



BNP PARIBAS
CORPORATE & INSTITUTIONAL BANKING

BNP PARIBAS INDICES
INDEX METHODOLOGY SUPPLEMENT
BNP Paribas Rolling Futures W0 TZ Index

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This document (the “**BNP Paribas Index Methodology Supplement**”) supplements, forms a part of and is subject to the BNP Paribas Index Handbook (the “**Handbook**”), as may be amended, supplemented, replaced or superseded from time to time. The current version of the Handbook and all supplements thereto may be downloaded from <https://indx.bnpparibas.com/>.

The Handbook, this BNP Paribas Index Methodology Supplement and any Technical Annex, Disclosure Annex or other document that by its terms applies to certain features of a particular BNP Paribas Index together comprise the “**BNP Paribas Index Rules**” for each BNP Paribas Index described herein. In the event of an inconsistency, the following order of precedence will prevail for the purposes of each BNP Paribas Index described herein: (i) this BNP Paribas Index Methodology Supplement, (ii) a supplement, Technical Annex, Disclosure Annex or other document that does not form part of the Handbook, but is incorporated by reference and by its terms applies to certain features of each BNP Paribas Index described herein, and (iii) the Handbook. Terms used herein, but not defined, bear the meaning set forth in the Handbook, any supplement thereto, or in any applicable Technical Annex or Disclosure Annex. In the event of any inconsistency between any narrative description below of the provisions (including calculations) of any annex of this BNP Paribas Index Methodology Supplement and the actual provisions set forth in such annex, the provisions in such annex will prevail.

In this BNP Paribas Index Methodology Supplement, references to Section numbers shall be deemed to be references to Sections appearing in Annex 1 unless otherwise specified.

The BNP Paribas Index Rules will be made available upon request and, if applicable, subject to confidentiality or other agreements between BNP Paribas and the relevant party. Any information provided with respect to a BNP Paribas Index or the BNP Paribas Index Rules is provided on a confidential basis and solely for information purposes. By accepting a copy of the BNP Paribas Index Rules, you agree that you will not disclose, reproduce, redistribute or transmit, in whole or in part, the BNP Paribas Index Rules without the written consent of the Index Sponsor.

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Nothing contained in the BNP Paribas Index Rules should be construed as an offer or solicitation of any transaction.

Objective of the BNP Paribas Indices

The objective of the BNP Paribas Rolling Futures W0 TZ Index (the “**BNP Paribas Index**”) and the strategy and methodology related thereto (the “**BNP Paribas Index Methodology**”) is to provide continuous exposure to futures contracts (each a “**Futures Contract**”) traded on the Index Component.

Calculation of the BNP Paribas Index Level

On each BNP Paribas Index Level Calculation Date, the Index Calculation Agent calculates the BNP Paribas Index Level for each BNP Paribas Index in accordance with the provisions of the relevant BNP Paribas Index Rules and as described below.

The BNP Paribas Index Level is calculated as the sum of (i) the Next Futures Contract Number of Shares (as defined below) on the immediately preceding BNP Paribas Index Level Calculation Date, multiplied by the Settlement Price of the Next Futures Contract and (ii) the Lead Futures Contract Number of Shares (as defined below) on the immediately preceding BNP Paribas Index Level Calculation Date, multiplied by the Settlement Price of the Lead Futures Contract.

Description of the BNP Paribas Index Methodology

The BNP Paribas Indices implement a standard roll methodology by which a position in the Lead Futures Contract is replaced by the Next Futures Contract in one of the next available delivery months, by synthetically replacing the Lead Futures Contract with the Next Futures Contract incrementally. This replacement is performed during the period from the Roll Start Date to the Roll End Date of the corresponding Index Component. This process is repeated on a monthly basis as the invested contracts near expiry.

The Lead Futures Contract and the Next Futures Contract are determined in accordance with the matrix of contracts specified as the Next Futures Contract for each Index Component and in respect of each calendar month as provided in Table 2 (*Matrix of Next Futures Contracts*) of Annex 2.

The Next Futures Contract follows a front-month rolling schedule where the Next Futures Contract is changed every month in order for the BNP Paribas Indices to remain invested in the futures contract on the first available nearby expiry.

The “**Next Futures Contract Number of Shares**” is calculated as the Roll Weight multiplied by the ratio of (i) the BNP Paribas Index Level divided by (ii) the Settlement Price of the Next Futures Contract.

The “**Lead Futures Contract Number of Shares**” is calculated as the product of (i) one (1) minus the Roll Weight multiplied by (ii) the result of (a) the BNP Paribas Index Level divided by (b) the Settlement Price of the Lead Futures Contract.

The “**Roll Weight**” is determined as follows:

- (a) If the BNP Paribas Index Level Calculation Date falls before the Roll Period of the calendar month, then the Roll Weight is equal to 0; or
- (b) If the BNP Paribas Index Level Calculation Date falls within the Roll Period of the calendar month then:
 - If (1) the BNP Paribas Index Level Calculation Date is a New York Business Day and (2) no Limit Price Event has occurred in respect of either the Next Futures Contract or the Lead Futures Contract, then:
 - i. On the Roll Period Start Date of the calendar month, the Roll Weight is equal to 0.1;
 - ii. On the second New York Business Day of the calendar month, the Roll Weight is equal to 0.2;
 - iii. On the third New York Business Day of the calendar month, the Roll Weight is equal to 0.3;
 - iv. On the fourth New York Business Day of the calendar month, the Roll Weight is equal to 0.4;
 - v. On the fifth New York Business Day of the calendar month, the Roll Weight is equal to 0.5;
 - vi. On the sixth New York Business Day of the calendar month, the Roll Weight is equal to 0.6;
 - vii. On the seventh New York Business Day of the calendar month, the Roll Weight is equal to 0.7;
 - viii. On the eighth New York Business Day of the calendar month, the Roll Weight is equal to 0.8;
 - ix. On the ninth New York Business Day of the calendar month, the Roll Weight is equal to 0.9; and
 - x. On the Roll Period End Date of the calendar month, the Roll Weight is equal to 1.
 - Otherwise, the Roll Weight is equal to the Roll Weight on the immediately preceding BNP Paribas Index Level Calculation Date.
- (c) If the BNP Paribas Index Level Calculation Date falls after the Roll Period of the calendar month, then the Roll Weight is equal to 1.

The Index Components

The BNP Paribas Index is comprised of a synthetic portfolio of assets. There is no actual portfolio of assets to which any person is entitled or has any ownership interest. The BNP Paribas Index does not entail the actual execution of any transactions with respect to the Index Components. The BNP Paribas Index Methodology synthetically replicates all of the referenced Index Components and any related transactions.

The BNP Paribas Index is comprised of Futures Contracts traded on a commodity (the "**Index Component**"). The Index Component for the BNP Paribas Index is:

ICE Dutch TTF Natural Gas Futures Contracts traded on the Inter-Continental Exchange (the "ICE").

Further information on Futures Contracts traded on the ICE can be found on the ICE website (<http://www.theice.com>).

Further details are as set forth in Table 1 (*Index Components*) of Annex 2.

BNP Paribas Index Definitions

BNP Paribas Index:	BNP Paribas Rolling Futures W0 TZ Index <BNPIW0TZ Index>	
BNP Paribas Index Launch Date	@LAUNCH_DATE@	
BNP Paribas Index Start Date	@START_DATE@	
Index Calculation Agent:	BNP Paribas Financial Markets SNC Unless otherwise indicated, all calculations and determinations set forth in this BNP Paribas Index Methodology Supplement are performed by the Index Calculation Agent.	
Weighting Determination Agent:	Not Applicable	
BNP Paribas Index Status:	Public Index	
Benchmark Family:	Commodities	
Index Currency:	USD	
BNP Paribas Index Features		
Return Type:	Excess Return	
Rebalancing:	Applicable, see Annex 1 hereto.	
Weighting Determination Dates:	Not Applicable	
Rebalancing Dates:	Rebalancing Dates shall be each Scheduled Trading Day from and including the Roll Period Start Date, to and including the Roll Period End Date.	
Index Fees:	Not Applicable.	
Optional Filters:	Average Daily Trading Volume:	Not Applicable
	Median Daily Trading Volume:	Not Applicable
	Hard to Borrow:	Not Applicable
	Additional Filter:	Not Applicable
Currency Conversion Mechanism:	Not Applicable.	
Volatility Control Mechanism:	Not Applicable.	
Calculation and Publication of the BNP Paribas Index Level:		

Initial BNP Paribas Index Level:	100 as of the BNP Paribas Index Start Date.
Frequency of calculation of BNP Paribas Index Level:	Once per day, on each BNP Paribas Index Level Calculation Date.
Scheduled BNP Paribas Index Business Day:	Each day that is a Scheduled Trading Day for each Index Component.
BNP Paribas Index Level Calculation Date:	Each Scheduled BNP Paribas Index Business Day on which the Index Calculation Agent calculates the BNP Paribas Index Level.
Scheduled Trading Day:	As defined in the Handbook.
BNP Paribas Index Publication Date:	The Business Day following each BNP Paribas Index Level Calculation Date.
BNP Paribas Index Publication Page:	Bloomberg page BNPIW0TZ <Index>
Website where current composition of the BNP Paribas Index is published:	indx.bnpparibas.com
Price Disrupted Days:	
Please see Section 4.3 (<i>Price Disrupted Days</i>) of the Handbook.	
Consequence of Price Source Disruption:	
The Index Calculation Agent shall calculate the BNP Paribas Index Level using the Last Available Settlement Price for the affected Index Component.	
Rebalancing Disruption:	
Please see Section 4.4 (<i>Consequence of Rebalancing Disruption</i>) of the Handbook.	
Consequence of Rebalancing Disruption:	
Section 2 (<i>Calculation of the Roll Weight</i>) shall apply.	
Continuing Disruption:	
The “ Maximum Number of Days of Disruption ” with respect to (i) a Price Source Disruption shall be five (5) Scheduled BNP Paribas Index Business Days; and (ii) a Rebalancing Disruption shall be ten (10) Scheduled BNP Paribas Index Business Days.	
Index Adjustment Events:	
Section 5 (<i>Index Adjustment Events and Consequences</i>) of the Handbook shall apply.	

Index Potential Adjustment Events:

Not Applicable.

Technical or Disclosure Annexes applicable to the BNP Paribas Index:

Not Applicable.

Amended definitions and provisions applicable to the BNP Paribas Index:

The defined terms in the Master Definitions Annex of the Handbook below shall be replaced as follows:

“BNP Paribas Index Level Calculation Date” means, with the respect to each BNP Paribas Index, any day that is a Scheduled Trading Day for the corresponding Index Component.

New definitions and provisions applicable to the BNP Paribas Index:

“Lead Futures Contract” means, in respect of any BNP Paribas Index Level Calculation Date and each Index Component, the Next Futures Contract for the immediately preceding calendar month.

“Next Futures Contract” means, in respect of any BNP Paribas Index Level Calculation Date and each Index Component, the next futures contract determined in accordance with Table 2 (*Matrix of Next Futures Contracts*) of Annex 2.

“Roll Period” means, in respect of a calendar month, the period from and including the Roll Period Start Date to and including the Roll Period End Date.

“Roll Period End Date” means the 10th New York Business Day of each calendar month.

“Roll Period Start Date” means the 1st New York Business Day of each calendar month.

Bespoke provisions applicable to the BNP Paribas Index:

Not Applicable.

Date offsets:

Unless otherwise specified in the BNP Paribas Index Methodology Supplement, for any BNP Paribas Index Level Calculation Date t , and for any integer value j , $t + j$ (respectively $t - j$) refers to the BNP Paribas Index Level Calculation Date that is j BNP Paribas Index Level Calculation Dates following (respectively preceding) BNP Paribas Index Level Calculation Date t . For example, $t - 1$ refers to the BNP Paribas Index Level Calculation Date immediately preceding BNP Paribas Index Level Calculation Date t , and $t - 2$ refers to the BNP Paribas Index Level Calculation Date immediately preceding BNP Paribas Index Level Calculation Date $t - 1$.

Annex 1

The BNP Paribas Index Methodology for the BNP Paribas Rolling Futures W0 TZ Index:

On each BNP Paribas Index Level Calculation Date, the following calculations and determinations will be made by the Index Calculation Agent for each of the BNP Paribas Indices:

1. BNP Paribas Index Level Calculation:

On the BNP Paribas Index Start Date ($t = 0$):

$$Index_{t_0} = 100$$

Thereafter, the BNP Paribas Index Level ($Index_t$) shall be determined in accordance with the following formula:

$$Index_t = Index_{t_R} \times \left(RW_{t_R} \times \frac{NCP_t}{NCP_{t_R}} + (1 - RW_{t_R}) \times \frac{LCP_t}{LCP_{t_R}} \right)$$

Where:

- t_R means the BNP Paribas Index Level Calculation Date immediately preceding BNP Paribas Index Level Calculation Date t on which no Limit Price Event has occurred with respect to either the Next Futures Contract or the Lead Futures Contract;
- RW_t means the Roll Weight on BNP Paribas Index Level Calculation Date t , calculated in accordance with the provisions of Section 2 (*Calculation of the Roll Weight*);
- NCP_t means the Settlement Price of the Next Futures Contract on BNP Paribas Index Level Calculation Date t ; and
- LCP_t means the Settlement Price of the Lead Futures Contract on BNP Paribas Index Level Calculation Date t

2. Calculation of the Roll Weight:

On each BNP Paribas Index Level Calculation Date t , the Roll Weight (RW_t) shall be calculated in accordance with the following provisions:

- (a) If BNP Paribas Index Level Calculation Date t falls within the Roll Period of the calendar month, then:
 - (i) If BNP Paribas Index Level Calculation Date t is (1) a New York Business Day, and (2) not a Rebalancing Disrupted Day, in each case in respect of the Next Futures Contract or the Lead Futures Contract, then:
 - In respect of the Roll Period Start Date, RW_t is equal to 0.1;
 - In respect of the second (2nd) New York Business Day of the calendar month, then RW_t is equal to 0.2;
 - In respect of the third (3rd) New York Business Day of the calendar month, then RW_t is equal to 0.3;
 - In respect of the fourth (4th) New York Business Day of the calendar month, then RW_t is equal to 0.4;
 - In respect of the fifth (5th) New York Business Day of the calendar month, then RW_t is equal to 0.5;
 - In respect of the sixth (6th) New York Business Day of the calendar month, then RW_t is equal to 0.6;

- In respect of the seventh (7th) New York Business Day of the calendar month, then RW_t is equal to 0.7;
- In respect of the eight (8th) New York Business Day of the calendar month, then RW_t is equal to 0.8;
- In respect of the ninth (9th) New York Business Day of the calendar month, then RW_t is equal to 0.9; and
- In respect of the tenth (10th) New York Business Day of the calendar month, then RW_t is equal to 1.

(ii) Otherwise:

$$RW_t = RW_{t-1}$$

(b) If the BNP Paribas Index Level Calculation Date t falls after the Roll Period of the calendar month, then

$$RW_t = 1$$

Annex 2

Table 1 –Index Components

Index Component	Type	Index Component Currency	Price Source	Pricing Page
ICE Dutch TTF Natural Gas Futures	Commodity	USD	ICE	www.theice.com

Table 2 – Matrix of Next Futures Contracts

	Month											
Futures Contract	January	February	March	April	May	June	July	August	September	October	November	December
ICE Dutch TTF Natural Gas Futures	H0	J0	K0	M0	N0	Q0	U0	V0	X0	Z0	F1	G1

Where the first character of the code corresponds to the expiration month of the Next Futures Contract (“F” for January, “G” for February, “H” for March, “J” for April, “K” for May, “M” for June, “N” for July, “Q” for August, “U” for September, “V” for October, “X” for November, and “Z” for December), and the second character corresponds to the expiration year of the Next Futures Contract relative to the current year. For example, in 2017, a futures contract which was denoted as “Z1” refers to the futures contract expiring in December 2018, while in 2018 the same futures contract “Z1” refers to the futures contract expiring in December 2019.