Introducing the J.P. Morgan Paris-Aligned CEMBI Broad Diversified Index

Index Methodology and Profile

Global Index Research

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Highlights

This J.P. Morgan Paris Aligned CEMBI Broad Diversified Index (JPM PAB CEMBI) Factsheet should be read in conjunction with the J.P. Morgan Paris Aligned and Climate Transition Benchmarks Rules and Methodology which can be found on our public website (link).

The JPM PAB CEMBI Index applies the J.P. Morgan Paris-Aligned and Climate Transition Benchmarks Rules and Methodology overlay to the flagship J.P. Morgan CEMBI Broad Diversified (CEMBI) Index (link), the Parent Index.

The JPM PAB CEMBI tracks the performance of US dollar-denominated bonds issued by Emerging Market corporate entities, and is designed to reflect the minimum technical requirements as set out by the European Commission's Delegated Act (Delegated Act).[1]

JPM PAB Indices seek at least a 50% absolute GHG emissions reduction compared to the corresponding Parent Index and apply at least a 7% reduction on average per annum. JPM PAB Indices use the 1.5°C temperature scenario, with no or limited overshoot referred to in the Special Report on Global Warming of 1.5 °C from the Intergovernmental Panel on Climate Change (IPCC), as the reference scenario to construct the index methodology.

The JPM PAB CEMBI Index selects, weights and excludes constituents with the aim that the resulting emissions of the remaining underlying constituents as a whole will be aligned with the objectives of the Paris Agreement adopted under the United Nations Framework Convention on Climate Change, ratified by the European Union on 5 October 2016 (the Paris Agreement). The Paris Agreement seeks to limit global warming to well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 degrees Celsius.

The returns and statistics for the JPM PAB CEMBI Index are available since December 2021.

At launch, the JPM PAB CEMBI Index covers over US$825 billion in emerging market corporate debt stock. The benchmark tracks 1,324 bonds from 548 issuers across 55 countries.

1. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R1818&secureweb=prime

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Index Criteria

Instrument Type	Includes both fixed and floating rate securities along with capitalizing/amortizing bonds or loans. Excludes convertibles, inflation-linked instruments, and defaulted bonds.*
Issuer Type	Corporate issuers and Quasi-Sovereigns that are less than 100% government owned
Issuer Country of Risk	Issuers must be: • Country of risk of the guarantor (must be 100%), or • Country where majority of issuer's assets are located, or • Country where issuer's operating headquarters is located, and centralized decision-making occurs. EM country/economy is defined as a distinct list of countries in the following regions: Asia ex Japan/Australia/New-Zealand, Latam, Eastern Europe, Middle East/Africa
Remaining Maturity	Only those instruments with at least 2.5 years until maturity are considered for inclusion. Once added, an instrument may remain in the index until 6 months before it matures.
Amount Outstanding	Only issues with a current face amount outstanding of US$300 million or more are considered for inclusion
Currency	Only USD denominated bonds are included. Instruments where the amount of coupon or redemption payment is linked to an exchange rate are not eligible for inclusion.

**Excluded instruments are not excluded based on E, S and / or G considerations.*

Key Performance Metrics

Metric	PAB CEMBI	CEMBI BD*
TR 2022	-11.31%	-12.26%
TR 2023	8.17%	9.08%
TR 2024 YTD	8.41%	8.22%
Cumulative Return	4.00%	3.57%
Annualized Return	1.35%	1.21%
Annualized Volatility	6.91%	7.29%
Sharpe Ratio	-0.37	-0.37
Yield	6.30	6.30
Duration	3.63	4.22
Coupon	5.07	5.20

Data as of November 29, 2024.

**Stats presented assuming inception date of December 2021.*

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JPM PAB Overlay Criteria

The JPM PAB CEMBI Index applies J.P. Morgan Paris-Aligned and Climate Transition Benchmarks Rules and Methodology overlay (link) as an overlay to the flagship J.P. Morgan CEMBI Broad Diversified (CEMBI) Index (link).

For details on the ESG data providers, decarbonisation mechanisms and exclusions used in the determination of the JPM PAB CEMBI, please refer to the J.P. Morgan Paris-Aligned and Climate-Transition Benchmarks Rules and Methodology.

ESG data providers	Sustainalytics Moody's
Baseline Exclusions	• Issuers with revenue from the following activities: ◦ Controversial weapons ◦ Tobacco • Issuers not in compliance with the UN Global Compact principles • Issuers found to significantly harm one or more of the environmental objectives referred to in Article 9 of Regulation (EU) 2020/852 of the European Parliament and of the Council (EU Taxonomy)
Activity Exclusions	Issuers with revenue from the following activities: • ≥ 1 % from exploration, mining, extraction, distribution or refining of hard coal and lignite • ≥ 10% from the exploration, extraction, distribution or refining of oil fuels • ≥ 50 % from the exploration, extraction, manufacturing or distribution of gaseous fuels; • ≥ 50% from electricity generation with a GHG intensity of more than 100g CO_2e/kWh.
Baseline Reduction of GHG emissions	50%
Decarbonization Trajectory	At least 7% year on year reduction from the Base Year.
High Emission and Low Emission Bucket Methodology	Issuers are divided into three Emissions Buckets based on their weighted contribution % to the JPM PAB CEMBI Index Emissions. To reduce turnover between Emissions Buckets, an additional threshold is set for entry into a lower Emissions Bucket. At index inception multipliers for all buckets are 1, At the first rebalance the Emission Bucket scalars and thresholds are defined as: (see table below) The relative weight of the Very High Emissions and High Emissions Buckets will be gradually reduced over time to achieve the Annual Emissions Target for each year.
Annual Emissions Targets	The PAB CEMBI Index Emissions at index inception is 20.57 $MtCO_2e$. The Annual Emissions target that the PAB CEMBI is required to meet is as follows: (see table below)

Emissions Bucket	Contribution % to CTB CEMBI emissions	Scalar applied to Parent Index MV	Threshold to move into lower bucket %
Very High Emissions	≥ 12	0	11
High Emissions	≥ 3 < 12	1	2.5
Low Emissions	< 3	1	-

Year	Annual Emissions Target ($MtCO_2e$)
2022	19.13
2023	17.79
2024	16.54
2025	15.38
2026	14.31
2027	13.31
2028	12.37
2029	11.51
2030	10.70

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Rebalancing Rules	**Monthly** • If an issuer is eligible for exclusion due to changes in the Baseline Exclusions or Activity Exclusions, the action will take place at the next monthly rebalance date after the change in eligibility occurs. • If an issuer is eligible for a different Emission Bucket than the one it is currently in, due to changes in issuance or the issuer's contribution to the JPM PAB CEMBI Emissions, it will be moved into the new Emission Bucket at the next monthly rebalance. • Composition and reference data changes in the underlying Parent Index as a result of capital market activity will be taken into account on a monthly basis when considering the issuers continuing eligibility. **Semi-Annual** • The JPM PAB CEMBI is rebalanced semi-annually at January month-end and July month-end to ensure that the JPM PAB CEMBI Emissions meet the required Annual Emissions Targets.

Source: J.P. Morgan

Index Characteristics and Methodology

The following sections set out information on the characteristics and methodology of the underlying Parent Index, the J.P. Morgan CEMBI Broad Diversified (CEMBI) Index (link).

Pricing:	Bid and Ask prices are taken from a third-party pricing source PricingDirect.
Aggregate Return:	Index/Country level total return is calculated as a market-weighted average of bond returns using bid side prices.
Rebalancing:	Rebalances on the last US business day of the month.
Coupon Treatment:	All coupons received are immediately reinvested into the index.
FX Rates:	All FX rates used for hedged/unhedged returns are as of 4pm London time provided by WM/Reuters.
Hedging Strategy:	Assume a 1-month currency forward position that begins on rebalance day and ends on next rebalance day.
Weighting:	Market capitalization-based weighting.
Holiday Calendar:	Follows US bond market calendar set by Emerging Markets Trader Association (EMTA).
Ratio between the market value of the securities in this Index and those in the CEMBI BD Index	68.10% (as of November 2024)
Bloomberg Ticker	JBCDPAB

Source: J.P. Morgan

Defining the universe of eligible countries
The index suite includes a specific set of Emerging Market countries, which is currently a distinct set of countries falling in Asia ex Japan/Australia/New Zealand, Latin America, Eastern Europe, Middle East/Africa.

Instrument Type
The PAB CEMBI Index includes both fixed and floating rate instruments, as well as capitalizing/amortizing bonds. Bonds with embedded options and warrants are eligible for inclusion if a) the options/warrants are attached to instruments that would otherwise be included in the index and b) the quotation convention—as recommended by the Emerging Markets Traders Association (EMTA)—is for instrument prices to be quoted cumulative options or warrants. Convertible bonds are not eligible for inclusion into the index.

A default event will force the removal of the affected instrument from the PAB CEMBI Index. The issuer will be removed at the month-end during the rebalancing period.

A default event is deemed to occur if any one of the following conditions is met:

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- Issuer failed to pay a scheduled interest or principal payment on an instrument within the grace period,
- Instruments that fall under the cross-default provision,
- Issuer has completed a distressed exchange,
- Issuer has filed for Bankruptcy and the issuance is in scope for legal actions,
- One or more of the credit rating agencies (S&P, Moody, or Fitch) has downgraded the instrument level rating to credit default (or equivalent).

Issuer Type and Country of Risk

Bonds are eligible for inclusion in the PAB CEMBI Index if:

- The issuance is 100% guaranteed by an entity within an Emerging Markets economy, or
- Majority of issuer's assets are located in Emerging Markets economy, or
- Issuer's operating headquarter is located, and centralized decision making occurs in Emerging Markets economy.

Emerging Market (EM) / Developed Market (DM) Index eligibility of multi-national companies with geographically diverse exposures will be assessed based on the guarantor, assets, or location of headquarters (decision-making center). Please note that this framework is intended solely to handle those cases where the 'Country of Risk' assignment (and consequently EM vs DM classification) for a given company cannot be unequivocally inferred from reference data sources.

Index rebalancing rules

Index rebalancing occurs monthly on the last US business day of each month. A new bond issue that meets the index inclusion criteria will be assessed for inclusion at the month-end rebalance provided its settlement date falls on or before the month-end rebalance date of the same month ("settlement date rule"). Bonds that fail to comply with the index criteria will be removed. Full or partial calls, taps or buybacks, and any rating changes are also reflected at this time.

An exception concerns Reg S securities. An instrument that is issued purely in reliance on Regulation S of the US Securities Act of 1933 and not pursuant to Rule 144A will be ineligible for inclusion in the index until it is seasoned (that is, until the expiration of the relevant Regulation S restricted period). The date at which the seasoning restriction is lifted will effectively be the new "issue" date, at which point the settlement date rule will apply.

Fully called bonds are removed from the index in the current month if the call date falls before the following month-end rebalance.

A specific case is a new issue that is released as part of a debt exchange program. At the month-end rebalancing date immediately following this event, the amount of debt retired in this exchange would be removed from the index, and the new issue would be added to the index (provided official exchange results are made available in a timely manner).

Weighting Methodology

The PAB CEMBI Index applies a decarbonization and screening methodology to comply with the minimum technical requirements as set out by the Delegated Act. The PAB CEMBI Index applies the J.P. Morgan Paris-Aligned Benchmarks (JPM PAB) Methodology (link) overlay to the flagship J.P. Morgan CEMBI Broad Diversified (CEMBI) Index (link).

The flagship CEMBI Index diversification methodology anchors on the average size of the countries in the index and the debt stock size of the largest country in the index by only including a specified portion of these countries' eligible current face amounts of debt outstanding. Once these country level allocations are derived for each country, the current settlement price for each instrument within each country is applied to its index allocation to calculate the market capitalization of each instrument in the index. The weight of each instrument in the index is then determined by dividing its market capitalization by the total market capitalization for all of the index's instrument allocations. The result represents the weight of each issue expressed as a percentage of the index.

The CEMBI Index employs a diversification methodology that focuses on the average size of countries within the index and the debt stock of the largest country. It includes only a specified portion of each country's eligible debt, essentially reallocating excess weight from larger countries in the index to smaller countries in order to achieve a more even distribution. Once these allocations are determined, the current settlement price of each instrument is applied to calculate its market capitalization. The weight of each instrument in the index is then calculated by dividing its market capitalization by the total market capitalization of all instruments.

Appendix

Glossary

Emerging Markets: A country is classified as Emerging Markets within the J.P. Morgan CEMBI Broad Diversified (CEMBI) Index (link), if it falls within the regions of Asia (ex Japan/Australia/New Zealand), Latin America, Eastern Europe, Middle East and Africa.

Developed Markets: A country is classified as Developed Markets within the Markets within the J.P. Morgan CEMBI Broad Diversified (CEMBI) Index (link), if it does not fall into the definition of Emerging Markets above.

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ESG Disclosures

EXPLANATION OF HOW ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY	
SECTION 1 – CONSIDERATION OF ESG FACTORS	
Item 1. Name of the benchmark administrator.	J.P. Morgan Securities LLC
Item 2. Type of benchmark or family of benchmarks. *Choose the relevant underlying asset from the list provided in "**Annex II**" of the applicable legislation under EU BMR or UK BMR.*	Paris-Aligned and Climate-Transition Fixed Income Indices For the purposes of Annex II, the relevant underlying assets are Fixed Income.
Item 3. Name of the benchmark or family of benchmarks.	Paris-Aligned and Climate-Transition Fixed Income Indices Family.
Item 4. Are there in the portfolio of the benchmark administrator any EU Climate Transition Benchmarks, UK Climate Transition Benchmarks, EU Paris-aligned Benchmarks, UK Paris-aligned Benchmarks, benchmarks that pursue ESG objectives or benchmarks that take into account ESG factors?	Yes
Item 5. Does the benchmark or family of benchmarks pursue ESG objectives?	Yes, each benchmark within the family of Paris-Aligned and Climate-Transition Fixed Income Benchmarks pursues ESG objectives.
Item 6. Where the response to Item 5 is positive, provide below the details (score) in relation to the ESG factors listed in Annex II for each family of benchmarks at aggregated level. The ESG factors shall be disclosed at an aggregated weighted average value at the level of the family of benchmarks.	
a) List of combined ESG factors[1]:	Mandatory disclosures of ESG factors as listed in Annex II, for each Benchmark in the Paris- Aligned and Climate- Transition Fixed Income Benchmark family, is available here.
b) List of environmental factors[2]:	Mandatory disclosures of environmental factors as listed in Annex II, for each Benchmark in the Paris- Aligned and Climate- Transition Fixed Income Benchmark family, is available here.
c) List of social factors[3]:	Mandatory disclosures of social factors as listed in Annex II, for each Benchmark in the Paris- Aligned and Climate- Transition Fixed Income Benchmark family, is available here.
d) List of governance factors[4]:	Mandatory disclosures of governance factors as listed in Annex II, for each Benchmark in the Paris- Aligned and Climate- Transition Fixed Income Benchmark family, is available here
7. Where the response to Item 5 is positive, provide below the details (score) for each benchmark, in relation to the ESG factors listed in Annex II, depending on the relevant underlying asset concerned. Alternatively, all of this information may be provided in the form of a hyperlink to a website of the benchmark administrator included in the benchmark statement. The information on the website shall be easily available and accessible. Benchmark administrators shall ensure that the information published on their website remains available for five years. The score of the ESG factors shall not be disclosed for each constituent of the benchmark but shall be disclosed at an aggregated weighted average value of the benchmark.	
a) List of combined ESG factors[5]:	Mandatory disclosures of ESG factors as listed in Annex II, for each Benchmark in the Paris- Aligned and Climate- Transition Fixed Income Benchmark family, is available here.
b) List of environmental factors[6]:	Mandatory disclosures of environmental factors as listed in Annex II, for each Benchmark in the Paris- Aligned and Climate- Transition Fixed Income Benchmark family, is available here.

[1] The mandatory factors listed in the UK BMR and EU BMR Benchmark Statement Delegated Act as set out in *Annex II* are not taken into account in the methodology for the benchmarks and information on these mandatory factors is provided for reference purposes only.
[2] The mandatory factors listed in the UK BMR and EU BMR Benchmark Statement Delegated Act as set out in *Annex II* are not taken into account in the methodology for the benchmarks and information on these mandatory factors is provided for reference purposes only.
[3] The mandatory factors listed in the UK BMR and EU BMR Benchmark Statement Delegated Act as set out in *Annex II* are not taken into account in the methodology for the benchmarks and information on these mandatory factors is provided for reference purposes only.
[4] The mandatory factors listed in the UK BMR and EU BMR Benchmark Statement Delegated Act as set out in *Annex II* are not taken into account in the methodology for the benchmarks and information on these mandatory factors is provided for reference purposes only.
[5] The mandatory factors listed in the UK BMR and EU BMR Benchmark Statement Delegated Act as set out in *Annex II* are not taken into account in the methodology for the benchmarks and information on these mandatory factors is provided for reference purposes only.
[6] The mandatory factors listed in the UK BMR and EU BMR Benchmark Statement Delegated Act as set out in *Annex II* are not taken into account in the methodology for the benchmarks and information on these mandatory factors is provided for reference purposes only.

c) List of social factors[7]:	Mandatory disclosures of social factors as listed in Annex II, for each Benchmark in the Paris- Aligned and Climate- Transition Fixed Income Benchmark family, is available here.
d) List of governance factors[8]:	Mandatory disclosures of governance factors as listed in Annex II, for each Benchmark in the Paris- Aligned and Climate- Transition Fixed Income Benchmark family, is available here
Hyperlink to the information on ESG factors for each benchmark:	Mandatory disclosures of ESG factors as listed in Annex II, for each Benchmark in the Paris- Aligned and Climate- Transition Fixed Income Benchmark family, is available here.
8. Data and standards used	
a) Description of data sources used to provide information on the ESG factors in the benchmark statement. Describe how the data used to provide information on the ESG factors in the benchmark statement are sourced and whether, and to what extent, data are estimated or reported.	Annex II disclosures have been calculated by the Benchmark Administrator using third party ESG data from the International Energy Agency, Morningstar Sustainalytics and Moody's ESG. Please refer to the Definitions Table of Annex II (here) for more information. The Administrator maintains appropriate oversight of all data sourced from ESG providers involved in the Benchmark determination process. As part of this oversight function, the Administrator has implemented (i) automated controls that allow the Administrator to regularly assess changes in ESG data provided by third party vendors, and (ii) manual reviews in the form of regular meetings (at the beginning and at the end of each month) where the ESG data is appropriately assessed and approved by the Administrator's personnel for purposes of re-weighting and calculating the Benchmarks. Additionally, the Administrator undertakes the verification and validation of ESG data on an ad-hoc basis by comparing it with historic ESG data that the Administrator's personnel receive through automated reports. GHG emissions data for each issuer (Issuer Emissions) is sourced from Moody's. The GHG emissions include scope 1, 2 and 3 emissions and is calculated as tonnes of carbon dioxide equivalent (tCO_2e). Issuers with no reported or estimated emissions (across scope 1, 2 and 3) provided by Moody's are estimated by JP Morgan using a rules-based waterfall logic, outlined in the J.P. Morgan Paris-Aligned and Climate-Transition Benchmark Rules and Methodology, available here.
b) Reference standards. List the supporting standards used for the reporting under item 6 and/or item 7.	The ESG methodology of the Benchmark Administrator's Paris- Aligned and Climate- Transition Fixed Income Benchmarks integrates the United Nations Global Compact Principles (UNGC).
SECTION 2 - ADDITIONAL DISCLOSURE REQUIREMENTS FOR EU CLIMATE-TRANSITION BENCHMARKS, UK CLIMATE-TRANSITION BENCHMARKS, EU PARIS-ALIGNED BENCHMARKS AND UK PARIS-ALIGNED BENCHMARKS	
9. Where a benchmark is labelled as 'EU Climate Transition Benchmark', 'UK Climate Transition Benchmark', 'EU Paris-aligned Benchmark' or 'UK Paris-aligned Benchmark', benchmark administrators shall also disclose the following information:	
a) forward-looking year-on-year decarbonisation trajectory	The forward-looking year-on-year decarbonisation trajectory for each Benchmark in the Paris- Aligned and Climate- Transition Fixed Income Benchmark family can be found in the J.P. Morgan Benchmark Statement Annex II PAB/CTB Disclosures, available here.
b) degree to which the IPCC decarbonisation trajectory (1.5 C with no or limited overshoot) has been achieved on average per year since creation;	Details of the achievement of the IPCC decarbonisation trajectory for each Benchmark in the Paris- Aligned and Climate- Transition Fixed Income Benchmark family can be found in the J.P. Morgan Benchmark Statement Annex II PAB/CTB Disclosures, available here.
c) overlap between those benchmarks and their investable universe, as defined in the relevant delegated legislation under EU BMR or UK BMR, using the active share at relevant underlying asset level.	The overlap between these Benchmarks and their investable universe for each Benchmark in the Paris- Aligned and Climate- Transition Fixed Income Benchmark family can be found in the J.P. Morgan Benchmark Statement Annex II PAB/CTB Disclosures, available here.
SECTION 3 - DISCLOSURE OF THE ALIGNMENT WITH THE OBJECTIVES OF THE PARIS AGREEMENT	
10. By the date of application of the relevant delegated legislation under EU BMR or UK BMR, for significant equity and bond benchmarks, EU Climate Transition Benchmarks, UK Climate Transition Benchmarks, EU Paris-aligned Benchmarks and UK Paris-aligned Benchmarks, benchmark administrators shall also disclose the following information. By 31 December 2021, benchmark administrators shall, for each benchmark or, where applicable, each family of benchmarks, disclose the following information:	

[7] The mandatory factors listed in the UK BMR and EU BMR Benchmark Statement Delegated Act as set out in *Annex II* are not taken into account in the methodology for the benchmarks and information on these mandatory factors is provided for reference purposes only.

[8] The mandatory factors listed in the UK BMR and EU BMR Benchmark Statement Delegated Act as set out in *Annex II* are not taken into account in the methodology for the benchmarks and information on these mandatory factors is provided for reference purposes only.

a) Does the benchmark align with the target of reducing carbon emissions or the attainment of the objectives of the Paris Agreement;	Yes. Climate Transition Benchmarks align with the target of reducing carbon emissions. Paris-aligned Benchmarks align with the attainment of the objectives of the Paris Agreement.
b) the temperature scenario, in accordance with international standards, used for the alignment with the target of reducing GHG emissions or attaining of the objectives of the Paris Agreement;	The Benchmarks use the reference 1.5 °C temperature scenario with no or limited overshoot, referred to in the Special Report on Global Warming of 1,5 °C from the Intergovernmental Panel on Climate Change ("IPCC") as the reference temperature scenario.
c) the name of the provider of the temperature scenario used for the alignment with the target of reducing GHG emissions or the attainment of the objectives of the Paris Agreement	The Special Report on Global Warming of 1.5 °C from the Intergovernmental Panel on Climate Change (the "IPCC").
d) the methodology used for the measurement of the alignment with the temperature scenario;	Terms not defined below are defined within the J.P. Morgan Paris-Aligned and Climate-Transition Benchmark Rules and Methodology, available here. **Index Construction** **1. Define Data Inputs** GHG emissions data for each issuer (Issuer Emissions) is sourced from Moody's. The GHG emissions include scope 1, 2 and 3 emissions and is calculated as tonnes of carbon dioxide equivalent (tCO2e). Issuers with no reported or estimated emissions (across scope 1, 2 and 3) are estimated using a waterfall logic. For more information on the data inputs, please refer to the Data Sources and Scope section below. **Emissions waterfall logic** As GHG emissions are an essential input to the JPM PAB and JPM CTB Index methodologies, JPM will apply a waterfall logic to estimate emissions where they are missing from Moody's. If a corporate issuer is not covered by Moody's, a regional-sector average is utilised to estimate emissions using the data available from Moody's on the other relevant issuers. For this calculation, scope 1 and 2 emissions are grouped together, and scope 3 emissions are considered separately. The regional-sector average is calculated by JPM at the issuer level as needed (e.g. if only scope 1 and 2 is missing, then the regional-sector average of scope 1 and 2 emissions will be applied) and will only be used when the region-sector grouping has at least two issuers. If the region-sector grouping has fewer than two issuers, a regional average will be used. The region and sector designation for the issuer will be taken from its index classification in the Parent Index, as detailed in the relevant JPM PAB or JPM CTB Index Factsheet here. **2. Calculate Parent Index Emissions** For the respective Parent Index, the Parent Index Emissions is calculated using the absolute GHG emissions in tCO_2e of each issuer and their index weight in the Parent Index. The Parent Index Emissions is calculated as the weighted average absolute emissions, as follows: $Parent\ Index\ Emissions = \sum_{i=0}^{n} Issuer\ M\ kv\ \%_i * Issuer\ Emissions_i$ **3. Apply Exclusions** Once the requisite exclusions have been applied, a 3% cap on an issuer's weight is applied and the Index Emissions of the resulting JPM PAB or JPM CTB Index are recalculated using the weighted average formula, as follows:

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$$JPM\ PAB\ or\ JPM\ Index\ Emissions = \sum_{i=0}^{n} Issuer\ M\ kv\ \%_i * Issuer\ Emissions_i$$

4. Calculate Base Year Emission Target and Annual Emissions Targets
At inception of the Index, the Base Year, the JPM PAB and JPM CTB Index Base Year Emission Target, shall be at least 50% and 30% lower, respectively, than the Parent Index Emissions, defined for each JPM PAB and JPM CTB Index.

$$JPM\ PAB\ Index\ Base\ Year\ Emissions\ Target = JPM\ PAB\ Index\ Base\ Year\ Emissions \leq Parent\ Index\ Base\ Year\ Emissions * 50\%$$

$$JPM\ CTB\ Index\ Base\ Year\ Emissions\ Target = JPM\ CTB\ Index\ Base\ Year\ Emissions \leq Parent\ Index\ Base\ Year\ Emissions * 70\%$$

In addition, both JPM PAB and JPM CTB Indices target an annual 7% geometric decarbonisation from their respective Index Base Year Emissions level.
The Annual Emissions Targets define the annual level of JPM PAB or JPM CTB Index Emissions that must be met in subsequent years, in order to maintain the 7% Decarbonisation Trajectory. The Annual Emissions Targets will be achieved through a twice yearly rebalance process.

5. Define High Emission and Low Emission Buckets
Issuers are divided into two emission buckets: (i) High Emission Bucket and (ii) Low Emission Bucket, based on their contribution to the JPM PAB or JPM CTB Index Emissions. In some cases, due to the structure of market emissions, a third Very High Emissions Bucket may be included, which is detailed in the relevant JPM PAB or JPM CTB Index Factsheet. J.P. Morgan Index Factsheets can be found here. The level of Contribution (%) to Index Emissions required to qualify for the High Emissions Bucket is reviewed and defined at each semi-annual rebalance, to reduce turnover.

An issuer's contribution (Contribution %) to the JPM PAB or JPM CTB Index Emissions is calculated as follows:

$$Contribution\ \% = \frac{(Issuer\ Mkv\ \% * Issuer\ Emissions)}{JPM\ PAB\ or\ JPM\ CTB\ Index\ Emissions}$$

The Initial Emissions Bucket weight is the resulting sum of all issuer weights within that bucket, for example:

$$Initial\ Emissions\ Bucket\ Weight = \sum_{i=0}^{n} Issuer\ M\ kv\ \%_i$$

The Emissions of each Emissions Bucket can be calculated as the weighted average of all issuer emissions within that bucket, for example:

$$Bucket\ Emissions = \sum_{i=0}^{n} Issuer\ M\ kv\ \%_i * Issuer\ Emissions_i$$

The High Emissions and Low Emissions Buckets are assigned an overall weight, which is used to determine the issuers' resulting weights in the JPM PAB or JPM CTB Index. The weight of each bucket is determined by applying a Multiplier, which is described in Section 6 below.

6. Calculate Multipliers and Apply Integration Mechanics
The JPM PAB and JPM CTB Index Base Year Emissions Target and the Annual Emissions Targets are achieved by applying a Multiplier to both the High Emission and Low Emission Buckets, such that the weights of each bucket when combined together create an index product meeting the required JPM PAB

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and JPM CTB Index Base Date Emissions Target and the Annual Emissions Targets.

If the JPM PAB or JPM CTB Index Emissions do not meet the required Base Year Emissions Target purely through the application of Baseline Exclusions and Activity Exclusions, then the weight of the High Emission Bucket will be set such that when combined with the Low Emission Bucket, the overall JPM PAB or JPM CTB Index Emissions is lower than or equal to the JPM PAB or JPM CTB Index Base Date Emissions Target.

The Multipliers used to determine the weights of the Emission Buckets are calculated using an optimization function that uses the Initial Emission Bucket weights and Bucket Emissions. The optimizer function uses a set of defined constraints to calculate the required Multipliers to meet the Decarbonisation Trajectory.

Constraints:

1. $JPM\ PAB\ Index\ Emissions \leq \min\left(Parent\ Index\ Annual\ Emissions\ Target,\ JPM\ PAB\ Annual\ Index\ Emissions\ Target\right)$
2. $Emission\ Bucket\ Weight_{(low)} \geq Initial\ Emission\ Bucket\ Weight_{(low)}$
3. $\sum(Emission\ Bucket\ Weights) = 100\%$

Constraints 1 & 2 force the optimizer to only increase the weights of the Low Emissions Bucket when the JPM PAB or JPM CTB Index Emissions are above the Annual Emission Target. If the JPM PAB or JPM CTB Index Emissions are below the Annual Emission Target the results of the optimizer are the Initial emission bucket weights, this prevents the High Emissions Bucket increasing in weight.

Constraint 3 requires the index weight to remain at 100% after the optimization. If the optimizer fails, the Low, High and Very High Emissions Buckets will need to re-defined to allow the JPM PAB or JPM CTB Index Emissions to meet the Decarbonisation Trajectory.

The required Annual Emission Targets are then met each year by reducing the multiplier applied to the High Emission Bucket, meaning that the relative weight of the High Emission Bucket can be gradually reduced over time to result in a reduction in the JPM PAB or JPM CTB Index Emissions in line with the projections. The following formula illustrates these constraints for a JPM PAB Index:

$$[Multiplier_{(High\ Emitter\ Bucket)} * Bucket\ Emissions_{(High\ Emitter\ Bucket)} + Multiplier_{(Low\ Emitter\ Bucket)} * Bucket\ Emissions_{(Low\ Emitter\ Bucket)}] \leq \min\left(JPM\ PAB\ Index\ Emissions_{t0} * (1-7\%)^n,\ 0.5 * Parent\ Index\ Emissions\right), \text{ where n is number of years.}$$

Objective

$$Issuer\ Mkv\ \%_{(High\ Emitter\ Bucket)} + Issuer\ Mkv\ \%_{(Low\ Emitter\ Bucket)} = 100\%$$

To reduce turnover between the High Emission and the Low Emission Buckets due to changes in issuance or emissions, the entry threshold will be set higher than the exit threshold for eligibility, i.e. 5% for entry into the High Emission Bucket, 3.5% for any subsequent switch from High Emission Bucket to Low Emission Bucket. For more information, see the Rebalancing Rules below.

7. Calculate New Index Weights

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	Issuer weights are assigned by renormalizing relative to the total High Emission Bucket and Low Emission Bucket weights. For example, if the total index weight of issuers in the High Emission Bucket is 35% and the allowable weight of the High Emission Bucket is set at 20% after the Multiplier is applied, then the final market value for each issuer will be determined by multiplying its weight by 20/35. This calculated market value determines the weight of each constituent in the final JPM PAB or JPM CTB Index. **8. Calculate Index Total Return Using New Index Weights** If a bond is in the High Emissions bucket, and has a notional amount of 1 billion USD, then it needs to be scaled down by multiplying by 20/35 in the previous example, giving an adjusted notional amount: $1{,}000{,}000{,}000 * 20/35 = 571{,}428{,}571$ Bond Market Value(t) = Bond Dirty Price(t) * Bond Notional Amount (Adjusted as above) $Bond\ Total\ Return_{(t+1)} = \frac{Bond\ Dirty\ Price_{(t+1)} * \ Bond\ Notional\ Amount}{Bond\ Dirty\ Price_{t} * \ Bond\ Notional\ Amount}$ The Index Total Return on day t+1 is calculated as the sumproduct of these Bond Total Returns (t+1), weighted by their Bond Market values on day t' The Bond Dirty Price is the Clean price provided by Pricing Direct as input data into the returns calculation plus accrued interest as calculated by the bond definitions. **Semi-Annual Rebalance Events** Each JPM PAB Index and JPM CTB Index is rebalanced semi-annually at January month-end and July month-end to ensure that the JPM PAB Index Emissions or JPM CTB Index Emissions meet the required Annual Emissions Targets. Please see the J.P. Morgan Paris-Aligned and Climate-Transition Benchmark Rules and Methodology for more information, available here.
e) the hyperlink to the website of the temperature scenario used;	https://www.ipcc.ch/sr15/
Date on which information has last been updated and reason for the update:	November 2024.

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