

# Net-Zero Portfolio Alignment

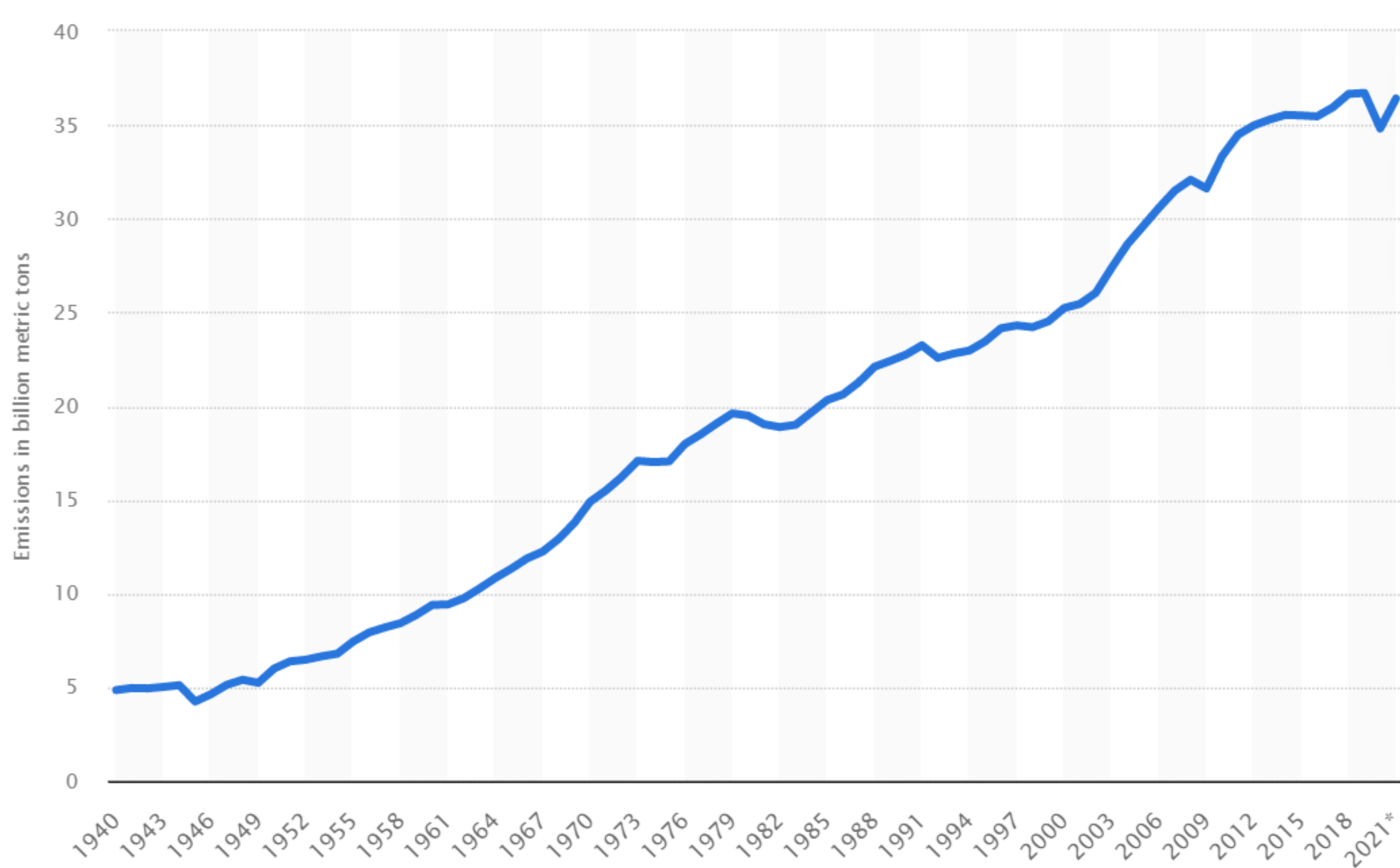
Patrick Bolton, Imperial College

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**ECGI** Capitalism Revisited | Responsible Investment Conference  
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# Government Failure to act on climate change and the rise of ESG

## Annual CO2 emissions worldwide from 1940 to 2021



Source: <https://www.statista.com/statistics/276629/global-co2-emissions/>

# Government failure to act on climate change and the rise of ESG

- The failure of government in addressing the climate crisis and other environmental problems caused by economic growth (air and sea pollution, biodiversity loss) **largely explains the rise in ESG**
- Investors can no longer just focus on making money, leaving environmental and social issues to politics
- The ESG movement started 20 years ago and has grown from a niche to **\$130 trillion** of assets under management, representing 40% of global financial assets associated, with the creation of the Glasgow Financial Alliance for Net Zero (**GFANZ**) launched by Mark Carney at the COP26

# Climate Finance is a risk-management problem

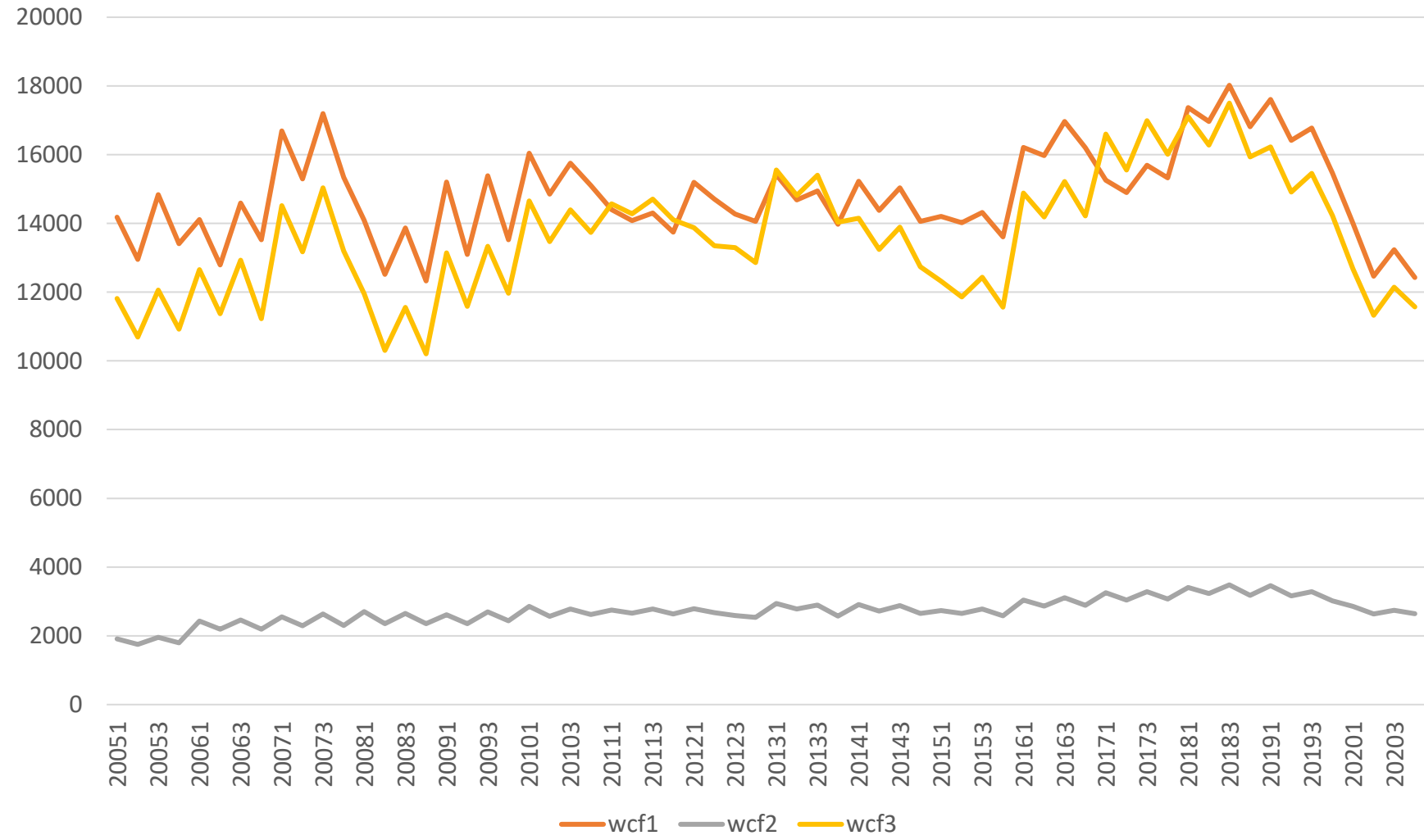
- Taking account of climate change risk means three things for investors:
  1. Investors will seek to **hedge** climate change risk by reducing their exposure to this risk.
  2. Investors will demand **compensation** for holding this risk.
  3. Investors will **engage** with companies to induce them to reduce this risk
- Reducing exposure to carbon transition risk—a form of divestment—is justified based on prudent risk management

# Net Zero portfolio alignment

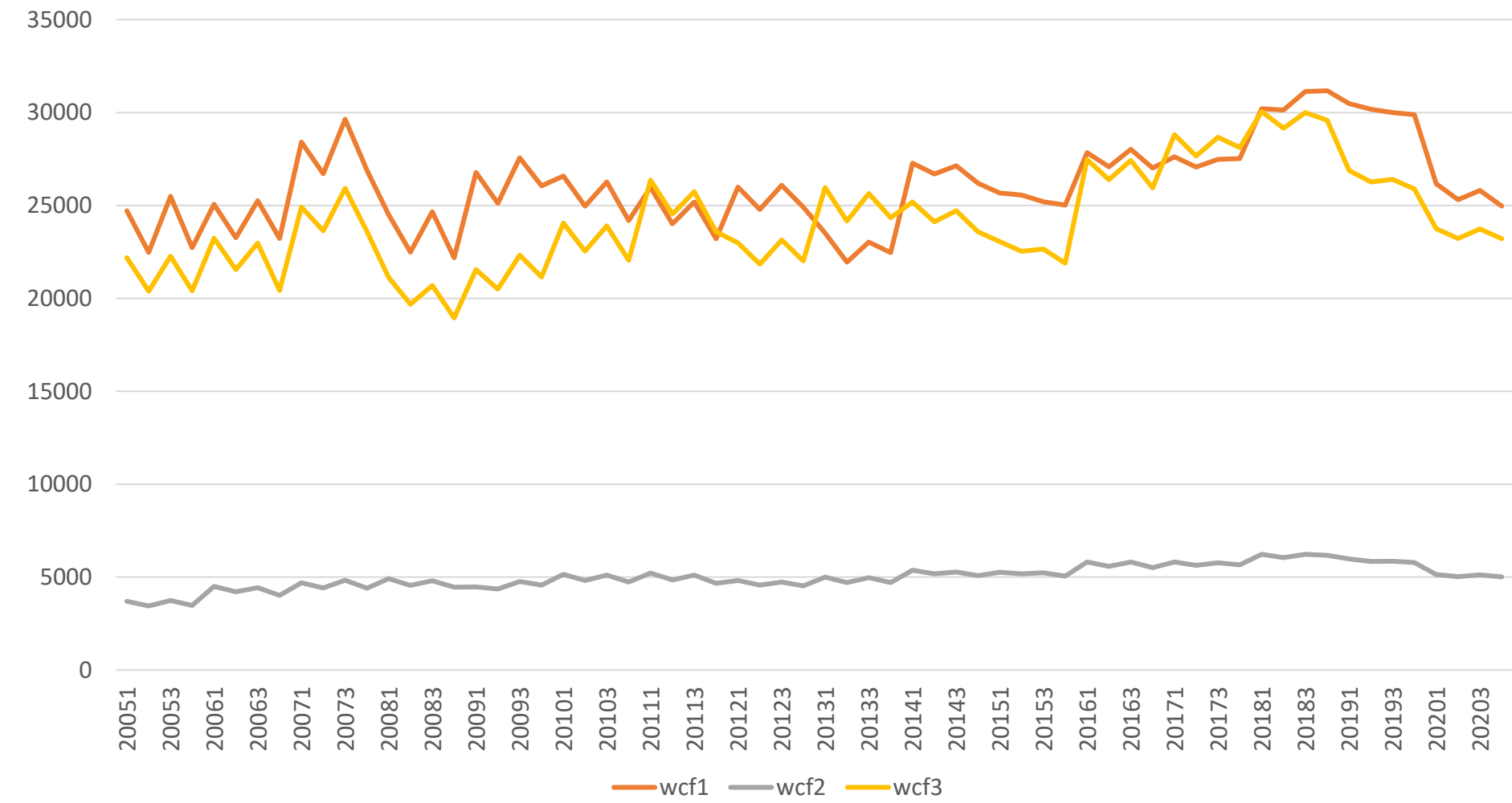
- How should investors manage carbon transition risk?
- Idea: Align the carbon footprint of their portfolios with national net zero commitments
- **UN-convened Asset Owners Net-Zero Alliance** → No concrete portfolio decarbonization methodology
- **Net Zero Asset Managers Initiative** → “commits to support the goal of net zero GHG emissions by 2050”; commits to setting “interim targets for 2030, consistent with a fair share of the 50% global reduction in CO<sub>2</sub>”
- What does this mean?

# Carbon Footprints of Institutional Investors are not aligned with NZ

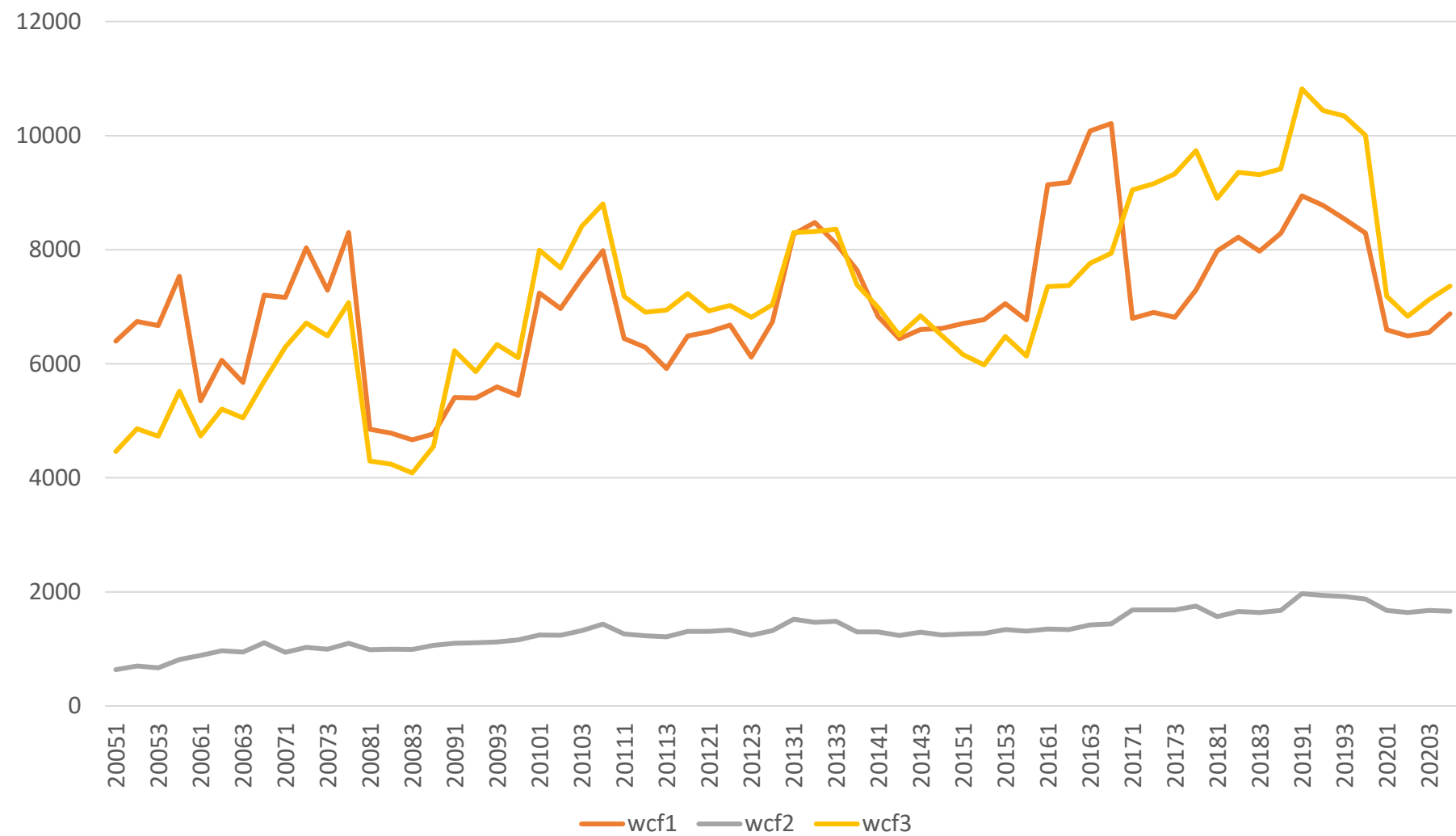
### Average Carbon Footprint: All Countries



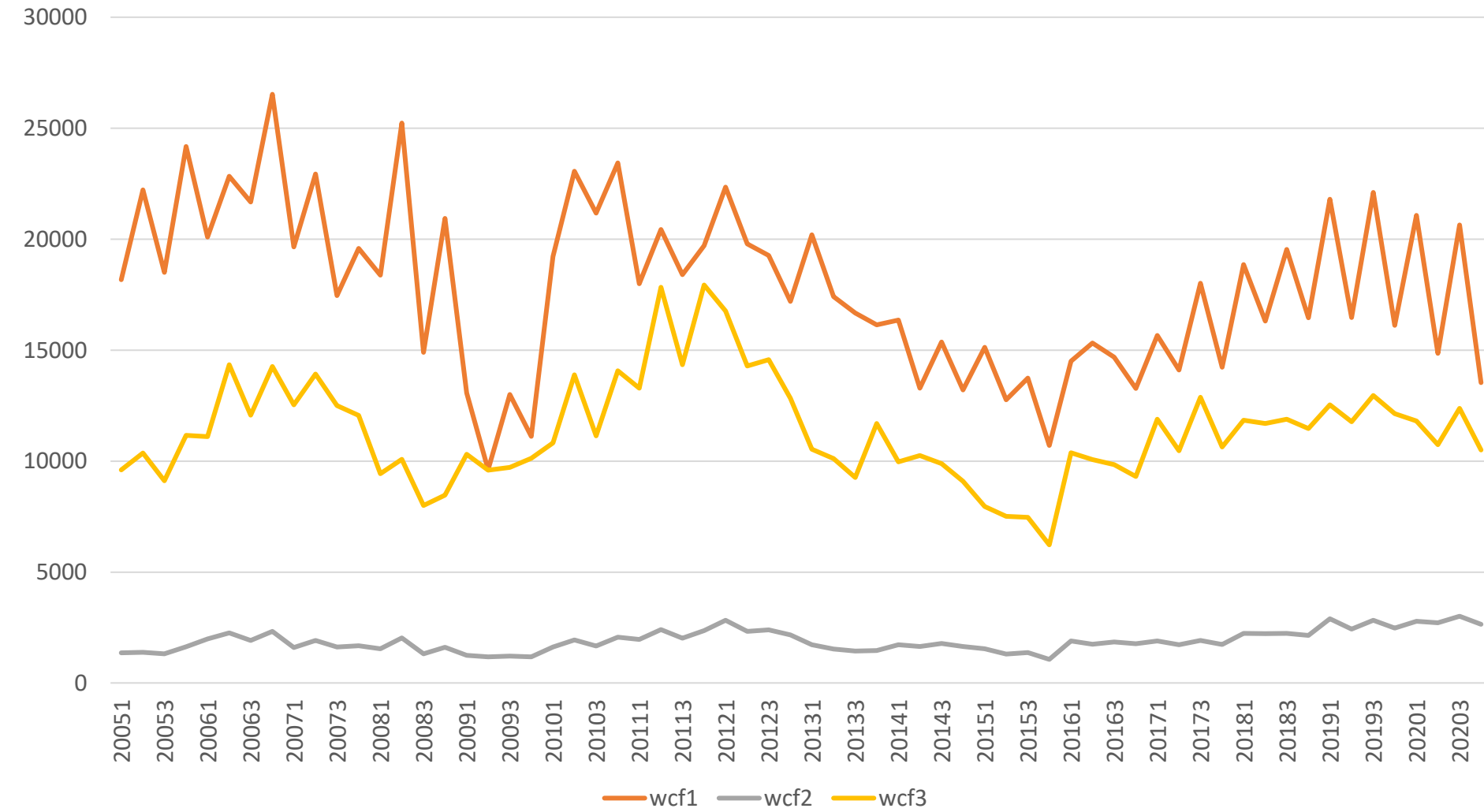
### Average Carbon Footprint: North America



### Average Carbon Footprint: Europe



### Average Carbon Footprint: Asia



# Net Zero portfolio alignment

- In a new article *Net-Zero Carbon Portfolio Alignment* together with Marcin Kacperczyk and Frederic Samama we propose a dynamic alignment strategy anchored around major market indices (<https://ssrn.com/abstract=3922686>)
- **Our perspective:** A well-diversified investor who takes the world as given and who aims to reduce the portfolio carbon footprint to net zero by 2050
- If all companies in the portfolio are NZ-aligned, then the portfolio is also NZ-aligned
- **If companies in the portfolio are not on a NZ pathway the portfolio will have to be adjusted to remain NZ-aligned**
- How to make that adjustment while preserving benefits from diversification?  
(In industry parlance maximizing diversification is equivalent to minimizing **tracking error (TE)** with a market index)

# Net Zero portfolio alignment

- What does it mean for the portfolio to be NZ-aligned?
- **Carbon Budget:** To limit warming to 1.5°C with an 83% probability a maximum total amount of **300Gt of CO<sub>2</sub>** can be emitted as of 2020.
- IEA estimated global annual energy-related emissions at **31.5 GtCO<sub>2</sub>** in 2020
- In 2021 the remaining carbon budget amounts to approximately **268.5 GtCO<sub>2</sub>**
- **Idea: carbon footprint of the portfolio must shrink along with the planet's shrinking carbon budget**



# Net Zero portfolio alignment

## Portfolio footprint:

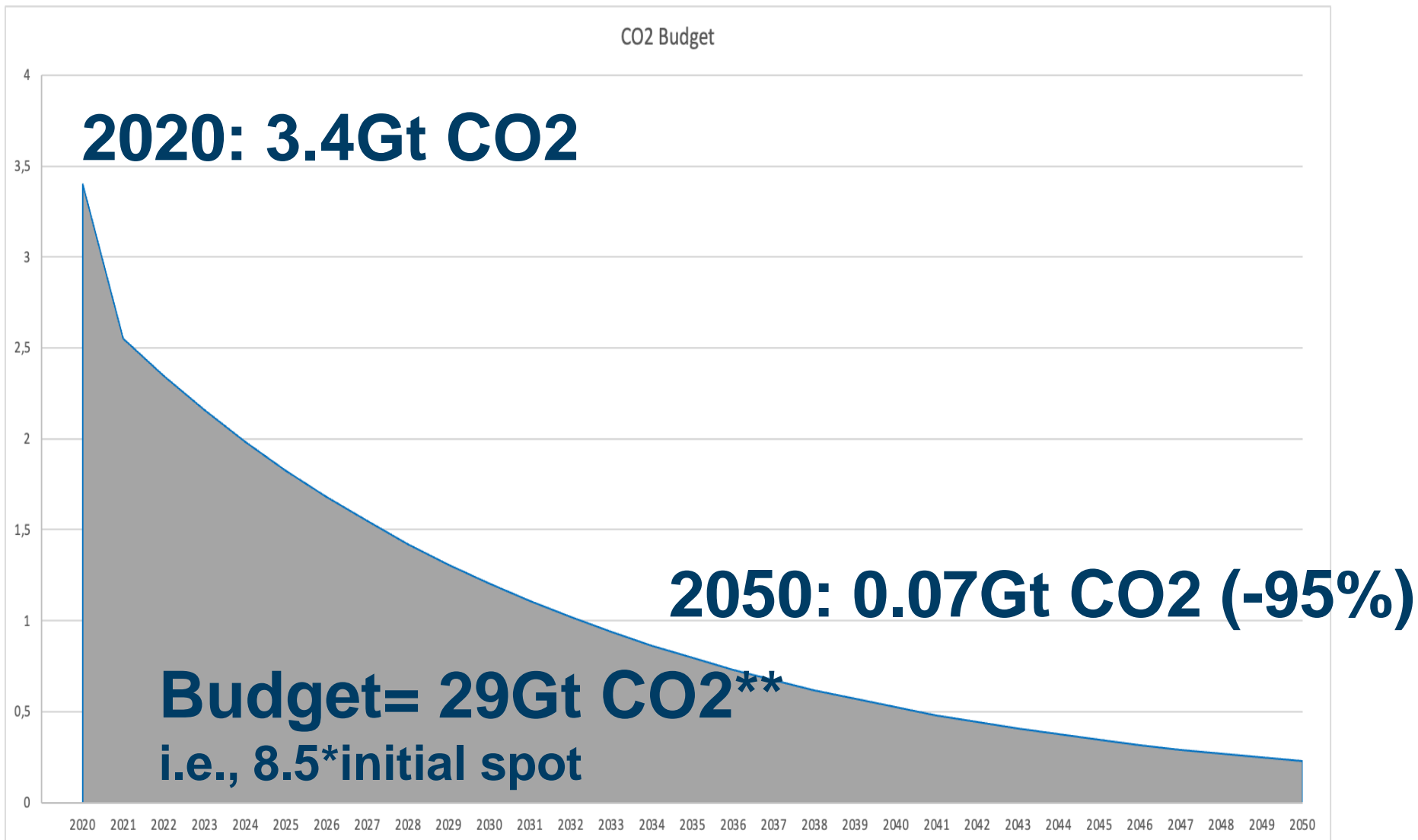
- Emissions of constituent companies multiplied by weights of individual stocks in the portfolio
- Portfolio is dynamically constructed so that the carbon footprint shrinks at a rate that is aligned with NZ
- **Reduction trajectory** of the initial carbon footprint is assumed to follow a constant geometric reduction rate of **8%** until 2050 following an initial **25%** reduction at implementation
- Portfolio optimization is constrained by sector allocations that do not deviate by more than +/- 2% from current benchmark sector weights
- Maintain diversification (optimize TE) by rebalancing the stocks in the portfolio subject to a **carbon budget constraint**.

# Net Zero portfolio alignment

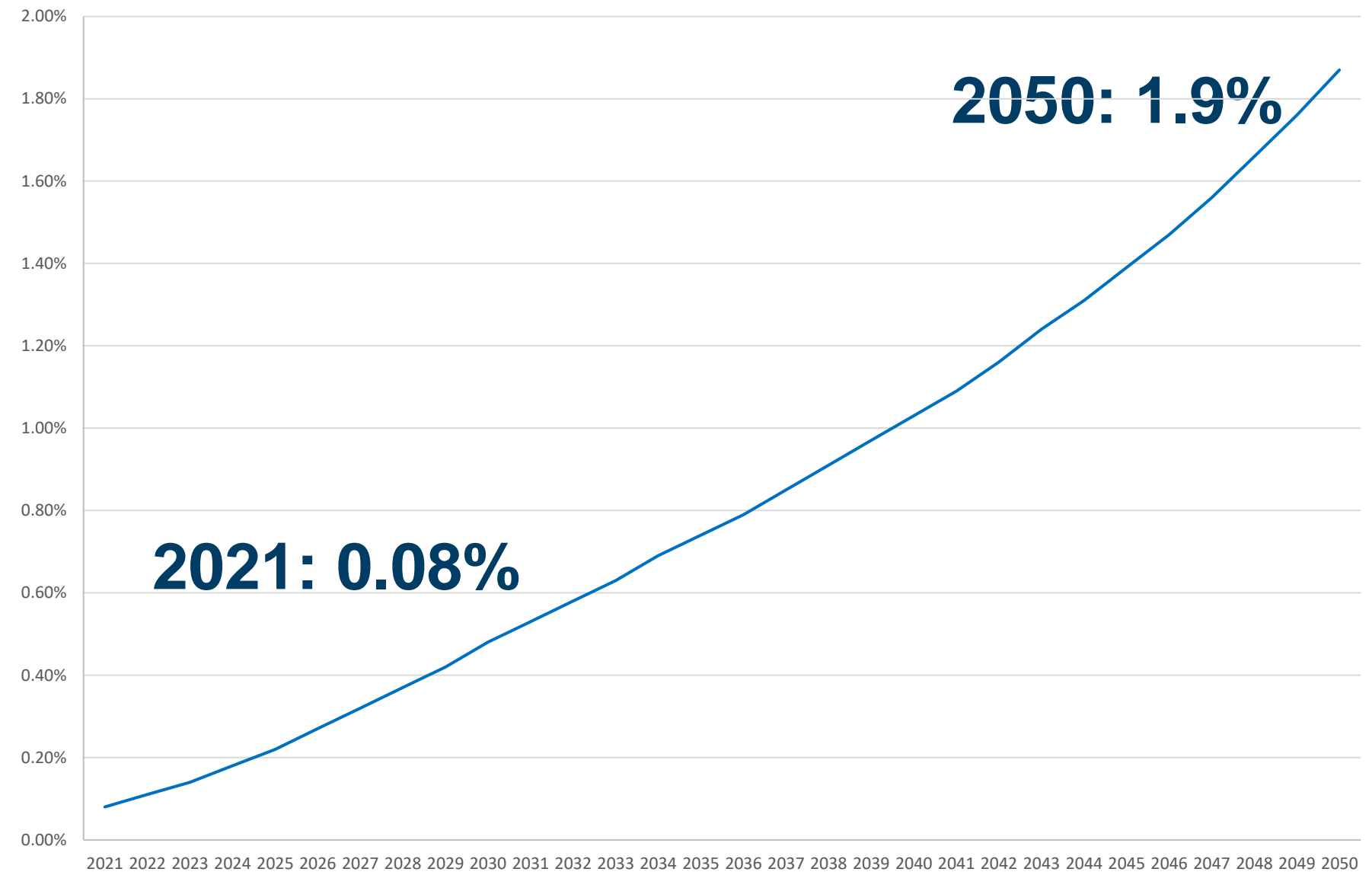
- Ex-ante tracking error (TE) is given by the estimated standard deviation of returns of the decarbonized portfolio from the benchmark—MSCI EUROPE—using a multifactor model of aggregate risk (BARRAONE RISK MODEL)
- **Baseline assumption:** underlying emissions of constituent companies remain constant
- **Main takeaway:** NZ alignment can be achieved for large portfolios (**1 trillion Euros**) while keeping under-diversification risk to a minimum (TE with respect to **MSCI Europe** goes from 0.08% in 2021 to 1.9% in 2050).
- Results are similar when we use the **MSCI World** or **MSCI EM** benchmarks (TE starts at a low level of 0.02% in 2021 and remains below 1% until 2050; MSCI EM: TE also remains low and attains 0.66% in 2050)

# Baseline Scenario (1 trillion in MSCI Europe)

## CO2 Emissions



## Tracking Error



### – 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;
- starting from .08% in 2021, ending at 1.90% in 2050 (below 1% until 2040).

• Estimated with BARRAONE risk model

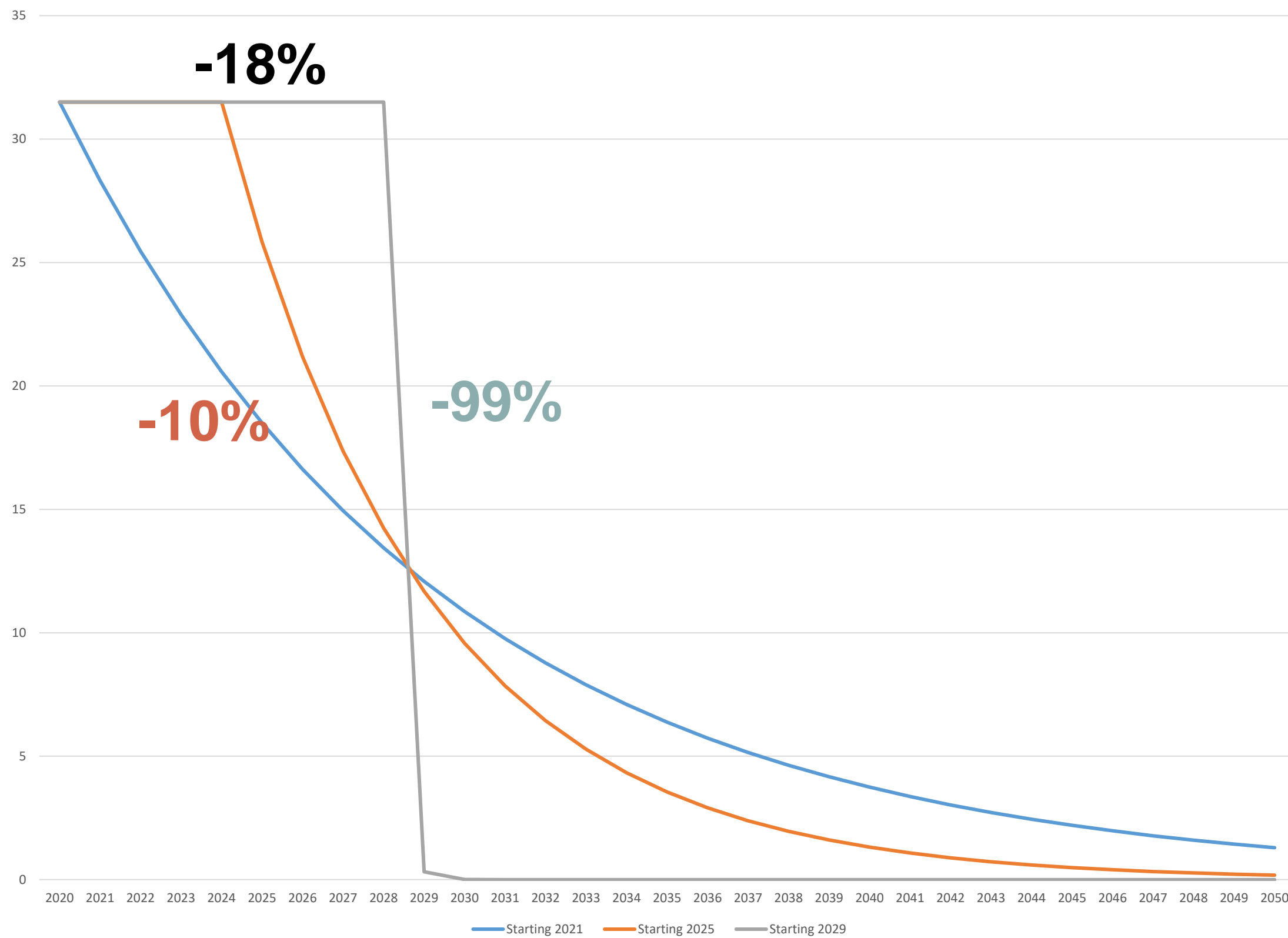
\*\* Final target of 2Gt CO2 rather than 0 to avoid finishing with an empty portfolio.

# A Form of Active Engagement

|             |             |                       |                      |             |             |                       |                   |             |  |
|-------------|-------------|-----------------------|----------------------|-------------|-------------|-----------------------|-------------------|-------------|--|
| OMV AG      | REPSOL SA   | TENARIS SA<br>ENI SPA | GALP ENERGIA SGPS SA | BP PLC      | EQUINOR ASA | ROYAL DUTCH SHELL PLC | TOTAL ENERGIES SE | NESTE OYJ   | KONINKLIJKE VOPAK NV<br>LUNDIN ENERGY AB |
| <b>2021</b> | <b>2022</b> | <b>2023</b>           | <b>2024</b>          | <b>2030</b> | <b>2031</b> | <b>2035</b>           | <b>2039</b>       | <b>2047</b> | <b>2049</b>                              |

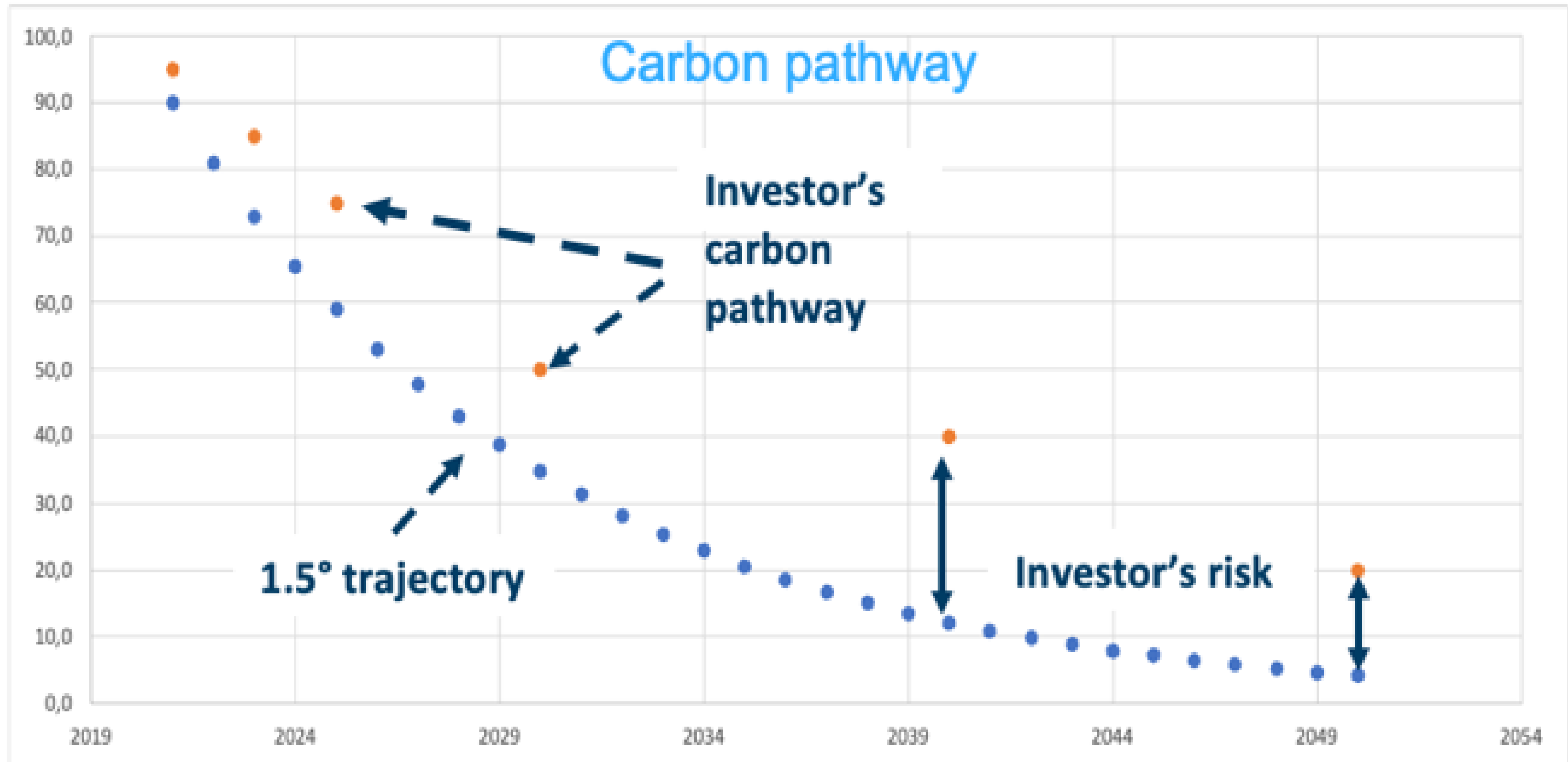
**Energy exit roadmap from Portfolio based on MSCI Europe**

# Impact of Time (MSCI Europe)



- The more we wait, the more we consume the 300GtCO<sub>2</sub> budget, and the less time we have to adjust the portfolio.
- In 2021, a 10% per annum reduction based on the initial CO<sub>2</sub> level achieves NZ.
- In 5 years from now the annual rate of reduction required almost doubles.
- By 2029, it becomes impossible.

# Carbon Pathway and Transition Risk for Investors



# S&P Net Zero 2050 Carbon Budget Index Series

- Sept. 8, 2022: **S&P Dow Jones Indices** announced the launch of a new family of climate-focused market benchmarks called the **S&P Net Zero 2050 Carbon Budget Indices**
- The indices within this suite allocate and adjust a carbon budget across their constituents based on the year of the indices' launch
- The series of 2022 vintage indices have an initial 25% cut in volumes of emissions as well as approximately 10% yearly emissions reduction
- Provides an alternative tool and index-based approach to measure climate and environmental-related risks and returns in investment portfolios
- **Richard Mattison, President of S&P Global Sustainable:**  
*It is essential that investors have access to simple, transparent and scalable tools to support their decision making, and we are proud to be launching this new series of indices to support investors in navigating the transition to a sustainable future.*

# S&P Net Zero 2050 Carbon Budget Index Series

- The equity securities in the S&P Net Zero 2050 Carbon Budget Indices are selected from an underlying universe of broad-market parent indices including the **S&P 500**, **S&P Global BMI**, **S&P Europe BMI**, **S&P Developed BMI** and **S&P Emerging BMI**.
- The S&P Net Zero 2050 Carbon Budget Indices are rebalanced annually. At each annual rebalance, the most up-to-date carbon emissions of the companies will be used to achieve the decarbonizations required while minimizing sector deviations. At launch the indices remain broadly invested with low tracking error relative to their parent indices.
- **Time urgency of the net zero challenge:** In future index launches, the -10% annual decarbonization required will increase with time as the carbon budget gradually shrinks.
- For 2022, this maiden S&P Net Zero 2050 Carbon Budget Indices launch includes:
  - S&P Global Net Zero 2050 Carbon Budget (2022 Vintage) Index
  - S&P 500 Net Zero 2050 Carbon Budget (2022 Vintage) Index
  - S&P Europe Net Zero 2050 Carbon Budget (2022 Vintage) Index
  - S&P Emerging Net Zero 2050 Carbon Budget (2022 Vintage) Index
  - S&P Developed Net Zero 2050 Carbon Budget (2022 Vintage) Index
- Methodology is published and available at S&P Dow Jones Indices' website: <https://www.spglobal.com/spdji/en/>.



## Conclusion

- Climate Finance is a risk-management problem
- The greater the deviation of the portfolio carbon footprint from a NZ footprint the greater the transition risk exposure of the portfolio
- Time is itself a risk factor because the longer alignment is delayed the greater is the transition risk exposure
- **Good risk management means aligning portfolios with NZ goals**