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Paris-Aligned Benchmarks (PABs) Explained

FOR PROFESSIONAL INVESTORS ONLY

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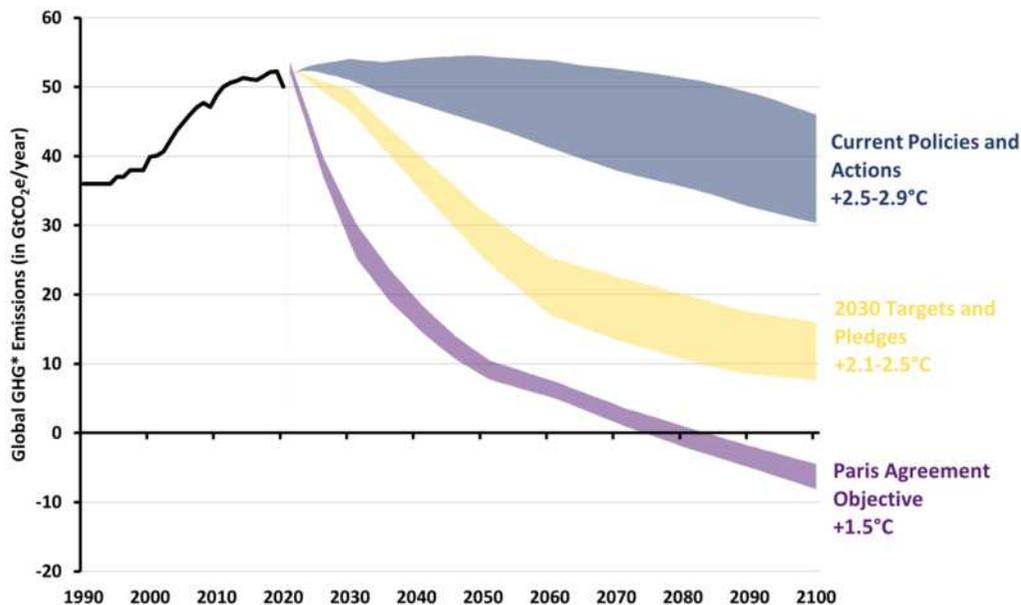


INTRODUCTION

Walking the net-zero path

The climate emergency and its implications forced the asset management industry to develop multiple approaches that aim to address these issues.

Emissions and Warming Projections by 2100



Source: Climate Action Tracker Projections as of December 2023

As a result, the number of options available to investors looking for climate-oriented solution is large and heterogeneous. A common way to address climate change in portfolios construction is the low carbon approach, which consists in targeting quantifiable reductions in carbon intensity and/or carbon footprint while investing in all sectors. Yet, focusing only on carbon footprint has proved a limited solution, as it is not forward-looking, addresses only the current situation, and gives no information about long-term trajectory. Other climate-oriented solutions therefore concentrate their investments to specific sectors that would contribute to a net zero economy (for example, green energy/tech. funds), or instruments with specific outcomes (for example, green bonds). Yet again, these approaches can fail to meet investors' needs for diversification and to address the real issue: finding solutions to change the economy globally towards net zero, as investing only in green stocks and sectors will not be sufficient. In parallel, the regulation on ESG evolves rapidly, and fuels the continuous adaptation of investment approaches.

With all these moving forces, investors may have lack of clarity when it comes to align effectively their investments with the objective of a net-zero economy. For sustainable finance, the objective is clearly defined, but the investment path is way more difficult to achieve. Therefore, the European Commission established in 2016 a High-Level Expert Group to help developing a comprehensive EU roadmap on sustainable finance. The result was the Delegated Act in 2020, and the definition of a new generation of climate indices in the equity and fixed income space, with the creation of "Paris-Aligned Benchmarks" (PAB) and Climate Transition Benchmarks ("CTB").

The European Commission's objective is to encourage capital deployment from passive management towards indices whose trajectory is compatible with the decarbonization of the economy promoted by the Paris Agreements. These indices will also allow to measure the performance of actively managed funds with a strong climate ambition.



Paris-Aligned Benchmarks vs. Climate Transition Benchmarks

By construction, PABs indices are more ambitious than the CTBs, as they have higher carbon intensity reduction targets and sector exclusions that target fossil fuels (oil, coal, natural gas, etc.).

The minimum requirement that these indices must meet are summarized in the following table:



	Climate Transition Benchmark (CTB)	Paris-Aligned Benchmark (PAB)
Carbon intensity reduction vs. initial investment universe	At least - 30%	At least - 50%
Annual decarbonation rate of the index	At least 7% annual reduction of the index carbon intensity. This trajectory allows to be aligned with the IPCC's 1.5°C scenario.	
Exposure to carbon intensive sectors	At least equivalent to the exposure of the investment universe. The objective is to avoid "replacing" high carbon intensive sectors by low carbon intensive sectors.	
Scope 3 emissions data integration	At least equivalent to the exposure of the reference universe. <ul style="list-style-type: none"> • Since launch: integration of energy and mining sector. • Within 2 years: transportation, construction, building, materials, and industrials sectors. • Within 4 years: all other sectors 	
Exclusions	ESG Exclusions: tobacco, controversial weapons and societal norms violators.	ESG Exclusions: tobacco, controversial weapons, societal norms violators, climate exclusions (% of revenues for each company): <ul style="list-style-type: none"> • Coal (1%) • Oil (10%) • Natural gas (50%) • Electricity generation with a carbon intensity above 100gCO2/kWh (50%)

Source: Ossiam.



Why PABs matter ?

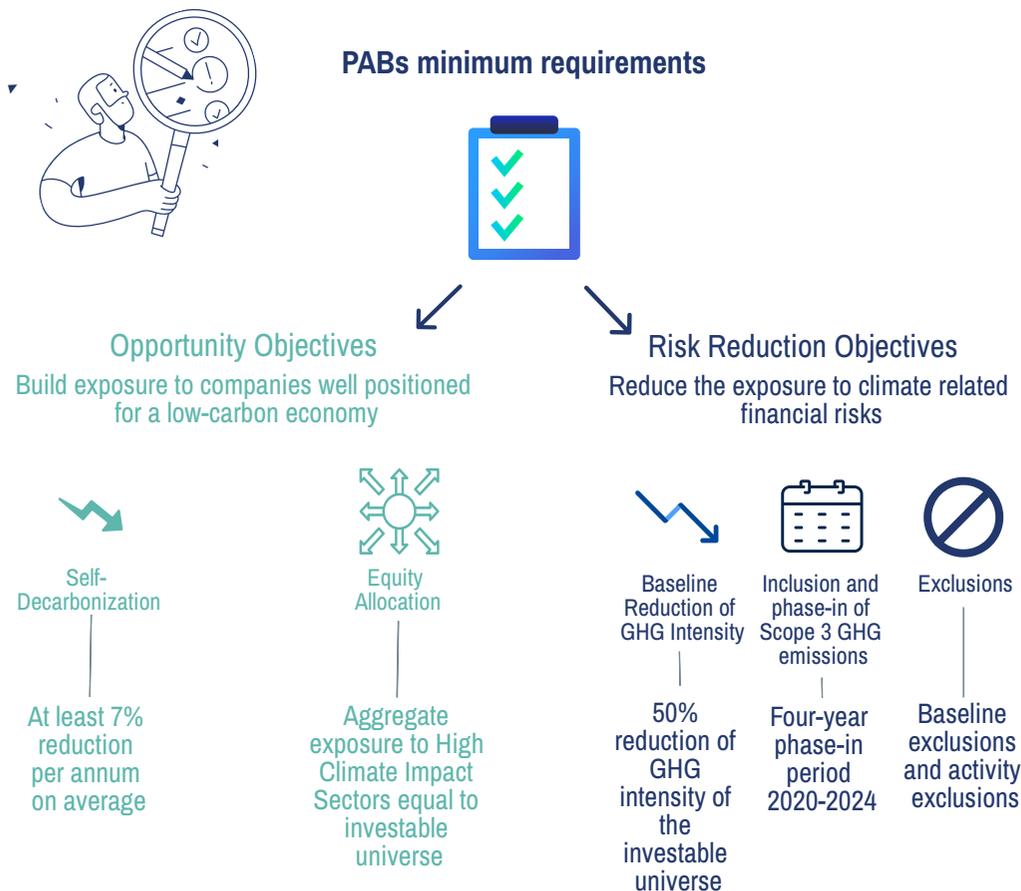
Introduction

The framework that governs PAB relies on a set of rules defined by the EU Delegated Act that balances:

- “opportunity objectives”, i.e., being exposed to companies that will benefit from a low carbon economy, with
- “risk reduction objectives”, i.e., reducing the exposure to climate related financial risks

PABs minimum requirements are summarized below:

Figure 1: Minimum requirements of PABs set by the European Commission



Why PABs go beyond low carbon approaches

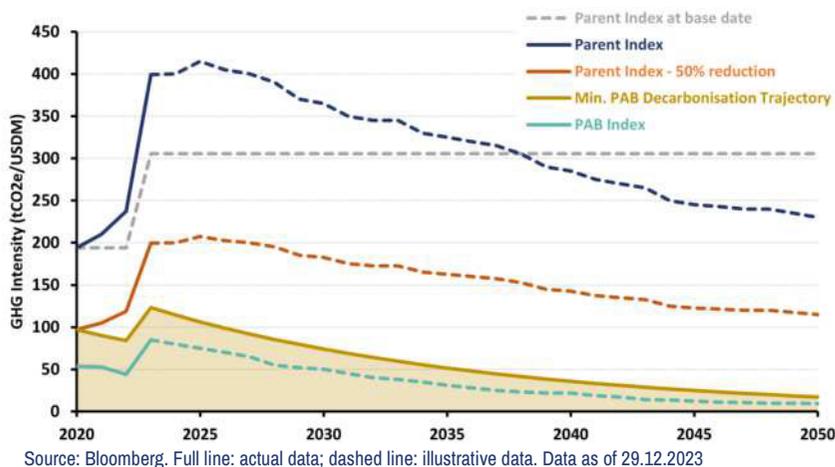
The carbon metrics used by PABs are based on GHG intensity, calculated as Total GHG Emissions/EVIC (Enterprise Value Including Cash) and expressed as tCO₂e/USDm. Scope 3 emissions are gradually included in the GHG intensity calculation for certain sectors.

Like traditional low carbon approaches, PABs aim, among other things, to reduce carbon intensity relative to their benchmarks. We illustrate below the different steps to achieve carbon reduction in a PAB compared to the Bloomberg Global Developed Market Large & Mid Cap Index (the "Parent Index"):

In 2020, the carbon intensity of the Parent Index was at 194.

- The first requirement for an index to be labeled as PAB is to reduce by at least 50% the carbon intensity compared to the Parent Index (the "Baseline GHG Intensity Reduction"). Therefore, the carbon intensity of a PAB in 2020 must be below 97 and must remain below 50% of the Parent Index's intensity afterwards.
- The second requirement is the "Decarbonization Trajectory": the PAB must reduce by at least 7% the carbon intensity year-on-year. This ensures that the portfolio invested by the PAB will see its intensity reduced each year to reach net zero by 2050. This is represented by the yellow line in the chart below.

Figure 2: Illustration of the decarbonization trajectory (GHG Intensity in tCO₂e/USDm) with developed markets index



One can notice that the actual intensity of the Parent Index since 2020 has increased, mainly because of the inclusion of scope 3 emissions, but also due to higher GHG emissions in absolute term. It means that a traditional low carbon index, even if it reduces the intensity by 50% versus the universe, would also have seen its emissions increase (orange line).

The adverse scenario could not take place with a PAB: regardless of the evolution of the intensity of the starting universe, the PAB needs to follow its trajectory and reach net zero in 2050.



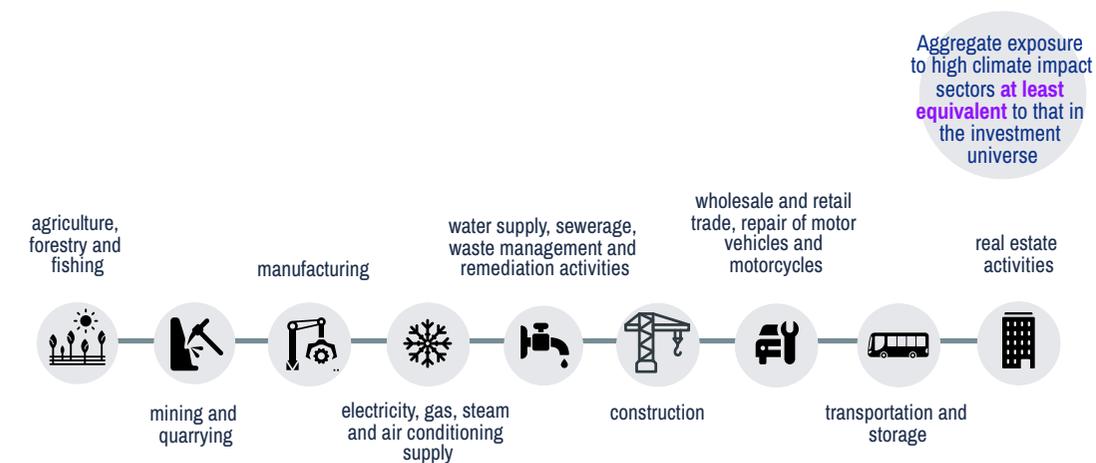
Transition vs. exclusion

One can rightly state that such reduction in carbon intensity could easily be achieved by excluding certain high climate impact sectors ("HCIS", such as transportation or agriculture) from the investment portfolio.

The PAB regulation acknowledges that the transition to a net zero economy takes time, as the lifestyle of humankind will probably not change in a day. Therefore, the aim of PABs is to foster changes among companies in all economic sectors rather than shift investment flows toward the less carbon intensive businesses. To ensure that the whole economy is engaged towards the objective of complying with the 1.5°C scenario, the PAB regulation sets that the average weight of the HCIS must be the same in the PAB compared to the Parent Index.

This constraint, combined with the Decarbonization Trajectory, guarantees that PABs select stocks inside those HCIS that make a difference and provide solutions to tackle climate change.

Figure 3: High climate impacts sectors invested within PAB indice



Source: European Commission, Ossiam.



PAB providers: Same foundation, different designs... with different effects

Introduction



All PABs are governed by a common framework with minimum requirements defined by the EU Delegated Acts. However, the details of the methodology remains at the discretion of the index providers.

At Ossiam, we believe PABs were designed by the EU commission to be core holdings for investors. Therefore, it is important that PAB indices remain as close as possible to mainstream market cap indices while meeting its minimum requirements. This is not the case of all PABs indices, with some taking different routes through the addition of non-mandatory criteria.

In this section, we provide illustrations of the impacts that the different methodology can have on portfolios. We limit our analysis to Bloomberg and MSCI indices, which are the underlying indices of the largest European PAB ETFs. Considered indices focus on US equities, and data is used from April 2020 to December 2023 (i.e., maximum common data).

Figure 1: Universe of analysis

PAB Index

Bloomberg PAB US Large & Mid Cap Index

MSCI USA SRI Filtered PAB Index

MSCI USA SRI S-Series PAB 5% Capped Index

MSCI USA ESG Climate PAB Select Index Index

Respective tickers

USPABN index

MXUSSXNU index

M1CXUSC index

NU739028 index

Source: Bloomberg, MSCI.



Tracking error

Figure 2 shows the tracking error of the different PAB indices over the full period. Figure 3 shows the 60-days rolling tracking error versus the MSCI USA Index of the different PAB versions.

The result is similar with a long and short-time horizons: the PAB versions of MSCI have a significant higher tracking error than the Bloomberg version.

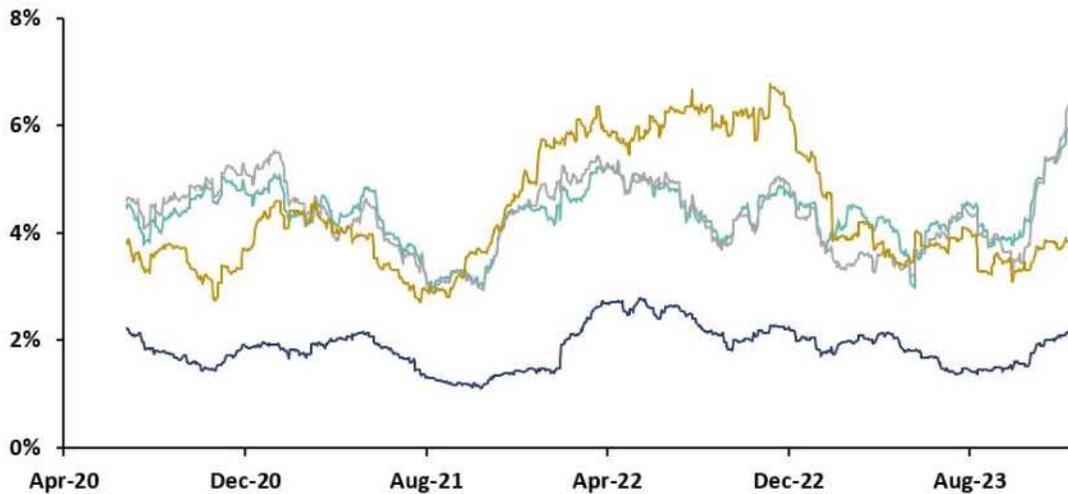
Figure 2: Tracking error of PAB indices vs. MSCI USA Index (06.04.2020 - 29.12.2023)

Tracking error vs. MSCI USA Index

— Bloomberg PAB US Large & Mid Cap Index (USPABN index)	1.93%
— MSCI USA SRI Filtered PAB Index (MXUSSXNU index)	4.42%
— MSCI USA SRI S-Series PAB 5% Capped Index (M1CXUSC index)	4.46%
— MSCI USA ESG Climate PAB Select Index Index (NU739028 index)	4.50%

Source: Bloomberg, MSCI. Past performance does not predict future results.

Figure 3: 60-day rolling tracking error vs. MSCI USA Index (06.04.2020 - 29.12.2023)



Source: Bloomberg, MSCI. Past performance does not predict future results.



Index methodologies

Figure 4 summarizes the key differences in the methodology of the considered PABs.

Figure 4: Key features of PAB index methodology

	Bloomberg PAB US Large & Mid Cap Index	MSCI USA SRI Filtered PAB Index	MSCI USA SRI S-Series PAB 5% Capped Index	MSCI USA ESG Climate Paris Aligned Benchmark Select
PAB Exclusions	✓	✓	✓	✓
GHG Reduction	50%	50%	50%	50%
GHG Trajectory	7%	7%	7%	10%
Additional ESG exclusions	No	Yes	Yes	Yes
Additional ESG inclusion	SBTI / DNSH	No	No	Carbon reduction target
Best in class	No	25% GICS	25% GICS	No
Rebalancing	Semi-Annual	Quarterly	Quarterly	Semi-Annual
Active stock weight	No	+/-2% or 20x vs. SRI Index	+/-2% or 20x vs. Parent Index	+/-2% or 20x vs. Parent Index
Maximum issuer weight	10%	5%	5%	No
Active sector weight	5%	+/-5% vs. SRI Index	+/-5% vs. Parent Index	+/-5% vs. Parent Index

Source: Bloomberg, MSCI, S&P. For illustration purpose only.

The Bloomberg US PAB methodology has been constructed to follow closely the EU PAB requirements. It does not add "ESG best in class filters" or "ESG filters", that are not mandatory. However, it uses the SBTI (Science Based Target Initiative) to overweight companies setting and respecting carbon reduction targets in line with the Paris Agreement on climate as well as DSHS principle ("Do No significant Harm") to ensure that the Bloomberg PAB index scores at least as much as the parent index on the 6 EU environment objectives.

On the contrary, the MSCI USA SRI Filtered PAB (green) adds further ESG exclusions, which are not required by the EU. It also implements an ESG best in class filter to select, in each GICS sub-sector, only the 25% best rated stocks. Another key point is that the optimization has diversification constraints versus the SRI version of the MSCI USA and not the parent index (MSCI USA). This means that there can be high stock or sector bias versus the parent index. The MSCI USA SRI S-Series PAB 5% (grey) is very similar to the MSCI USA SRI Filtered PAB we just described. The main differences are that the best in class is done at the GICS level and that the optimization diversification constraints are versus the MSCI USA directly. The MSCI USA ESG Climate Paris Aligned Benchmark Select (yellow) is closer to the Bloomberg version, as it does not exclude additional sub sectors not mentioned by the EU PAB Requirements, and it also includes a filter to encourage companies setting and respecting carbon reduction targets. The optimization constraints for this version are calibrated versus the parent index.



Portfolio composition

The differences in methodologies result in differences in portfolio compositions, and it is important for investors to clearly understand those implications when selecting a PAB solution.

Figure 5: Number of stocks of PAB indices

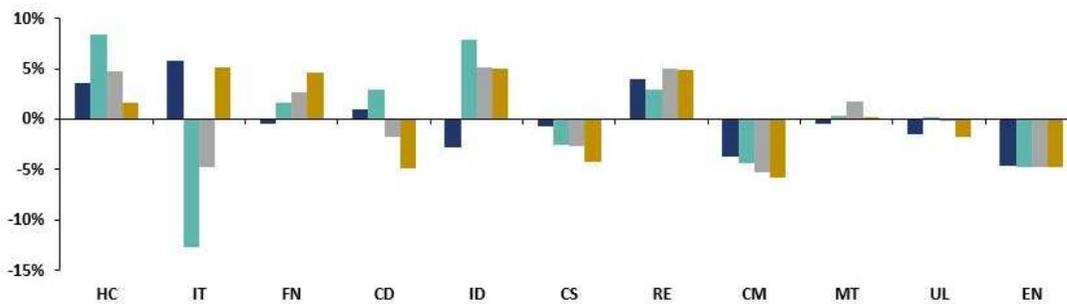
Index	Number of stocks
Bloomberg PAB US Large & Mid Cap Index (USPABN index)	484
MSCI USA SRI Filtered PAB Index (MXUSSXNU index)	125
MSCI USA SRI S-Series PAB 5% Capped Index (M1CXUSC index)	118
MSCI USA ESG Climate PAB Select Index Index (NU739028 index)	198

Source: Bloomberg, MSCI, S&P. As of 29.12.2023



Figure 6 shows the active sector weights versus the MSCI USA Index.

Figure 6: Active sector weights of PAB indices vs. MSCI USA Index



Source: Bloomberg, MSCI, S&P. As of 29.12.2023. MT: Materials - CS: Consumer Staples - CD: Consumer Discretionary - FN: Financials - HC: Health Care - ID: Industrials - EN: Energy - RE: Real Estate - CM: Communication Services - IT: Information Technology - UL: Utilities

The Bloomberg PAB US has smaller deviation compared to the MSCI PAB versions, in particular compared to the MSCI USA SRI Filtered PAB (as mentioned, constrained versus the MSCI USA SRI Index). The deviation in the IT sector is very important as this PAB version has an active underweight of more than 10%.

Figure 7: Top 10 of PAB indices vs. MSCI USA Index

Bloomberg PAB US Large & Mid Cap Index

Index	MSCI USA Index	Δ (absolute)	
Apple	6.9%	7.2%	0.3%
Microsoft	6.5%	6.3%	0.2%
Amazon	3.3%	3.4%	0.1%
NVIDIA	2.8%	2.9%	0.2%
Tesla	1.7%	1.7%	0.0%
JP Morgan	1.3%	1.2%	0.2%
Eli Lilly & Co.	1.2%	1.1%	0.1%
UnitedHealth	1.2%	1.2%	0.0%
Broadcom	1.1%	1.2%	0.0%
Visa	1.1%	1.0%	0.1%
Total	27.1%	27.0%	1.1%

MSCI USA SRI Filtered PAB Index

Index	MSCI USA Index	Δ (absolute)	
Tesla	4.9%	1.7%	3.2%
Microsoft	4.5%	6.3%	1.8%
Home Depot	3.8%	0.8%	2.9%
Adobe	3.2%	0.7%	2.5%
Texas Instrument	2.7%	0.4%	2.3%
Danaher Corp	2.6%	0.4%	2.2%
Prologis	2.4%	0.3%	2.2%
Verizon Comm.	1.9%	0.4%	1.5%
Intuit	1.9%	0.4%	1.5%
AMGEN	1.8%	0.4%	1.5%
Total	29.6%	11.7%	21.6%

MSCI USA SRI S-Series PAB 5% Capped Index

Index	MSCI USA Index	Δ (absolute)	
Texas Instrument	5.1%	0.4%	4.7%
Microsoft	4.6%	6.3%	1.7%
Prologis	3.1%	0.3%	2.8%
Adobe	2.7%	0.7%	2.1%
NXP Semiconducto	2.7%	0.1%	2.6%
Intuit	2.7%	0.4%	2.2%
LAM Research Corp	2.4%	0.3%	2.1%
Autodesk	2.3%	0.1%	2.2%
Tesla	2.3%	1.7%	0.6%
Zoetis	2.1%	0.2%	1.9%
Total	29.9%	10.5%	22.9%

MSCI USA ESG Climate Paris Aligned Benchmark Select

Index	MSCI USA Index	Δ (absolute)	
Microsoft	6.7%	6.3%	0.4%
NVIDIA	3.9%	2.9%	1.0%
Alphabet	2.7%	1.8%	0.9%
Broadcom	2.4%	1.2%	1.2%
Sherwin Williams	2.1%	0.2%	1.9%
Visa	2.1%	1.0%	1.1%
Equinix	1.9%	0.2%	1.8%
Analog Devices	1.9%	0.2%	1.6%
Digital Realty Trust	1.8%	0.1%	1.7%
Eli Lilly & Co.	1.8%	1.1%	0.7%
Total	27.2%	15.0%	12.3%

Figure 7 shows the top 10 holdings of the considered PABs. The table shows that the Bloomberg PAB index shows less diversification than MSCI PAB indices. This fuels again the tracking error.



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