

# Paris-Aligned Benchmark ETFs: A performance and climate alignment review

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With 60% of emissions released by entities not listed on equity markets, the decarbonisation of fixed income portfolios is critical if we are to address global warming.<sup>1</sup> Nearly a third of debt capital is invested through passive products,<sup>2</sup> thus the potential impact of transitioning these portfolios is huge.<sup>3</sup> Introduced in 2019 by the European Union (EU), the Paris-Aligned (PAB) and Climate Transition Benchmarks (CTB) labels set clear parameters for aligning passive investments with global climate goals.

Equities have so far attracted the lion’s share of PAB/CTB product offerings with most fixed income flows driven by EUR corporate bonds. Growth beyond this narrow focus is needed if passive fixed income is to achieve climate alignment on a global scale.

To support the development of climate-aligned products in the fixed income space, we examine four examples of PAB Exchange Traded Funds (ETFs). We consider the challenges and opportunities that they present to investors.

Figure 1 provides an overview of some of the PAB label’s parameters. We find that complex benchmark construction is needed to meet these requirements, leaving investors with significant sector biases and a lack of transparency around the security selection and

Figure 1. High-level overview of PAB requirements. Source: Bloomberg.

Climate Scenarios	Self-Decarbonization	Relative Decarbonization	Exclusions
IPCC 1.5° With limited to no overshoot	-7% Year-on-year reduction in GHG emissions intensity	-50% Minimum reduction in GHG emissions relative to parent index	<ul style="list-style-type: none"> <li>× DNSH</li> <li>× Controversial weapons</li> <li>× United Nations Global Compact (UNGC) violations</li> <li>× Tobacco</li> <li>× Fossil fuels*</li> </ul>

IPCC: Intergovernmental Panel on Climate Change

weighting process. While PABs boost indices’ comparability and standardisation, investors should also be aware of the substantial implementation differences we find across providers.

It is the case that **PAB investment products deliver substantial climate enhancement without compromising performance.** However, we suggest that **“best-in-class” climate strategies are simpler to implement and potentially deliver similar climate outcomes.**

<sup>1</sup> “[Listed Company Emissions](#)”, Generation IM, 11 Oct 2021.

<sup>2</sup> “[Passive likely overtakes active by 2026](#)”, Bloomberg, 11 Mar 2021.

<sup>3</sup> For analysis of the climate impact of the LQD passive bond ETF see “[Decarbonising iShares’ LQD ETF](#)”, AFII, 15 Dec 2022.

# Introduction Paris-Aligned and Climate Transition Benchmarks

The Paris-Aligned Benchmark label was introduced by the EU Technical Expert Group (TEG) on Sustainable Finance in September 2019, alongside Climate Transition Benchmarks.<sup>4</sup> The PAB and CTB labels apply to indices that can be tracked by passive investment products, such as ETFs. Their objective is to provide a set of quantitative carbon reduction goals to deter greenwashing and increase comparability between indices.

Both benchmarks aim to mitigate climate change risks with PABs having stricter demands, including alignment with the Paris Climate Agreement global warming targets (i.e., keep global warming to 1.5°C above pre-industrial levels by 2050).

We provide a (non-exhaustive) overview of PAB and CTB minimum requirements as defined by the EU TEG in Table 1. Although PAB/CTB minimum requirements are outcome-based, it is common practice for index providers to set those as index rules to ensure targets are met.

Table 1. EU TEG's PAB and CTB minimum requirements. Source: EU TEG.

Minimum standards	Climate Transition Benchmark	Paris Aligned Benchmark
<b>Minimum Scope 1+2+(3) Carbon intensity reduction compared to parent index</b>	30%	50%
<b>Scope 3 phase-in</b>	Up to 4 years	Up to 4 years
<b>Baseline Exclusions</b>	Controversial Weapons Societal norms violators	Controversial Weapons Societal norms violators Coal (1%+ revenues) Oil (10%+ revenues) Natural Gas (50%+ revenues)
<b>Activity Exclusions</b>	No	Electricity producers with carbon intensity of lifecycle GHG emissions higher than 100gCO2e/kWh (50%+ revenues)
<b>Year-on-year self-decarbonisation of the index</b>	At least 7% on average per annum	
<b>Minimum green/fossil-fuel revenue ratio</b>	At least equivalent to parent index	>4
<b>Exposure constraints</b>	Minimum exposure to sectors highly exposed to climate change issues is at least equal to equity market benchmark value	
<b>Corporate target settings</b>	Weight increase shall be considered for companies which set evidence-based targets under strict conditions to avoid greenwashing	

<sup>4</sup> “[Final report on EU Climate Benchmarks and Benchmarks’ ESG Disclosures](#)”, European Commission, 30 Sept 2019.

Following the introduction of PAB/CTB, asset managers with the help of index providers launched or converted passive investment products such as ETFs to comply with the labels' minimum requirements. A recent example is the conversion and rebranding of Lyxor's flagship corporate bond ESG ETF, which switched its benchmark to track a PAB-aligned index.<sup>5</sup> In the context of falling fund fees,<sup>6</sup> we surmise that asset managers' enthusiasm is at least partly driven by the higher fees paid for these products.

Appetite has indeed been high. According to ETF Stream, PAB/CTB ETFs now account for over EUR 50bn of AUM.<sup>7</sup> (An unknown amount is also being managed through separately managed accounts).

The products provide investors with comprehensive, well-justified and solid indices.<sup>8</sup> As PAB/CTB are defined by the EU, investors can be reassured that they are aligned with global climate goals as set by a supranational organisation. This also provides a hedge against misalignment criticism.

Table 2. PAB/CTB ETFs - AUM of four of the largest ETF providers. Source: ETF Stream, AFII.

Asset Manager	Total PABs/CTBs (\$Bn)	Fixed Income PABs/CTBs (\$Bn)
Blackrock	>20	0.47
Amundi	19	1.06
BNP	15	4.57
DWS	3.1	3.53

## SFDR categorisation

Looking at the application of the Sustainable Finance Disclosure Regulation (SFDR) to these funds, the situation has changed over time. The lack of clarity during the first phase of categorising funds under SFDR led to a market consensus that, with their solid and comprehensive set of rules, PAB products were fit to comply with Article 9 (commonly known as "dark green" funds).

In its second phase, however, which requires all SFDR fund assets to be invested in environmentally sustainable economic activities, many PAB funds have been re-categorised as Article 8 "light green" funds<sup>9</sup> (despite ESMA's view that they should be Article 9).<sup>10</sup> A plausible reason for this is that while PABs invest in companies with better sustainability profiles than standard indices, they are still broad-based securities market indices exposed to most sectors of the global economy.

## Index construction

Before focusing on a comparative review of a sample of four PAB ETFs, we wish to highlight that PAB/CTB are sophisticated investment products.

They compel indices to comply with a long list of targets that can only be achieved with the use of advanced mathematical techniques such as optimisers. Indices' rules are used as a set of

<sup>5</sup> ["Amundi switches Lyxor corporate bond ESG ETF to Paris-Aligned amid rebrand"](#), ETF Stream, 20 Dec 2022.

<sup>6</sup> ["Fund Fees' Continued Decline Is a Win for Investors"](#), Morningstar, 12 Jul 2022.

<sup>7</sup> ["DWS downgrades 10 Paris-aligned climate ETFs to SFDR Article 8"](#), ETF Stream, 2 Dec 2022.

<sup>8</sup> ["Takeaways related to Key Climate Benchmarks and the Benchmarks' ESG Disclosures"](#), KPMG, May 2020.

<sup>9</sup> ["Passive downgrades drive 'great reclassification' of Article 9 funds"](#), 27 Jan 2023.

<sup>10</sup> ["Paris-aligned climate ETFs should be Article 9, ESMA advisory group says"](#), ETF Stream, 24 Jan 2023.

constraints integrated by the optimiser to find an “optimal solution” (i.e., a portfolio that best complies with PAB/CTB requirements and other constraints such as diversification, etc.)

While the use of optimisers is common practice in the financial industry, they are complex tools coming with assumptions and implementation challenges. To that extent, we believe investors should approach PAB/CTB as sophisticated investment products and challenge index providers’ optimisation methodologies. As an example, we suggest index providers disclose each rule’s impact on the resulting portfolio, individually or combined.

The long list of PAB/CTB targets also requires using large amounts of theoretically flawless data, that, in reality, varies in quantity and quality when encompassing smaller or emerging markets companies. Concerns have already emerged around data measurement and quality that can weaken the investment decision-making process<sup>11</sup> and be a barrier to further product development.

The development of reliable ESG data covering a wide range of companies is essential to extending the scope of PAB/CTB in the fixed income space beyond EUR Corp bonds.

## Performance and climate analysis of PAB ETFs

For this analysis, we selected four EUR Corp Bond PAB ETFs from three global ETFs providers – Amundi, iShares and Xtrackers and one ETF from passive fixed income specialist, Tabula. We acknowledge minor differences between ETFs’ starting universes but hypothesise that they are inconsequential in this paper’s context.

We first undertake a comparative analysis of ETF benchmark indices’ rules and construction. Secondly, we review performance and sector allocation to understand whether index differences significantly affect expected risk and return. Lastly, we assess which ETF methodologies provide the lowest climate footprint and best forward-looking alignment.

There is an overview of the four selected ETFs in Table 3. Two track indices developed by Solactive while the others are track Bloomberg/MSCI indices. Solactive has an open architecture that can include ESG data from various providers, whereas MSCI indices are based on internally generated data. We note that Tabula is the only ETF provider in the selection to have categorized its PAB ETF as Article 9 under SFDR as of end of January 2023, according to the [fund’s factsheet](#).

Table 3. AFII’s selection of four PAB EUR Corp bond ETFs. Sources: Bloomberg, AFII, fund factsheets.

ETF Name	Asset Manager	AUM (Mln EUR)	BBG Ticker	Underlying index
<a href="#">Xtrackers EUR Corporate Bond SRI PAB ETF</a>	DWS	2,160.00	XB4F GY Equity	Bloomberg MSCI Euro Corporate SRI PAB Index
<a href="#">iShares € Corp Bond ESG Paris-Aligned Climate ETF</a>	Blackrock	420.33	CBUJ GY Equity	Bloomberg MSCI EUR Corporate Climate Paris Aligned ESG Select Index
<a href="#">Tabula EUR IG Bond Paris-aligned Climate ETF</a>	Tabula	207.93	TABC GY Equity	Solactive ISS Paris Aligned Select Euro Corporate IG Index
<a href="#">Amundi iCPR Euro Corp Climate Paris Aligned PAB ETF</a>	Amundi	38.52	PABC GY Equity	Solactive iCPR Climate Credit PAB Index Total Return

<sup>11</sup> “[Equities: Are Paris-aligned benchmarks a climate gamechanger?](#)”, IPE, Sept 2022.

## ETF benchmark comparative analysis

Although the EU TEG's goal is to ensure comparability and standardisation of climate-aligned indices, we find that implementation differs across products as illustrated in

Table 4. Only the 'iShares € Corp Bond ESG Paris-Aligned Climate ETF' targets emissions reduction in both absolute and intensity terms. With a 10% year-on-year emissions reduction, iShares' ETF also appears more ambitious than its competitors, which abide by the EU TEG's minimum requirement of 7%.

Notwithstanding the EU TEG's lack of minimum ESG rating requirements, ETF providers in the sample consistently include ESG rating constraints in their index definition, either by excluding issuers with poor ESG ratings (all ETFs in the sample) or by increasing the fund's average ESG rating (only iShares' ETF).

It is rare to see financial firms go beyond a regulation's requirements. One plausible explanation is that a substantial number of PAB/CTB products are legacy items created from the conversion of funds launched before the introduction of PAB/CTB, which already included rules around ESG ratings. Another possibility is that such additional "features" enhance product differentiation in a very competitive environment.

Choice of ESG ratings type diverges between providers, which can result in significantly different outcomes considering the low correlation amongst ESG ratings<sup>12</sup>. Xtrackers and iShares methodologies are based on the MSCI ESG rating - which has a holistic approach to ESG - whereas Tabula and Amundi have chosen to exclude issuers based on their all-round environmental performance.

Considering PABs' potential to act as a core rather than a tactical allocation (thus accounting for a much higher level of capital), we favour strategies targeting an improvement of the three E, S and G pillars. Core portfolios should have a holistic approach to ESG.

We have reservations over the lack of transparency around achievement of the EU TEG's baseline exclusions. First, exclusions as defined in the indices' rulebooks do not follow the EU TEG's requirements by the letter. As an example, only the 'Amundi iCPR Euro Corp Climate Paris Aligned PAB ETF' explicitly excludes energy producers with an emissions intensity higher than 100CO<sub>2</sub>e/kWh as set by the EU TEG. As the EU TEG requirements only apply to fund holdings, explicit mention of the requirements in indices' rulebooks is not compulsory. We are concerned though that asset managers might fail to properly disclose adherence to the requirements.

Besides reducing historical emissions, the EU TEG's requirements also take a forward-looking stance at climate alignment by incentivising a weight increase for companies setting evidence-based targets, something explicitly mentioned only in iShares and Amundi methodologies. We opine that absence of such considerations in a PAB index weakens the strategy's overall climate alignment.

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<sup>12</sup> "[Aggregate Confusion: The Divergence of ESG Ratings](#)", Berg, Florian and Kölbel, Julian and Rigobon, Roberto, Aug 2019.

Table 4. Comparison of ETFs' benchmark indices rulebooks. Sources: Bloomberg, Solactive, MSCI, AFII.

Metrics	DWS PAB XB4F	iShares PAB CBUJ	Tabula PAB TABC	Amundi PAB PABC
<b>Reduction in weighted average absolute carbon emissions relative to the Parent Index</b>	-50%	-50%	-50%	-50%
<b>Self-decarbonization rate (year-on-year) based on absolute emissions</b>	-7%	-10%	-7%	-7%
<b>Self-decarbonization rate based on intensity emissions</b>	None	-10%	None	None
<b>Reduction in weighted average carbon intensity relative to the Parent Index</b>	None	-50%	None	None
	Thermal coal > 0%	Thermal coal >= 1%	Coal mining and power generation >= 1%	Coal >=1%
	Oil&Gas revenue >=10%	Oil&Gas revenue >=10%	Fossil fuel production, exploration, distribution, and services >=10%	Oil revenues >=10%
	Oil&Gas>0% AND alternative energy <40%	Power Generation revenue >= 50%	Electric power generation from fossil fuel sources >= 50%	Natural gas >= 50%
<b>Baseline exclusions</b>	Fossil fuel reserves >0	Unconventional Oil & Gas revenue >= 5%		Electricity production with GHG Emissions higher than 100gCO2e/kWh >= 50%
	Electric power generation from thermal coal >= 10%			
	Electric power generation from liquid fuel/natural gas >= 30%			
<b>Carbon reduction targets</b>	Not specified in the documentation	+20% weight increase for issuers setting carbon reduction targets	Not specified in the documentation	Issued by a company with CDP RATING worse than B- and not validated SBT TARGETS.
<b>Rating-based exclusions</b>	BBB or higher. Number of excluded issuers is higher than 20% of the eligible universe total number of issuers	B or higher	Significant Negative Impact on either SDG 12, 13, 14 or 15 (ISS rating)	o Issued by a company with a CDP RATING worse than C-  o Issued by a company for which no emissions data is available from CDP.
<b>ESG score improvement</b>	None	MSCI ESG score 20% increase	None	None

## Performance and sector allocation review

Turning now to performance, our historical timestamp is limited to less than a year due to iShares' ETF recent launch date and thus does not capture the market turmoil caused by Russian invasion of Ukraine. Nonetheless, we observe in Figure 2 that returns are highly correlated and seem only marginally impacted by strategies' specification differences. The Amundi PAB PABC has outperformed its peers by 95bps on average over the past six months while showing a 7.2% volatility (as opposed to 7.3% on average for the sample), likely justified by its lower portfolio duration. Indeed, we compare in Table 5 PAB ETFs durations which are broadly in the same range than DWS XBLC ETF's duration (our "standard" non-ESG EUR Corp Bond benchmark ETF) except for Amundi PAB PABC. This observation clearly suggests integration of PAB requirements does not substantially alter interest rate risk.

Figure 2. ETFs historical performance show a high correlation. Sources: Bloomberg, AFII.

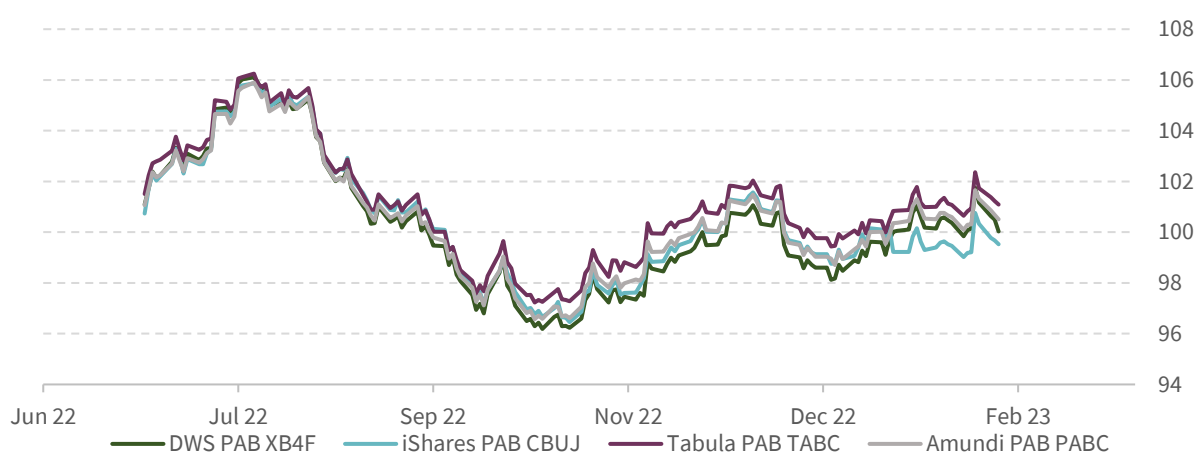


Table 5. ETFs duration compared to a non-ESG EUR Corp benchmark. Sources: funds factsheets, AFII.

ETF	DWS XBLC - bmk	DWS PAB XB4F	iShares PAB CBUJ	Tabula PAB TABC	Amundi PAB PABC
Duration	4.59	4.61	4.62	4.47	4.05
Duration type	Effective	Effective	Effective	?	Modified

Figure 3 illustrates the ETFs' sectoral allocations compared to DWS XBLC (the "standard" benchmark ETF as previously defined). We acknowledge minor differences in Tabula and Amundi starting universes, but we believe it paints a good overall picture of PAB ETFs' sector biases. Unsurprisingly, the figures show that PAB ETFs in our sample are overweighted towards low emitting sectors such as financials and communications, while their allocation to real estate and industrials is noticeably low.

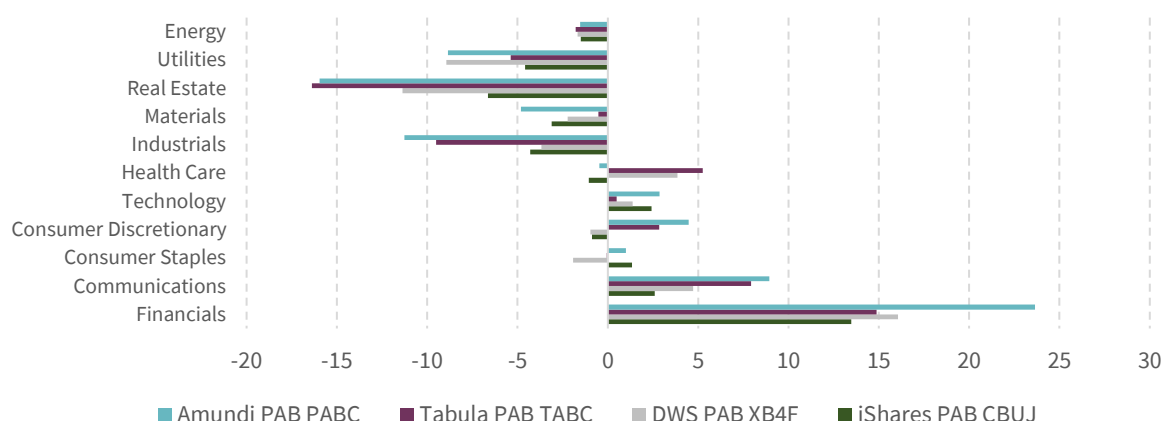
Despite all ETFs in the sample having a significant exposure to financials, Amundi's 23.65% overweight is strikingly high. iShares' ETF sectoral allocation is noticeably well-balanced compared to peers, especially in high emitting sectors. Although EU TEG's requirements barely leave room for manoeuvre to create portfolios with sectoral allocation close to standard benchmarks, we see a risk of failing to actively participate in the transformation of key sectors for



climate change.<sup>13</sup> According to a recent report from the Net-Zero Asset Owner Alliance, “Exclusions of high emitting sectors or constituents are not necessary to achieve decarbonisation objectives. Rather, benchmarks should tilt the weights in favour of the decarbonisation leaders”.<sup>14</sup>

Additionally, strict investment mandates guidelines can prevent investors (especially in the institutional space) from switching to products with significant sector biases. In that case, a best-in-class approach that selects the most sustainable companies in each sector while constraining sector allocation can prove an effective alternative to drive climate transition. Such strategies also have the benefit of avoiding the use of optimisers.

Figure 3. Sectoral allocations of our ETF sample compared to a standard EUR Corp bonds benchmark. Sources: AFII, Bloomberg. Data as of 18 Jan 2023.



## ETF Trading statistics

Trading statistics of our ETFs sample summarized in Table 6 provide a disparate picture, with Tabula showing a noticeably wider bid-ask spread than other ETFs. Tracking errors on the other hand are consistent across the sample.

An unexpected finding is the difference between numbers of bonds for DWS PAB XB4F and iShares PAB CBUJ (tracking MSCI indices) as opposed to Tabula PAB TABC and Amundi PAB PABC (tracking Solactive indices). Despite all ETFs having comparable starting universes sizes, Tabula and Amundi portfolios consist of only approximately 10% of bonds from the starting universe while this number surges to 50-70% for DWS and iShares. This is a surprising result and we do not think it can be attributed to the differences in indices’ design or the funds’ smaller AUMs. We see two plausible explanations: either the index construction process for Solactive includes more stringent trading/turnover guidelines or there are substantial design disparities between MSCI and Solactive’s optimization algorithms.

Table 6. ETFs trading statistics. Sources: AFII, Bloomberg, funds factsheets.

ETF	DWS XBLC - bmk	DWS PAB XB4F	iShares PAB CBUJ	Tabula PAB TABC	Amundi PAB PABC
Average bid-ask spread %	0.1261	0.0819	0.1759	0.2512	0.1215
# bonds - starting universe	3496	3496	3496	3579	3579
# bonds - ETF	3484	2471	1801	373	256
Tracking error - 3m	4.486	4.446	4.242	4.515	4.025

<sup>13</sup> To get a deeper perspective on the engagement vs divestment debate, please see “[To Divest or to Engage? A Case Study of Climate-Change Activism](#)”, University of Cambridge, 15 Sept 2019.

<sup>14</sup> “[Development and Uptake of Net-Zero-Aligned Benchmarks](#)”, Net-Zero Asset Owner Alliance, Nov 2022.



## Comparing ETFs’ climate footprint

Next, we leverage both MSCI’s public ESG fund ratings tool<sup>15</sup> and AFII’s Fixed Income Optimisation for Net zero Alignment (FIONA) tool, which analyses and optimise fixed income portfolios,<sup>16</sup> to compare ETF’s climate footprint and forward-looking alignment.

MSCI launched its ESG fund ratings tool in July 2019 providing market participants with aggregated ESG metrics of an extensive set of funds and ETFs. MSCI recently added an “Implied Temperature Rise” (ITR) fund rating, aggregating fund holdings’ individual ITR to evaluate it at the fund level. MSCI launched its “Implied Temperature Rise” (“ITR”) in September 2021. It is a forward-looking measure assessing companies’ alignment with a 1.5-2°C scenario. Based on companies’ track record and reduction targets statements, MSCI deciphers whether the company’s projected emissions align with a trajectory towards a 2050 2°C scenario.<sup>17</sup>

MSCI acknowledges that PAB indices can show an ITR misaligned with Paris Climate Agreements as “90% of the world’s public companies have an Implied Temperature Rise of above 1.5°C”, posing diversification challenges.<sup>18</sup>

We have applied the FIONA framework to the climate alignment of the four EU IG PAB corporate indices, comparing to a non-PAB benchmark (see Appendix).

FIONA utilises a ranking system of 1(High)/2(Medium)/3(Low) that is applied to sectors and again to issuers within the sectors, generating a final score that is the product of the two rankings (with 9 being the “worst” score of an issuer). For sector rankings we look at emissions, temperature and rating, but overlay judgement. Within the sectors, the ranking is data-driven based on emissions intensity and separated by dynamic thresholds based on medians of the regions. Missing data is penalised to promote data disclosure.

To produce portfolio outputs, we use consistent data sourcing and extrapolation methods that consider both duration and green bond adjustments (with discounts on ESG metrics).

Table 6. FIONA & MSCI comparison of PAB ETFs and Index ETF. Sources: Bloomberg, AFII, MSCI.

Portfolio metrics	Source	Index XBLC GY	DWS PAB XB4F	iShares PAB CBUJ	Tabula PAB TABC	Amundi PAB PABC
FIONA score	AFII - FIONA	3.1	2.8	2.9	3.0	3.1
ESG Risk SCR	AFII - FIONA	20.6	19.2	18.2	20.5	20.4
MSCI Implied Temperature Rise (% of portfolio <= 2°C)	AFII - FIONA	56%	64%	68%	62%	69%
Implied Temperature Rise alignment	MSCI	Misaligned – between 2.0 and 3.2°C	Aligned – between 1.5 and 2.0°C	Aligned – between 1.5 and 2.0°C	Misaligned – between 2.0 and 3.2°C	Aligned – between 1.5 and 2.0°C
<b>Direct emissions intensity (kTon/EURmm sales)</b>	AFII - FIONA	139.7	91.1	84.3	207.0	66.5
Average carbon intensity (tCO2e / USDmm sales)	MSCI	125.5	82.4	80.8	173.5	63.0
Carbon footprint (kton, EUR 1bn portfolio)	AFII - FIONA	53.1	40.8	31.0	101.4	30.5

<sup>15</sup> “[ESG Fund Ratings and Climate Search Tool](#)”, MSCI

<sup>16</sup> For an example of the analysis please see “[Decarbonising iShares’ LQD ETF](#)”, AFII, 15 Dec 2022. Please reach out for more specific details.

<sup>17</sup> MSCI’s ITR won Environmental Finance’s “ESG Assessment tool of the year” award in 2022. See [ESG assessment tool of the year, investment: MSCI ESG Research's Implied Temperature Rise](#), Environmental Finance.

<sup>18</sup> “[EU Paris-Aligned Benchmark \(PAB\)](#)”, MSCI.

Table 6 gives the impact metrics of each portfolio using FIONA analysis and MSCI data. Emissions numbers are not identical, but all within 9% of the funds' reported numbers after currency conversion. The numbers confirm the alignment disclosure with DWS, iShares and Amundi all showing carbon footprints lower than the index, and report as being aligned with 1-5-2.0°C. The Tabula fund has nearly double the carbon footprint of the index, which is consistent with being misaligned, a surprising observation considering it is the only fund in the sample categorised as Article 9 under SFDR.

Our analysis shows that Tabula's high carbon footprint is mainly due to the fact that over 3% of the portfolio is invested in HeidelbergCement, which has a direct emissions intensity of almost 4000 kTon/EURmm sales in the dataset used. Additionally, HeidelbergCement has an individual MSCI ITR of 2.9°C. To allow such a high weighting to a non-aligned issuer raises a query as to the validity of its PAB framework or the quality of its input data.

Appendix 1 shows full dashboards for each PAB ETF compared with the benchmark non-aligned index. iShares, Amundi and DWS funds each offer material reduction in emissions and carbon footprint, without significant loss of return or increase in VaR. Amundi has higher individual weights (due to it being a small portfolio, and so having fewer securities), however even this does not introduce a meaningful tracking error and shows that new funds can offer value.

When observing sector weights in the dashboards, it again becomes clear that all four PAB ETFs have increased their weightings in low-emitting sectors such as financials and communications and correspondingly decreased weights in high-emitting ones such as materials and utilities, which are also shown as being the sectors with the highest carbon footprint.

## Conclusion

Our analysis reveals that PAB products provide investors with broad indices offering a better climate footprint than traditional indices.

However, their complex design, requiring an extensive amount of data and advanced mathematical methods, might reduce investors’ financial and climate performance transparency. In our view, optimisers - which cannot be interpreted easily by investors – should not form part of indices aiming to provide investors with a broad market exposure. If considering climate as a “factor”, it can even be argued that PAB fall into the category of “quantitative factor passive strategies” in the fund market. Unfortunately, this complex situation highlights a major disconnect between regulators’ intentions and market practicalities.



Furthermore, while these strategies may have a similar risk and return profile as traditional indices, their construction can result in significant sector biases that could cause substantial tracking errors for PAB products in future.

Lastly, although some sustainability metrics are disclosed in funds’ sustainability reports, we suggest that specific PAB/CTB reporting is undertaken to increase transparency around these products’ alignment with the EU TEG’s requirements.

While we understand that for many funds the reassurance of the EU’s “stamp of approval” through PAB will be attractive, on balance we favour “best-in-class” climate strategies, which invest in companies that are leaders in their sector in terms of climate footprint. Such strategies have the potential to deliver similar climate outcomes with a simpler construction and sectoral allocation that align with broad market indices.

Table 7 provides a summary of our findings.

Table 7. PAB opportunities and challenges summary. Source: AFII

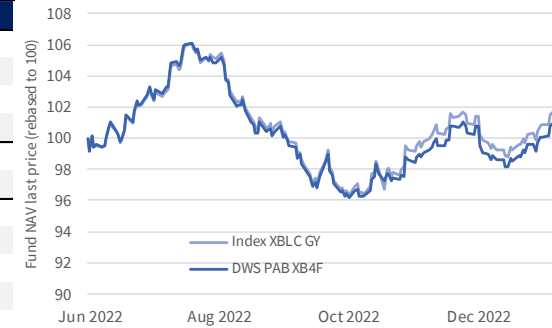
 <b>A promising tool for driving transition</b>	 <b>Attention points</b>
<ul style="list-style-type: none"> <li>• Broad indices with both substantial climate enhancement and better alignment with Paris climate goals, with limited impact on risk and performance.</li> <li>• Climate alignment “ensured” by the European Union.</li> </ul>	<ul style="list-style-type: none"> <li>• Significant sector biases.</li> <li>• Lack of transparency due to complex index construction.</li> <li>• Implementation differences across providers with questionable added value of non-PAB index rules.</li> <li>• Substantial amount of data required which may delay implementation across all segments of the fixed income market.</li> <li>• Discrepancies between EU TEG’s requirements and index rules.</li> </ul>

# Appendix 1 – FIONA dashboards

Figure 4 FIONA metrics on DWS PAB XB4F and the index XBLC GY. Source: Bloomberg, AFII.

## Portfolio metrics

	Index XBLC GY	DWS PAB XB4F	
<b>Risk</b>	Average duration	4.3	4.5
	95% daily VAR	1.57%	1.62%
	Maximum individual bond weight	0.15%	0.27%
	Maximum individual issuer weight	1.82%	2.03%
<b>Return</b>	Cumulative returns (%)	1.7%	0.9%
	Tracking error (%)		0.13%
<b>Impact (Average)</b>	FIONA score	3.1	2.8
	MSCI portfolio-weighted ITR (% of portfolio <= 2°C)	56%	64%
	ESG Risk SCR	20.6	19.2
	Direct emissions intensity (kTon/EURmm sales)	139.7	91.1
Carbon footprint (kton, EUR 1bn portfolio)	53.1	40.8	



# FIONA

FIXED

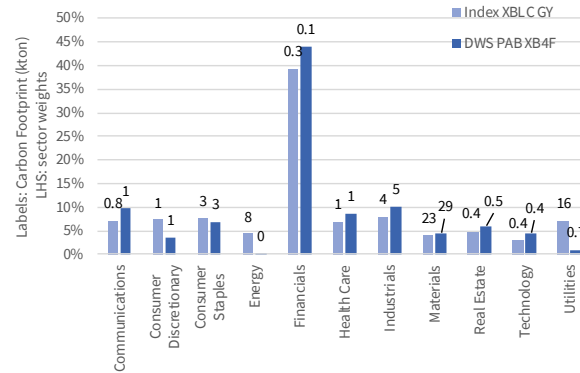
anthropocene

INSTITUTE

INCOME

Sample PAB

Run date: 03 Jan 2023



### Top index XBLC GY issuers

	Index weight	Issuer score
BNP Paribas SA	1.82%	4
Banque Federative du Credit Mutuel SA	1.78%	4
Credit Agricole SA	1.71%	4
Volkswagen AG	1.32%	2
Banco Santander SA	1.30%	2
Societe Generale SA	1.19%	4
ING Groep NV	1.19%	2
Orange SA	1.17%	2
BPCE SA	1.13%	4
TotalEnergies SE	1.11%	6

### Top DWS PAB XB4F issuers

	PAB weight	Issuer score
BNP Paribas SA	2.03%	4
Banque Federative du Credit Mutuel SA	1.96%	4
Credit Agricole SA	1.90%	4
Banco Santander SA	1.52%	2
Orange SA	1.48%	2
Societe Generale SA	1.40%	4
ING Groep NV	1.34%	2
BPCE SA	1.31%	4
Verizon Communications Inc	1.15%	2
Goldman Sachs Group Inc/The	1.07%	2

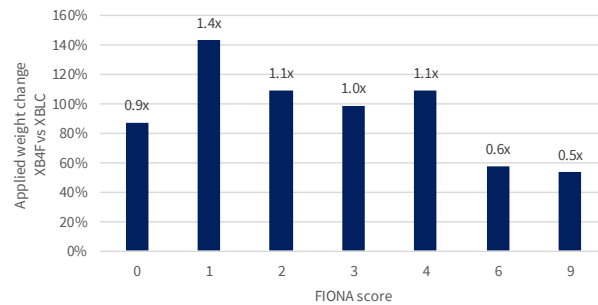
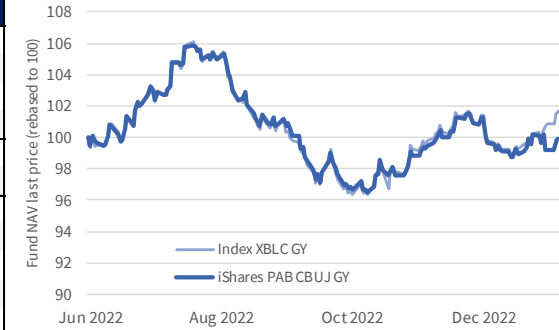


Figure 5 FIONA metrics on iShares PAB CBUJ and the index XBLC GY. Source: Bloomberg, AFII.

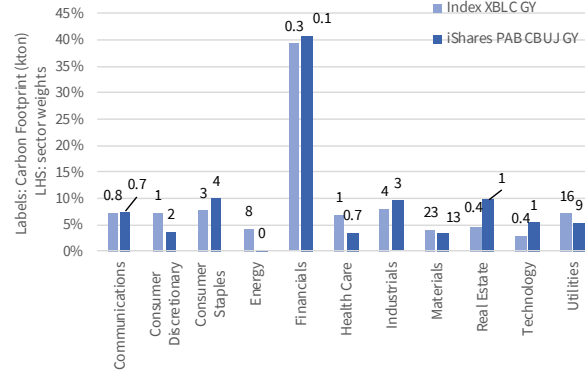
Portfolio metrics		Index XBLC GY	iShares PAB CBUJ GY
<b>Risk</b>	Average duration	4.3	4.5
	95% daily VAR	1.57%	1.41%
	Maximum individual bond weight	0.15%	0.37%
	Maximum individual issuer weight	1.82%	1.79%
<b>Return</b>	Cumulative returns (%)	1.7%	-0.1%
	Tracking error (%)		0.20%
<b>Impact (Average)</b>	FIONA score	3.1	2.9
	MSCI portfolio-weighted ITR (% of portfolio <= 2°C)	56%	68%
	ESG Risk SCR	20.6	18.2
	Direct emissions intensity (kTon/EURmm sales)	139.7	84.3
	Carbon footprint (kton, EUR 1bn portfolio)	53.1	31.0



# FIONA

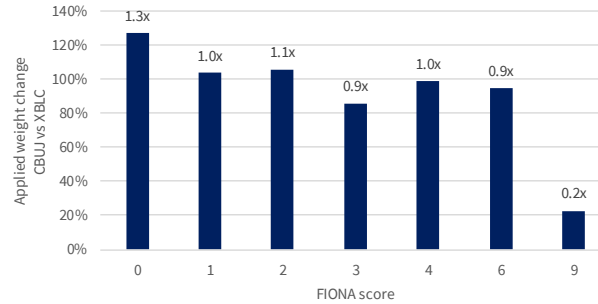
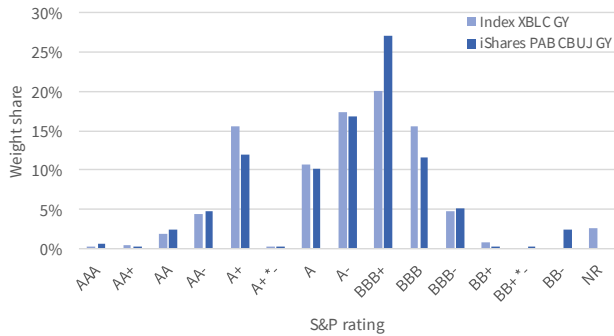
**Sample PAB**

**Run date: 03 Jan 2023**



**Top index XBLC GY issuers**

	Index weight	Issuer score
BNP Paribas SA	1.82%	4
Banque Federative du Credit Mutuel SA	1.78%	4
Credit Agricole SA	1.71%	4
Volkswagen AG	1.32%	2
Banco Santander SA	1.30%	2
Societe Generale SA	1.19%	4
ING Groep NV	1.19%	2
Orange SA	1.17%	2
BPCE SA	1.13%	4
TotalEnergies SE	1.11%	6



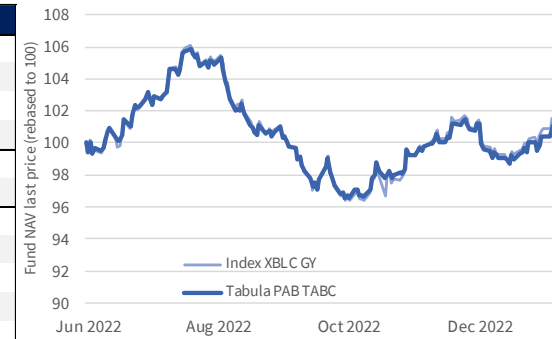
**Top iShares PAB CBUJ GY issuers**

	PAB weight	Issuer score
Societe Generale SA	1.79%	4
BNP Paribas SA	1.72%	4
Siemens AG	1.59%	2
ING Groep NV	1.53%	2
Credit Agricole SA	1.48%	4
Enel SpA	1.37%	6
Orange SA	1.35%	2
Nestle SA	1.32%	6
Allianz SE	1.27%	2
Unibail-Rodamco-Westfield	1.26%	2

Figure 6 FIONA metrics on Tabula PAB TABC and the index XBLC GY. Source: Bloomberg, AFII.

**Portfolio metrics**

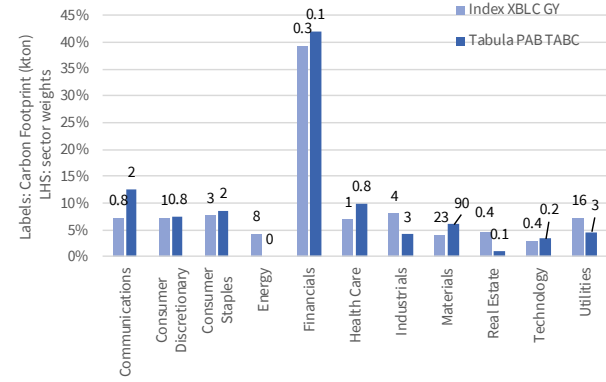
	Index XBLC GY	Tabula PAB TABC	
<b>Risk</b>	Average duration	4.3	4.4
	95% daily VAR	1.57%	1.54%
	Maximum individual bond weight	0.15%	1.89%
	Maximum individual issuer weight	1.82%	3.48%
<b>Return</b>	Cumulative returns (%)	1.7%	1.2%
	Tracking error (%)		0.15%
<b>Impact (Average)</b>	FIONA score	3.1	3.0
	MSCI portfolio-weighted ITR (% of portfolio <= 2°C)	56%	62%
	ESG Risk SCR	20.6	20.5
	Direct emissions intensity (kTon/EURmm sales)	139.7	207.0
	Carbon footprint (kton, EUR1bn portfolio)	53.1	101.4



# FIONA

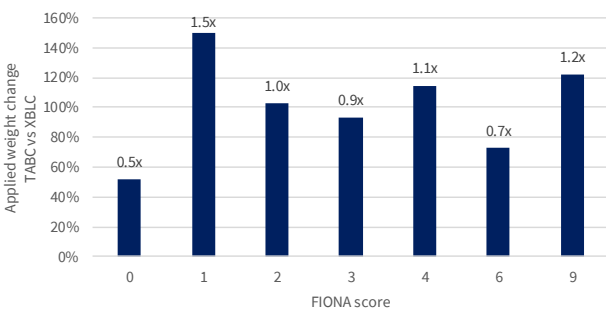
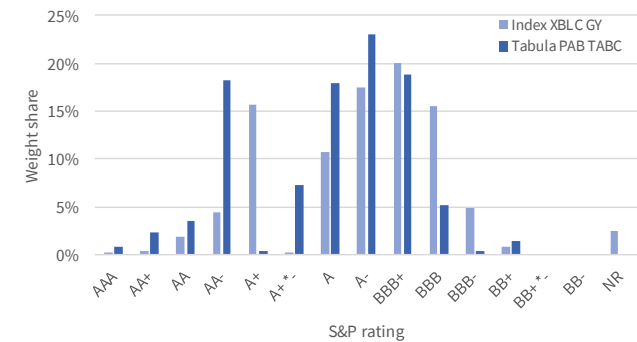
**Sample PAB**

**Run date: 03 Jan 2023**



**Top index XBLC GY issuers**

	Index weight	Issuer score
BNP Paribas SA	1.82%	4
Banque Federative du Credit Mutuel SA	1.78%	4
Credit Agricole SA	1.71%	4
Volkswagen AG	1.32%	2
Banco Santander SA	1.30%	2
Societe Generale SA	1.19%	4
ING Groep NV	1.19%	2
Orange SA	1.17%	2
BPCE SA	1.13%	4
TotalEnergies SE	1.11%	6



**Top Tabula PAB TABC issuers**

	PAB weight	Issuer score
HeidelbergCement AG	3.48%	9
Banque Federative du Credit Mutuel SA	3.31%	4
Credit Agricole SA	3.15%	4
Mercedes-Benz Group AG	2.67%	4
Orange SA	2.39%	2
ING Groep NV	2.27%	2
Wells Fargo & Co	2.15%	2
BNP Paribas SA	2.03%	4
Verizon Communications Inc	1.93%	2
Banco Santander SA	1.93%	2

Figure 7 FIONA metrics on Amundi PAB PABC and the index XBLC GY. Source: Bloomberg, AFII.

Portfolio metrics		Index XBLC GY	Amundi PAB PABC
<b>Risk</b>	Average duration	4.3	4.1
	95% daily VAR	1.57%	1.54%
	Maximum individual bond weight	0.15%	1.05%
	Maximum individual issuer weight	1.82%	5.48%
<b>Return</b>	Cumulative returns (%)	1.7%	1.6%
	Tracking error (%)		0.14%
<b>Impact (Average)</b>	FIONA score	3.1	3.1
	MSCI portfolio-weighted ITR (% of portfolio <= 2°C)	56%	69%
	ESG Risk SCR	20.6	20.4
	Direct emissions intensity (kTon/EURmm sales)	139.7	66.5
	Carbon footprint (kton, EUR 1bn portfolio)	53.1	30.5

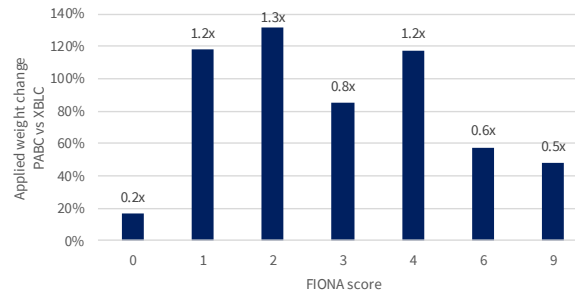
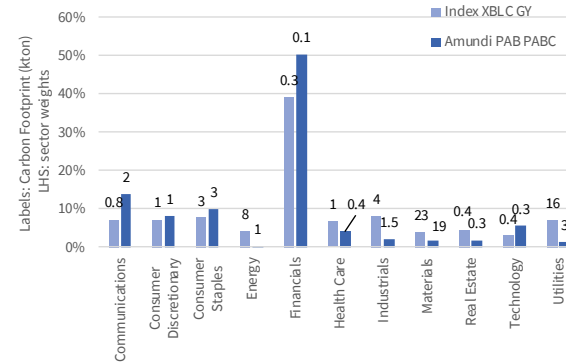
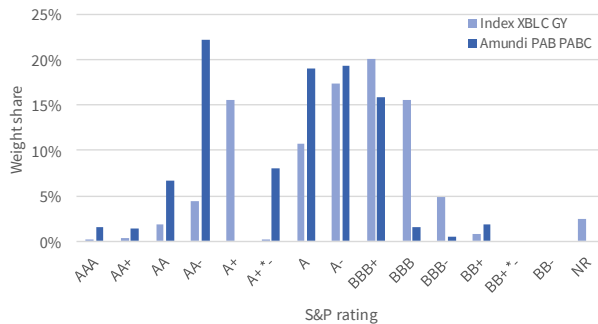


# FIONA

FIXED

INCOME

**Sample PAB**  
Run date: 03 Jan 2023



**Top index XBLC GY issuers**

	Index weight	Issuer score
BNP Paribas SA	1.82%	4
Banque Federative du Credit Mutuel SA	1.78%	4
Credit Agricole SA	1.71%	4
Volkswagen AG	1.32%	2
Banco Santander SA	1.30%	2
Societe Generale SA	1.19%	4
ING Groep NV	1.19%	2
Orange SA	1.17%	2
BPCE SA	1.13%	4
TotalEnergies SE	1.11%	6

**Top Amundi PAB PABC issuers**

	PAB weight	Issuer score
Credit Agricole SA	5.48%	4
Morgan Stanley	4.86%	2
BNP Paribas SA	4.64%	4
Banco Santander SA	3.78%	2
Anheuser-Busch InBev SA/NV	3.73%	6
AT&T Inc	3.65%	3
Goldman Sachs Group Inc/The	3.51%	2
Mercedes-Benz Group AG	3.29%	4
Societe Generale SA	3.15%	4
Orange SA	2.70%	2



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