Confidential
Executive Summary

Massive shift towards 1.5°C commitments as:

- Countries (e.g., China, France, UK, Japan, etc.) are legally committed;
- Investors coalitions (e.g., Net Zero Alliance) are being set-up.

Carbon budget approach (i.e., volume approach):

- Science (IPCC): carbon budget compliant with the 1.5°C objective (83% probability), i.e., 300 GtCO₂
- Portfolio construction based on it: 25% carbon emission haircut followed by an 8% reduction;
- Limited TE: from 0.08% towards 1.9%*
- Straightforward approach: transparent, simple, scalable and flexible.

Although, as the carbon budget shrinks, there is a major execution risk.

Policy makers could request investors’ carbon pathways: any distance with a 1.5° trajectory is a transition risk.

* Based on MSCI Europe
Global emission gaps

Unprecedented challenge

2100 Emission Projections

Gap to stay within 2C limit
27 GtCO2e

Gap to stay within 1.5C limit
37 GtCO2e

Gap to mitigate to achieve INDCs
46 GtCO2e

Source: Climate Action Tracker Database, Global emissions time series, updated November 2017. Time series data for INDCs, 2C consistent, 1.5C consistent time series are computed as medians of highest and lowest potential global emission level results.
Impacts of Temperatures on Where to Live

Human beings must regulate their internal heat, and so they are exposed to the mix of:
- External temperatures;
- Humidity.

In 2000*, this was already a severe risk:
- 13.2% of the planet’s land area where 30.6% of the population resides…
- …was exposed to 20 or more days when temperatures and humidity surpassed the threshold beyond which such conditions become deadly.

By the end of the century, in a BAU scenario, entire regions of the world would be inhabitable.

* Source: Global Risk of Deadly Heat (Nature 2017)
Climate Change: A Green Swan

– Climate change is a “Green Swan”\(^1\):
  – Is certain;
  – Carries a variety of non-linear and interacting risks: physical, regulatory, and societal;
  – Could lead to extreme losses in the short term and even put human lives at risk.

– Climate change is a systemic risk that:
  – Can’t be hedged;
  – Goes beyond a corporate/investors way of being solved;
  – Is now in the agenda of 95 Central Banks:
    – Network for Greening the Financial System;
    – As it threatens financial stability.

Recent Global convergence towards 1.5° alignment

- **113 countries** have committed to be carbon neutral:
  - ~50% world GDP;
  - 9 countries have set legally binding targets;
  - Countries with large pools of assets.

- **Asset Owners: Net Zero Asset Owner Alliance**
  - 33 institutional investors;
  - $6.6 trillion AUM;
  - Transition investment portfolios to net-zero GHG emissions by 2050.

- **Asset Managers: Net Zero Asset Managers Initiative**
  - 73 signatories;
  - $43 trillion AUM
  - Work in collaboration with clients to achieve target-based net zero goal by 2050 or sooner.
What is a Net-Zero Portfolio?

- In model pathways with no or limited overshoot of 1.5°C, global net anthropogenic CO₂ emissions:
  - Decline by about 45% from 2010 levels by 2030 (40–60% interquartile range);
  - Reaching net zero around 2050 (2045–2055 interquartile range).

Source: IPCC Special Report on Global Warming of 1.5°C

- According to the IPCC, limiting global-warming below 1.5°C with a 83% probability requires:
  1. Decreasing carbon emissions to zero by 2050;
     i.e.: Any anthropogenic emissions to be balanced out by carbon removal
  1. Spending the entire 300GtCO₂ budget by 2050;
  2. Not counting on existing natural capture systems anymore (oceans and lands).

- Link carbon emissions/temperature:
  - As carbon emissions determine the level of global warming;
  - Determining the temperature of a portfolio or a corporate implies to determine its level of carbon emissions.
Neutrality: Reducing and Capturing

Carbon neutrality means:

- 83% probability to achieve 1.5°C increase;
- To have spent 268.5GtCO₂ by 2050; (i.e., 8.5X the initial carbon footprint after a 3.15 spending in 2021)
- Spend then 10GtCO₂ compensated by carbon capture;
- Not to count on lands and oceans over the period anymore.

Source: Bolton et al. 2022
Strong Reductions Needed Although Increase is Expected

- Forward looking:
  - +1.75%/year;
  - +65% overall increase*.

- We are not even on a trajectory to decrease, but quite the opposite.

- While the level must tend to zero.

*Based on a 2% GDP growth

Source: Iceberg Data Lab and calculated on the MSCI Europe Universe
300GtCO₂ Budget Translated into a Real Portfolio

Assumptions:
- The portfolio sector allocation is aligned with the activity

Then, the index has a:
- Carbon budget to spend for the next 30 years equivalent to 11.7 times the initial carbon footprint
- Final target equivalent to:
  - Either zero (with the assumption of no carbon capture) or
  - 32% of N (with some carbon capture) of the initial carbon footprint
  - See appendix

<table>
<thead>
<tr>
<th>Activity</th>
<th>Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumption: the portfolio is aligned in terms of sectors with the activity</td>
<td></td>
</tr>
<tr>
<td>i.e., the portfolio is a proxy of the activity</td>
<td></td>
</tr>
<tr>
<td>The portfolio follows the same objectives as the activity</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Index</th>
<th>Initial</th>
<th>Budget</th>
<th>Final Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>N GtCO₂</td>
<td>11.7N</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

With N:
- Being the initial footprint of the portfolio
- It can be estimated as the percentage of the capital owned * emissions at inception
Baseline Scenario (e.g., MSCI Europe and with a 83% probability)

CO2 Emissions

2020: 3.4Gt CO2

2050: 0.07Gt CO2 (-95%)

Budget= 29Gt CO2**
i.e., 8.5*initial spot

Tracking Error

2021: 0.08%

2050: 1.9%

Assumptions:
- 25% initial reduction followed by a geometric 8% annual reduction over 29 years;
- Scope 1, 2 and 3 upstream (Trucost) & emissions to remain constant;
- TE minimization & sector deviation constraint (+/- 2% compared to initial portfolio).

Results:
- The active risk generated remains very low;
- It is starting from .08% towards 1.90% in 2050 (below 1% until 2040).

**Estimated with BARRAONE risk model

** Final target of 2Gt CO2 rather than 0 to avoid finishing with an empty portfolio.
Sector Exposure (on MSCI Europe with a 83% probability)

It is possible to be net zero aligned...

...with a limited sector deviation
## Portfolio Allocation (on MSCI Europe and with 83% probability)

<table>
<thead>
<tr>
<th>Corporate</th>
<th>Initial Portfolio</th>
<th>Corporate</th>
<th>25% Haircut</th>
<th>Corporate</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>NESTLE SA-REG</td>
<td>3,08%</td>
<td>NESTLE SA</td>
<td>3,54%</td>
<td>L’OREAL SA</td>
<td>4,05%</td>
</tr>
<tr>
<td>ROCHE HLDG AG-GENUSS</td>
<td>2,14%</td>
<td>ROCHE HOLDING AG</td>
<td>2,47%</td>
<td>GIVAUDAN SA</td>
<td>3,07%</td>
</tr>
<tr>
<td>NOVARTIS</td>
<td>1,82%</td>
<td>NOVARTIS AG</td>
<td>2,10%</td>
<td>ROCHE HOLDING AG</td>
<td>3,03%</td>
</tr>
<tr>
<td>ASML HOLDING NV</td>
<td>1,66%</td>
<td>ASML HOLDING NV</td>
<td>1,95%</td>
<td>ASML HOLDING NV</td>
<td>2,96%</td>
</tr>
<tr>
<td>LVMH MOET HENNESSY</td>
<td>1,51%</td>
<td>LVMH MOET HENNESSY LC</td>
<td>1,74%</td>
<td>NOVARTIS AG</td>
<td>2,82%</td>
</tr>
<tr>
<td>AstraZeneca GBP</td>
<td>1,26%</td>
<td>AstraZeneca PLC</td>
<td>1,43%</td>
<td>LVMH MOET HENNESSY LC</td>
<td>2,28%</td>
</tr>
<tr>
<td>SAP SE</td>
<td>1,13%</td>
<td>SAP SE</td>
<td>1,32%</td>
<td>ALLIANZ SE</td>
<td>2,17%</td>
</tr>
<tr>
<td>SANOFI</td>
<td>1,05%</td>
<td>SANOFI SA</td>
<td>1,22%</td>
<td>SAP SE</td>
<td>2,15%</td>
</tr>
<tr>
<td>Novo Nordisk A/S-B NEV</td>
<td>1,05%</td>
<td>Novo Nordisk A/S</td>
<td>1,21%</td>
<td>Lundin Energy AB</td>
<td>2,06%</td>
</tr>
<tr>
<td>TOTAL SE</td>
<td>1,03%</td>
<td>Totalenergies SE</td>
<td>1,20%</td>
<td>AstraZeneca PLC</td>
<td>1,98%</td>
</tr>
<tr>
<td>HSBC HOLDING PLC GBP</td>
<td>1,00%</td>
<td>HSBC Holdings PLC</td>
<td>1,15%</td>
<td>Reckitt Benckiser Grou</td>
<td>1,91%</td>
</tr>
<tr>
<td>Siemens AG-REG</td>
<td>0,94%</td>
<td>Siemens AG</td>
<td>1,09%</td>
<td>Porsche Automobil Ho</td>
<td>1,62%</td>
</tr>
<tr>
<td>Allianz SE</td>
<td>0,91%</td>
<td>Allianz SE</td>
<td>1,05%</td>
<td>Novo Nordisk A/S</td>
<td>1,61%</td>
</tr>
<tr>
<td>GlaxoSmithKline PLC</td>
<td>0,85%</td>
<td>GlaxoSmithKline PLC</td>
<td>0,97%</td>
<td>Sanofi SA</td>
<td>1,58%</td>
</tr>
<tr>
<td>Diageo</td>
<td>0,85%</td>
<td>Diageo PLC</td>
<td>0,96%</td>
<td>Relx PLC</td>
<td>1,53%</td>
</tr>
<tr>
<td>L’Oreal</td>
<td>0,84%</td>
<td>Unilever NV</td>
<td>0,92%</td>
<td>United Utilities Group</td>
<td>1,36%</td>
</tr>
<tr>
<td>Unilever NV</td>
<td>0,82%</td>
<td>Iberdrola SA</td>
<td>0,89%</td>
<td>Swissscom AG</td>
<td>1,14%</td>
</tr>
<tr>
<td>Enel Spa</td>
<td>0,76%</td>
<td>British American Tobacco</td>
<td>0,87%</td>
<td>Hsbc Holdings PLC</td>
<td>1,14%</td>
</tr>
<tr>
<td>British Amer Tobacco</td>
<td>0,76%</td>
<td>Enel Spa</td>
<td>0,85%</td>
<td>Dnb Bank ASA</td>
<td>1,11%</td>
</tr>
<tr>
<td>Iberdrola SA</td>
<td>0,74%</td>
<td>Schneider Electric SE</td>
<td>0,83%</td>
<td>Prudential PLC</td>
<td>1,11%</td>
</tr>
<tr>
<td>Schneider Elect SE</td>
<td>0,72%</td>
<td>Air liquide SA</td>
<td>0,81%</td>
<td>Wolters Kluwer NV</td>
<td>1,05%</td>
</tr>
<tr>
<td>Air liquide SA</td>
<td>0,71%</td>
<td>Rio Tinto PLC</td>
<td>0,79%</td>
<td>Symrise AG</td>
<td>1,04%</td>
</tr>
<tr>
<td>Royal Dutch Shell-A</td>
<td>0,68%</td>
<td>Royal Dutch Shell PLC</td>
<td>0,75%</td>
<td>Kering</td>
<td>0,99%</td>
</tr>
<tr>
<td>Rio Tinto PLC (GBR)</td>
<td>0,68%</td>
<td>Unilever PLC</td>
<td>0,75%</td>
<td>Experian PLC</td>
<td>0,99%</td>
</tr>
<tr>
<td>BP PLC</td>
<td>0,67%</td>
<td></td>
<td></td>
<td>Beiersdorf AG</td>
<td>0,98%</td>
</tr>
</tbody>
</table>
Possible Form of Active Engagement (on MSCI Europe and with 83% probability)

**Disinvestment Roadmap for Utilities**
- Investors have tools to engage with corporates on their disinvestment roadmap.
- It creates a competition within each sector.
- Tool for CEOs from carbon intensive companies to mobilize internally.
- Exit roadmaps evolve with volatility/correlation factors as well.

**Disinvestment Roadmap for Energy**

---

**Amundi Asset Management**
Time Impact (on MSCI Europe and with 83% probability)

- The more we wait, the more we consume the 300GtCO₂ budget, and the less we have time to adjust the portfolios.

- In 2021, a 10% per annum reduction based on the initial CO₂ level leads to achieve the goal.

- In 5 years from now, it almost doubles.

- By 2029, it becomes impossible.
Carbon Pathway for Investors

- Investors should disclose their carbon pathway taking into account:
  - Their carbon reduction policy
  - Forward carbon footprint

- The distance with the 1.5° pathway is a simple, robust way to assess investor’s transitioning risks
Research Paper

Net-Zero Carbon Portfolio Alignment
Patrick Bolton, Marcin Kacperczyk, and Frédéric Samama

This draft: September 13, 2021

Abstract

This paper outlines a simple and robust methodology for portfolio managers to align their portfolios with the carbon neutrality goals (Net Zero Targets) set out following the Paris Agreement in 2015. The approach is based on dynamically limiting the portfolio carbon footprint so that it satisfies a time-varying, science-based, carbon budget consistent with maintaining an average temperature rise to less than 1.5°C. We show how the tracking error of a Net Zero Aligned portfolio with respect to a global market index can be maintained at a negligible level for large portfolios even as they progressively reduce their carbon footprints to remain within their carbon budget.

“Net-Zero Carbon Portfolio Alignment” co-written by:

- Patrick Bolton (Columbia University);
- Marcin Kacperczyk (Imperial College);
- Frédéric Samama (CPR am).

Available on SSRN.
Already Implemented into Climate Action (CPR am)

Our Climate Action fund has reduced its CO2 volume by about 40% over the past two years (ahead of the curve compared to the GIEC objective, i.e. 7.2% per year for a starting point in 2019).

Corporates have either changed their emissions (e.g.: Energias de Portugal) or we have operated a portfolio rotation (e.g., exit of Thyssen and Repsol)
**MSCI World (with a 83% Probability)**

**CO2 Emissions**

2020: 7.32 Gt CO2

2050: 0.49 Gt CO2 (-93%)

Budget = 62.2 Gt CO2

i.e., 8.5*initial spot

---

**Assumptions:**

- 25% initial reduction followed by a geometric 8.1% annual reduction over 29 years;
- Scope 1, 2 and 3 upstream (Trucost) & emissions to remain constant;
- TE minimization & sector deviation constraint (+/- 2% compared to initial portfolio).

---

**Results:**

- The active risk generated remains very low;
- It is starting from .02% towards 0.74% in 2050 (below 0.5% until 2045).

---

*Estimated with BARRAONE risk model*

**Final target of 2Gt CO2 rather than 0 to avoid finishing with an empty portfolio.*
MSCI EM (with a 83% Probability)

CO2 Emissions

2020: 9.94 Gt CO2

2050: 0.66 Gt CO2 (-93%)

Budget = 84.5 Gt CO2**
i.e., 8.5*initial spot

Assumptions:

- 25% initial reduction followed by a geometric 8% annual reduction over 29 years;
- Scope 1, 2 and 3 upstream (Trucost) & emissions to remain constant;
- TE minimization & sector deviation constraint (+/- 2% compared to initial portfolio).

Results:

- The active risk generated remains very low;
- It is starting from 0.03% towards 0.66% in 2050.

Estimated with BARRAONE risk model

** Final target of 2Gt CO2 rather than 0 to avoid finishing with an empty portfolio.
**Use of Forecast Emission** (on MSCI Europe and with 83% probability)

**CO2 Emissions**

2020: 3.4Gt CO2

2050: 0.07Gt CO2 (-95%)

**Budget= 29Gt CO2**

i.e., 8.5*initial spot

---

**Assumptions:**

- 25% initial reduction followed by a geometric 8% annual reduction over 29 years;
- Scope 1, 2 and 3 upstream (Trucost) & emissions to remain constant;
- TE minimization & sector deviation constraint (+/- 2% compared to initial portfolio).

---

**Results:**

- The active risk generated remains very low;
- It is starting from .08% towards 1.25% in 2050 (below 1% until 2045).

---

*Estimated with BARRAONE risk model*

**Final target of 2Gt CO2 rather than 0 to avoid finishing with an empty portfolio.*
**Impacts of Size** (e.g., MSCI Europe and with a 83% Probability)

- **Assumptions:**
  - 25% initial reduction followed by a geometric 8% annual reduction over 29 years;
  - Scope 1, 2 and 3 upstream (Trucost) & emissions to remain constant;
  - TE minimization & sector deviation constraint (+/- 2% compared to initial portfolio).

- **Results:**
  - Even for a portfolio of 1000 billion EUR, the Tracking Error remains low;
  - The strategy we propose is scalable!

*Estimated with BARRAONE risk model*
Number of Stocks in a Portfolio (on MSCI Europe and with 83% probability)

The number of stocks gradually decreases:
- from just below 450 companies in 2020…
- to approximately 200 by 2050
Possible Use of Forward Looking for the Data (1/2)

- **Initial step:**
  - The methodology estimates the carbon footprint to spend for the next (3) years, and each corporate budget based on the corporate carbon guidance;
  - The portfolio construction is based on this estimate while trying to reduce the TE.
- **Regular rebalancing):**
  - There is then an observation of what has been effectively spent by the chosen corporates;
  - The new budget takes into account the +/- observed and deducts/adds it to the next budget.
Possible Use of Forward Looking for the Data (2/2)

Portfolio construction:

- Assumption: carbon budget for the next 3 years 150
- Weighting is based on the corporate carbon guidance for the next three years

<table>
<thead>
<tr>
<th>Corporate</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Sum</th>
<th>Portfolio Weight*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate A</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
<td>20%</td>
</tr>
<tr>
<td>Corporate B</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>30</td>
<td>20%</td>
</tr>
<tr>
<td>Corporate C</td>
<td>0</td>
<td>15</td>
<td>15</td>
<td>30</td>
<td>20%</td>
</tr>
<tr>
<td>Corporate D</td>
<td>12</td>
<td>10</td>
<td>8</td>
<td>30</td>
<td>20%</td>
</tr>
<tr>
<td>Corporate E</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>30</td>
<td>20%</td>
</tr>
<tr>
<td>Sum</td>
<td>47</td>
<td>55</td>
<td>48</td>
<td>150</td>
<td></td>
</tr>
</tbody>
</table>

* If we only take into account the carbon footprint

Corporates that are carbon intensive but on the right track are rewarded

Corporates that are carbon friendly but not on the right track are not overweighted at inception
### Carbon Budget: 300GtCO₂ with Uncertainties

<table>
<thead>
<tr>
<th>Approximate global warming relative to 1850–1900 until temperature limit (°C)* (1)</th>
<th>Additional global warming relative to 2010–2019 until temperature limit (°C)</th>
<th>Estimated remaining carbon budgets from the beginning of 2020 (GtCO₂)</th>
<th>Variations in reductions in non-CO₂ emissions* (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>0.43</td>
<td>900 650 500 400 300</td>
<td>Higher or lower reductions in accompanying non-CO₂ emissions can increase or decrease the values on the left by 220 GtCO₂ or more</td>
</tr>
<tr>
<td>1.7</td>
<td>0.63</td>
<td>1450 1050 850 700 550</td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td>0.93</td>
<td>2300 1700 1350 1150 900</td>
<td></td>
</tr>
</tbody>
</table>

- **300 GtCO₂ budget with a 83% probability**
- **At the current path, about 8.5 years**
- **With only a reasonable level of confidence (medium) due to:**
  - Permafrost: -100GtCO₂
  - Non CO₂ emissions: +/-250GtCO₂
  - Link CO₂/temperatures: +/-250GtCO₂
  - Etc.
Temperatures’ Assessments Based on CO₂ Volumes

Every tonne of CO₂ emissions adds to global warming

Global surface temperature increase since 1850-1900 (°C) as a function of cumulative CO₂ emissions (GtCO₂)

- Straightforward approach to assess portfolios’ temperatures:
  - Translate the link CO₂- volume by 2050 and temperatures;
  - 500 GtCO₂ leads to 1.5°;
  - 1,700 GtCO₂ leads to 4°.

- In other words, a portfolio that has a CO₂ volume by 2050 that has a:
  - 500/30* ratio is then 1.5° aligned;
  - 1,700/30* ratio is then 4° aligned;
  - And a linear regression applies.

- It requires to assess corporates’ temperatures by 2050, but an alternative can be developed by translating the 500 and 1,700 figures into growths/decreases.

* Initial CO₂ level
Investors are confident that:

- Corporates will adjust their carbon footprint according to the carbon budget or
- New carbon capture technologies will be so efficient that they will reduce the pressure on the polluting companies

Initial action: Carbon budget index with a low TE

Observation (midterm): It happens according to the scenario

Conclusion: the carbon budget index just continues replicating the parent index with
  - Low TE
  - Low turnover
Investors are confident that:

- Corporates will adjust their carbon footprint according to the carbon budget or
- New carbon capture technologies will be so efficient that they will reduce the pressure on the polluting companies

**Initial action:** Carbon budget index with a low TE

**Observation (midterm):** the assumption is proven to be wrong

**Conclusion:** the carbon budget index must massively reduce its carbon footprint thus generating:

- High TE
- High turnover (during the reshuffle)
The carbon budget index:
- Must switch to the index composition (possibly generating a high turnover)
- Thus has a low TE

- **Investors are not confident that:**
  - Corporates will adjust their carbon footprint according to the carbon budget or
  - New carbon capture technologies will be so efficient that they will reduce the pressure on the polluting companies

- **Initial action:** high initial carbon reduction (and thus high TE)

- **Observation (midterm):** corporates then massively reduce their carbon footprint (or surge of massive carbon capture solutions)

- **Conclusion:** the carbon budget index reshuffles its weightings to stick to the parent index and thus generates:
  - Low TE
  - High turnover (during the reshuffle)
The carbon budget index:
- Must continue gradually reducing its carbon footprint
- With, possibly, an increase of TE that is limited as most of the efforts have already been done

- **Investors are not confident that:**
  - Corporates will adjust their carbon footprint according to the carbon budget or
  - New carbon capture technologies will be so efficient that they will reduce the pressure on the polluting companies

- **Initial action:** high initial carbon reduction (and thus high TE)

- **Observation (midterm):** the assumption is proven to be right (low adjustment from corporates)

- **Conclusion:** the carbon budget index must continue reducing its carbon footprint with:
  - A reduced increase of the TE as most of the efforts have already been done
  - Low turnover
PAB Indexes: summary

<table>
<thead>
<tr>
<th>MINIMUM STANDARDS</th>
<th>EU CTB</th>
<th>EU PAB</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RISK-ORIENTATED MINIMUM STANDARDS:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum scope 1+2+(+3) carbon intensity reduction compared to investable universe</td>
<td>30%</td>
<td>50%</td>
</tr>
<tr>
<td>Scope 3 Phase-In</td>
<td>Up to four years</td>
<td></td>
</tr>
<tr>
<td>Baseline Exclusions</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>• Controversial Weapons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Societal norms violators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity Exclusions</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>• Coal (1%+ revenues)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Oil (10%+ revenues)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Natural Gas (50%+ revenues)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Electricity producers with carbon intensity of lifecycle GHG emissions higher than 100gCO2e/kWh (50%+ revenues)</td>
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| OPPORTUNITY ORIENTATED MINIMUM STANDARDS:                                        |        |        |
| Year-on-year self-decarbonization of the benchmark                               | At least 7% on average per annum: in line with or beyond the decarbonization trajectory from the IPCC's 1.5°C scenario (with no or limited overshoot) |        |
| Minimum green share/brown share ratio compared to investable universe (voluntary)| At least equivalent | Significantly larger (factor 4) |
| Exposure Constraints                                                              | Minimum exposure to sectors highly exposed to climate change issues is at least equal to equity market benchmark value |
| Corporate Target Setting                                                          | Weight increase shall be considered for companies which set evidence-based targets under strict conditions to avoid greenwashing (see Article 9 in section 5.12 re conditions) |
| Disqualification from label if two consecutive years of misalignments with trajectory | Immediate |

In brief, the use of a “carbon budget”:

- Either -50% or -30% carbon intensity reduction;
- Followed by a 7% yearly reduction.
PAB Analysis: Time Challenge

- PAB methodology is not sensitive to the date of implementation.

- Although if this methodology would be implemented in 2030, it would increase the emission by 125%.

- Thus the -50%/-7% should be realigned based on the date of inception.