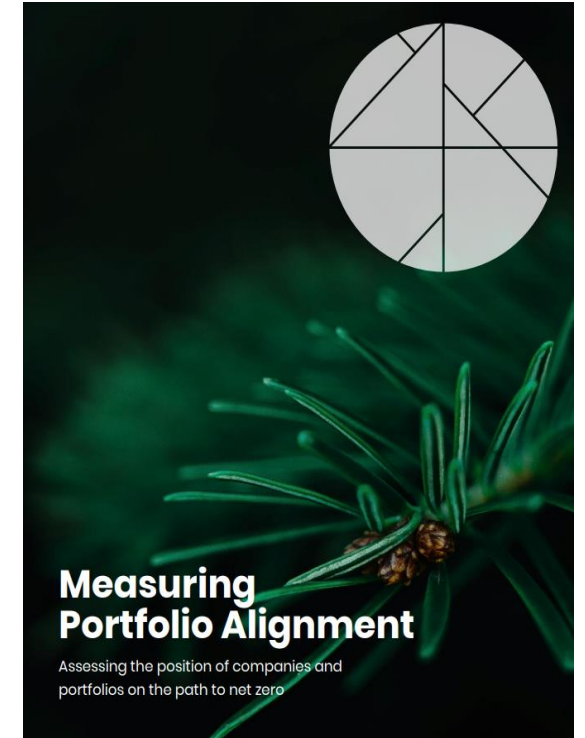
- No common way to estimate ITR
- 3 common steps & 9 key judgements across which methods differ
- Methodological & data input differences explain differences in estimates

Common steps & judgements across which methods differ

	KEY JUDGEMENT
Step 1 Translating carbon budgets into benchmarks	1. Benchmark type: temperature path vs warming functions
	2. Benchmark granularity
	3. Intensity vs absolute emissions
Step 2 Assessing company-level alignment	4. Scope of emissions
	5. Current company level emissions
	6. Future company level emissions
	7. Cumulative vs point-in-time
	8. How is the metric expressed
Step 3 Assessing portfolio-level alignment	9. Aggregation from company to portfolio level

Recommendations

- **Enhancement & convergence of methods around good practice:**
 - Use sector- and region- / country-specific scenarios, regularly updated
 - Include Scope 3 emissions, where useful & rigorous
 - Use best available emissions data & targets, third-party verified
 - Further work on intensity vs absolute benchmarks, how best to include Scope 3, and aggregation to portfolio level
- **Improvement of data inputs** (emissions, targets, pathways)



For more information, see:
<https://www.tcfdhub.org/resource/measuring-portfolio-alignment-assessing-the-position-of-companies-and-portfolios-on-the-path-to-net-zero/>

Progress, but further work is required

- This framework formed the basis for **TCFD guidance** on forward-looking metrics
- **GFANZ** has been driving enhancement, convergence and adoption of forward-looking metrics
- **Methodologies and data inputs** have been improving and converging, but further work is required

Everyone has a role to play – financial institutions, data & methodology providers, industry-led initiatives, and standard setters.

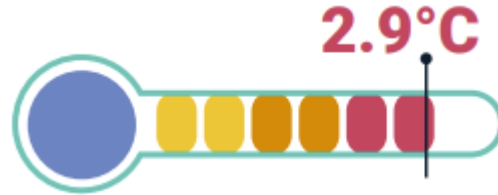
Producing a Degrees Warming Metric: Implied Temperature Rise

Banco de España
3 March 2023

Simone Ruiz-Vergote, MSCI ESG Research



1. Global warming embedded in corporate emissions



Listed companies are on track to cause average global temperatures to rise by 2.9°C above preindustrial levels by 2100.

2. Separating leaders from laggards



16% of listed companies align with 1.5°C

One-third of listed companies align with keeping global warming at or below 2°C

51% of listed companies align with future warming of greater than 2°C.

3. A tool that captures an investment's warming contribution

WHAT

Implied Temperature Rise (ITR)

- How does investment (company/portfolio) align with emissions reductions required to limit global warming to 2°C by end of century ?
- Delivers metric in °C warming, assuming global economy's carbon budget experiences same over/undershoot as the one by the company/portfolio
- Available for over 13k issuers.
- Builds on IPCC core assumptions regarding a 2°C scenario.
- Covers GHG emissions (Scope 1, 2, 3) across all sectors.
- Projects company emissions based on the full range of company decarbonization targets.
- Alignment/misalignment expressed in degrees Celsius.
- Company outputs can be aggregated for portfolio-level ITR

HOW

SAMPLE COMPANY

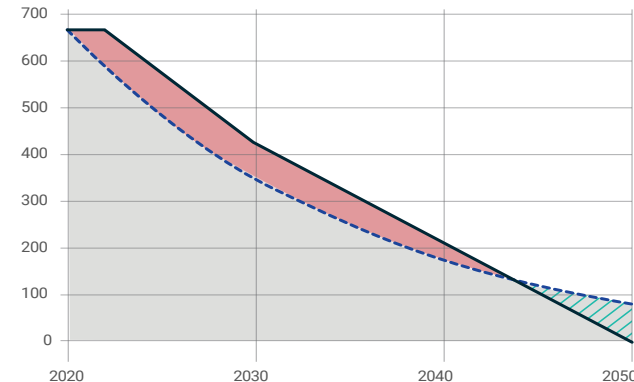


IMPLIED TEMPERATURE RISE **2.1°C**

LAGGING	MISALIGNED	2°C ALIGNED
---------	------------	-------------

2°C Trajectory

Absolute emissions [Megatons CO2e]



- Annual Projected Carbon Emissions
- - MSCI 2°C Trajectory (Annual Budget)
- Absolute Carbon Budget Overshoot
- Absolute Carbon Budget Undershoot

Building a Warming Metrics - Step-by-Step (details)

2

Project companies' future emissions, based on targets (or absence of)

- Based on current emissions and companies' disclosed targets

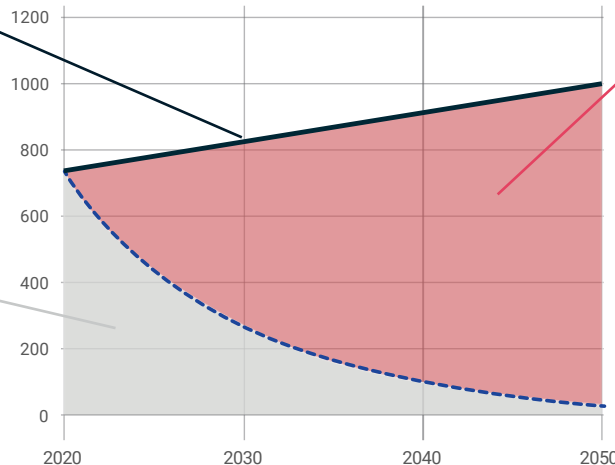
1

Define a company-level 2°C carbon budget

- Allocate to companies the overall emission budget (in tCO₂e) to be aligned with a 2°C warming in 2100, based on companies' revenue.
- Pathway's shape informed by analysis of Nationally Determined Contributions (NDCs)

2°C Trajectory

Absolute emissions [Megatons CO₂e]



- Annual Projected Carbon Emissions
- MSCI 2°C Trajectory (Annual Budget)
- Absolute Carbon Budget Overshoot
- Absolute Carbon Budget Undershoot

3

Compare 1 & 2 to measure under/overshoot

- $\text{Budget Overshoot} = \text{Projected Carbon Emissions} - 2^\circ\text{C Carbon Budget}$
- $\text{Relative Carbon Budget Overshoot} = \frac{\text{Absolute Carbon Budget Overshoot}}{\text{Cumulative } 2^\circ\text{C Carbon Budget in \%}}$

4

Convert over/undershoot in degree of Implied Temperature Rise

- Convert the relative carbon budget over/undershoot in degree of Implied Temperature Rise using science based TCRE (Transient Climate Response to Cumulative Emissions)
- TCRE is 0.000545°C per Gigatons of CO₂e (GtCO₂e) emitted¹.
- $\text{ITR} = 2^\circ\text{C} + \text{company level relative over/undershoot} \times \text{Global } 2^\circ\text{C Budget} \times \text{TCRE Factor}$



2.8°C

MISALIGNED

5. From engagement to reporting

Major use cases for Implied Temperature Rise



Disclose. Financial institutions may use ITR to help report **progress on net zero alignment**, e.g.:

- **TCFD** recommended¹ that financial institutions disclose alignment with well-below 2°C portfolio decarbonization trajectory.
- Mandatory for **UK** pension funds (since late 2022).
- **Switzerland** to mandate it for all large financial institutions (from 1 Jan 2024).



Engage. ITR can help investors when engaging with companies to better **calibrate their climate ambition** to align with a 2°C (or lower) warming pathway.



Allocate capital. ITR may allow investors to set **rigorous portfolio decarbonization targets**. It can also be used to help build net zero aligned financial products.

6. Outlook ITR 2.0 - planned enhancements



Switch to 1.5°C Fully Sector-Specific Benchmarks

- Leverage NGFS Net Zero scenario emissions pathways to create fully transparent 1.5°C compatible benchmarks
- Implement sector-specific benchmarks for Scope 3 emissions
- Assessment time horizon is now 2050, in line with the zero emissions date in 1.5°C scenario



Target Credibility Assessment

- Firm emissions path will be forecasted as a weighted average of BAU emissions and their target-implied path
- A firm's credibility weight will be driven by the existence of a short-term target, SBTi-validation, record of achieving past targets, and current progress to future targets



Enhanced Budget Rollover Approach

- Firms budget will now be updated by their sectoral revenue share in each year, rather than absolute revenue. Year-to-year ITR volatility driven by inflation and transitory sectoral growth are now eliminated.
- Budgets will be reduced in future years by realized emissions, punishing overshooting firms and ensuring consistency with a decreasing global carbon budget

• MSCI has conducted a consultation on these enhancements. Planned release by summer 2023.



ANNEX

A solid orange horizontal bar located directly beneath the word "ANNEX".

MSCI Overview



50

Years in Business



4,200 +

Employees



35

Global Locations



8,500+

Active Clients

Indexes



- MSCI ACWI Index
- MSCI World Index
- MSCI Emerging Markets Index
- Factor Indexes
- ESG and Climate Indexes
- Thematic Indexes

1290+ ETFs are based on MSCI indexes, more than any other index provider¹

258,000+ indexes calculated daily

14,600+ in real time

Analytics



- Risk Management
- Asset Allocation
- Fixed Income Analytics
- Multi-asset Class Factor Models

MSCI Global Risk and Performance Engine runs up to 1 trillion calculations/day

2 million time series

70+ million client positions

50+ global FI markets

9000+ issuer curves

ESG & Climate Research



- ESG Ratings & Scores
- ESG Fund Ratings
- ESG Screening & Controversies
- Climate Solutions
- Climate Value at Risk
- Sustainable Impact

World's largest provider of ESG data, research and indexes²

Over 4,800 ESG equity and fixed income indices²

Over 17,500 issuer ESG Ratings³

Private Real Estate



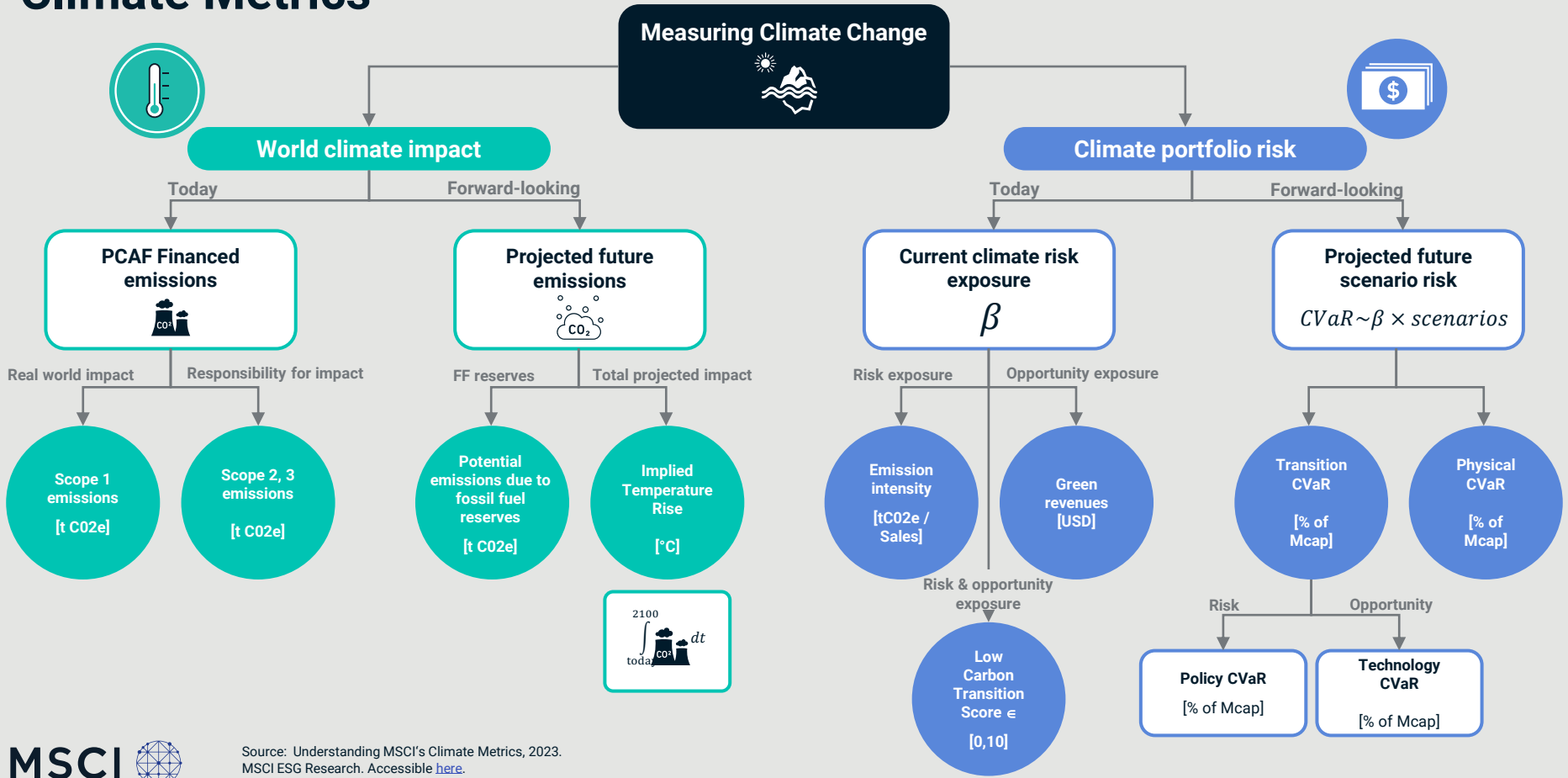
- Performance attribution services
- Risk Analytics
- Global market information
- Indexes

Global leader in Real Estate Index Analytics tools

In over 32 markets worldwide

Coverage spanning \$2 trillion of private real estate assets

Climate Metrics



About MSCI: ESG

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THE ROAD TO NET-ZERO: TRANSITION PLANS AND FORWARD- LOOKING ANALYSIS

Improving data availability for forward-looking indicators

José Manuel Marqués

Director of Financial Innovation and Market
Infrastructures Department
Banco de España
3rd March 2023



- **The intersection of technologies** such as artificial intelligence, the internet of things (IoT) and blockchain is particularly relevant to scale and solve limitations and operational problems in green finance.
 - Measurement of **carbon emissions**
 - Impact assessment of climate change materialization
 - Development of carbon trading markets
 - Standardization of climate-related **disclosure**
 - Verification and reliability of **climate data**

Private market



Public sector



BIS Innovation Hub work on green finance



Mapping technologies with solutions

Climate data

- **Earth Observation systems**



- **Digitalization**



- **Natural Language Processing**



Physical, Transition Risks & Biodiversity

- **Satellite imagery**



- **Digital twins**



- **Alternative data**



Connecting projects and investors

- **Online platforms**



- **Blockchain**



What can we do from Central Banks?

Monitoring, tracking & research

- **Machine Learning Methods in Climate Finance – a Systematic Review.**
Alonso-Robisco et al., DT [2310](#) BdE.



- **BIS Innovation Network**
 - Thematic priority: Green Finance



- **BIS Innovation Summit**
 - High-level panel: Technology to address heightened climate change risks



Experimentation

- **BIS Innovation Hub**

















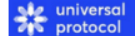
- **Project Viridis:** a climate risk platform for financial authorities
- **Project Genesis 1.0 & 2.0:** green bond tokenisation & smart-contract carbon credits
- **Project Gaia:** NLP to extract and manage climate-related data for supervision

Thanks!



Green Fintechs

- Sustainable Digital Finance Alliance (SDFA)** → First taxonomy of native green digital businesses.

Green Fintech Taxonomy						
1 Green digital payment and account solutions	2 Green digital investment solutions	3 Digital ESG-data and analytics solutions	4 Green digital crowdfunding and syndication platforms	5 Green digital risk analysis and insure-tech	6 Green digital deposit and lending solutions	7 Green digital asset solutions
<p>Payment platforms integrating green features as part of the payment experience. The green accounting software can be provided by an external provider. The payment provider using the software as well as the accounting software provider will both classify as green fintechs according to category one.</p> <p>Example of services:</p> <ul style="list-style-type: none"> Using transaction data for automated carbon accounting on payment transactions or accounting of environmental footprint on transactions including plastic or water footprints. Automated offsetting of green externalities. <p>  </p>	<p>Digital platforms that provide automated, algorithm-driven green financial planning and investment services with little to no human supervision.</p> <p>Example of services:</p> <ul style="list-style-type: none"> Retail algorithmic trading with a focus on green assets. Automated green investment advice. Automated green portfolio allocation. Risk assessment according to environmental criteria. <p> </p>	<p>Solutions for automated green data collection and analytics for finance, including automated green asset rating and indexing.</p> <p>Example of services:</p> <ul style="list-style-type: none"> Credit scoring algorithms that integrate green data in the credit decision. Automated ESG rating of companies & funds. Digital green indexing. <p> </p>	<p>Digital platforms for capital raising from a large number of individuals or from institutional investors to finance new green business ventures or projects.</p> <p>Example of services:</p> <ul style="list-style-type: none"> Green equity crowdfunding. Green loan crowdfunding. Green donation crowdfunding. <p> </p>	<p>Software and platforms that help optimize green insurance products and services as well as solutions to minimize physical climate and nature-related risks.</p> <p>Example of services:</p> <ul style="list-style-type: none"> Automated risk evaluation and monitoring tools Digital green insurance Dynamic pricing and underwriting of green assets IoT for green asset insurance e.g., real-estate, electric vehicles etc. Smart contracts for green claims handling. <p> </p>	<p>Digital savings options used to finance environmentally beneficial projects. Digital loans to finance projects or loans linked to green behaviors.</p> <p>Example of services:</p> <ul style="list-style-type: none"> Green digital loans. Green linked or transition loans with automated monitoring. Green digital mortgages. <p> </p>	<p>Tokens and crypto currencies with green properties and blockchain capital market infrastructure built for green use cases.</p> <p>Example of services:</p> <ul style="list-style-type: none"> Green utility tokens - can be a reward for lowering carbon emissions. Green asset tokens - can be a tokenized carbon credit or biodiversity offset. Green cryptocurrencies - can be a currency programmed only to be spent on green products. Green STO issuance platforms - a platform specifically designed to enable green proof of impact reporting and a green STO framework as part of the issuance process. <p> </p>

Clarity AI

Bringing Societal Impact to Markets

Tom Willman, Senior Regulation Product Specialist, Clarity AI
Madrid, March 3rd 2023

FoSDA - the proactive voice of the sustainable data ecosystem

- ▶ As the policy agenda for sustainable data evolves, there is a pressing need for a **louder voice of the ecosystem**.
- ▶ **No other group has gathered global sustainable data vendors**, NGOs and niche data providers together with supporters to focus on sustainable data.
- ▶ 2022 saw FoSDA *release* thought-leading reports on **Sovereign and Corporate ESG Gaps & Holes at COP27 and biodiversity data at COP15**; *launch* the **ESG & Sustainable Finance Data Skills Portal** with WEF; *engage* with multiple global policy makers and standard setters; *convene* the sustainable data ecosystem at global events.
- ▶ 2023 is an ambitious year for FoSDA; adding to our work on ESG Gaps & Holes, the new **Policy Working Group** will provide **focus on sustainable policy and standards** to empower the **sustainability data ecosystem to shape the agenda**.

FoSDA Ecosystem

Members







Associate Members

Supporters



Commercial Players

Niche Data Vendors
(ie: Geospatial data, sensor data, etc.)

Sustainability Data Vendors

Sustainability Data Tools Platforms & Scores

Index Providers

ESG & Sustainability Consultants & Advisors

Financial Exchanges with Data Streams

Banks

Asset Managers

Insurance Co's

Other Participants
(eg. City of London)





Organisations

NGO/Not for Profit Data Collection & Management & Influence

Financial Trade Bodies/ Organisations

Academics & Charities

Sustainable Finance Standards Bodies/ Frameworks

Central Banks

Other Governmental/Regulatory

FoSDA - Forward-looking data



Alongside ongoing work on **data gaps and holes**, specific report on **forward-looking data** published in 2021.

- Targets and commitments
- Indicators of external conditions
- Performance projections



Key concept that **forward looking data** - especially projections - more affected by three E's

- Estimation risk
- Extrapolation risk
- Errors

Remedy so that data can be coherent, consistent and comprehensive.



Data not the problem: part of solution. Harmonisation, normalisation and usability. **Data and innovation** are linked.

Why Do We Do What We Do?



CLARITY AI

Clarity AI brings societal impact to markets

We were founded in 2017 with that singular mission. We follow it to allow anyone to chart a path to a more sustainable world. By providing broader coverage and deeper, more transparent and granular data than any other sustainability tech platform, we create the opportunity to pause, to reflect, to check and to ensure dollars are aligned with intended purpose(s).

2017

Nov 2019

Jun 2020

Oct 2020

Jan 2021

Aug 2021

Aug 2022

Clarity AI
incorporated
in US

First product
launch

Elected Tech Pioneer
by WEF

Deutsche Börse
Investment

Funding round led by
BlackRock

Softbank
investment

Named a Leader in
The Forrester New
Wave™

Challenges Line the Path to a more Sustainable World

Investors have diverse needs and use cases, but common challenges



Asset Managers

“ I want to make more money
alpha in impact metrics/build
thematic funds”

I need to **report** to Institutions
& Regulators”



Wealth Managers

“ My customers (wealthy
individuals) want to **understand**
the sustainability of their
investments”



Asset Owners

“ I need to **report**
sustainability
to Pensioners &
Regulators”



Individual Investors

“ I want to **understand**
the **sustainability**
of my investments”

CHALLENGES



Data

Unavailable or unreliable,
fragmented data



Methodologies

No standard definition or
ratings of societal impact



Tools

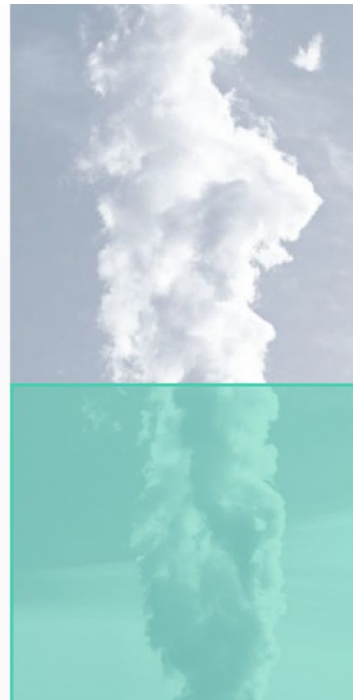
Lack of tools for analysis &
reporting

Case Study: How Technology Can Increase Data Reliability*

The Magnitude of the Data Reliability Issues

HOW PREVALENT ARE DATA DISCREPANCIES?

Clarity AI's research compared 30,000 data points from three leading data providers on direct CO2 emissions (Scope 1) reported by companies



42%
data points showed
reliability issues

* [Access Clarity AI's paper: "How Advanced Technology Can Increase Data Reliability"](#)

Case Study: How Technology Can Increase Data Reliability*

The Top Three Data Analysis Mistakes



ERROR 1

Human Reporting Errors

A leading data provider inaccurately reported Scope 1 emissions, by misreading a table from a publicly available Global Emissions Report.

Correct value

613,000 Tons

Reported value by
leading provider

1,208,000 Tons

Data Discrepancy Impact



Comparable to the yearly emissions of Puerto Rico, with an impact on industry benchmark

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ERROR 2

Inconsistent Reporting Boundaries

A leading data provider failed to account for joint ventures in total Scope 1 emissions, applicable in this case.

Correct value

1,998,000 Tons

Reported value by
leading provider

1,396,000 Tons

Data Discrepancy Impact



The missing Scope 1 emissions for this company are equivalent to the building and running of 2 gas fired power plants for an entire year

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ERROR 3

Incomplete Disclosures

A leading provider included only 45% of the company's Scope 1 and 2 emissions in its dataset, failing to include all the subsidiaries.

Correct value

220,000,000 Tons

Reported value by
leading provider

103,000,000 Tons

Data Discrepancy Impact



Comparable to Belgium's yearly emissions, and representing a 50 points difference in this company's ESG score

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* [Access Clarity AI's paper: "How Advanced Technology Can Increase Data Reliability"](#)

Data science at Clarity AI

Examples of lines of work



Natural Language Processing

- Automatic detection of Controversies
- Retrieve data from documents
- Determine compliance of policies



Machine Learning

- Estimation models for quantitative metrics
- Automated data reliability



Research and Innovation

- Scope 3 methodology and value chain
- CO2 emissions causal inference
- Biases in reported data

We leverage the latest technology to help accomplish our mission

Takeaways

How to build a successful AI-driven product



Partner with experts

- Close collaboration with **field experts** is key to building sound, explainable models.



Do the right thing...

- AI and ML are excellent tools to scale products, but they only add value if **tackling the right problem**.



... and do it right.

- ML and AI systems are complex. Keep a **scientific mindset** and always follow **good practices** and **governance**.



CLARITY AI

Recently named to *Fast Company's* annual list of the
World's Most Innovative Companies for 2023