

# Bloomberg Multi-Tenor Indices

Index Methodology

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## Section 1: Index Overview

The Bloomberg Multi-Tenor Indices aims to track the performance of an equal-weight basket with 3 tenors of commodity futures contracts (Brent Crude Oil, Natural Gas, and WTI Crude Oil) beyond the nearby contract, as depicted in Table 3. There are two Total Return versions calculated, one using the returns of the underlying excess return index and the return of cash collateral invested in the 3-Month T-Bill, and the second using the U.S. Treasury 4-Week Bill Low Discount Rate.

**Table 1: USD Multi-Tenor Indices**

Index Names (USD)	Ticker	Currency	Rebalance Day	Roll Days	Index Commencement Date
Bloomberg Brent Crude Oil Multi-Tenor ER Index	BCOMTER	USD	4th Business Day of Month	Business Day 5-9	October 16, 2020
Bloomberg Brent Crude Oil Multi-Tenor TR Index	BCOMTTR	USD	4th Business Day of Month	Business Day 5-9	October 16, 2020
Bloomberg Natural Gas Multi-Tenor ER Index	BNGMTER	USD	Last Business Day of Month	Business Day 1-10	October 16, 2020
Bloomberg Natural Gas Multi-Tenor TR Index	BNGMTTR	USD	Last Business Day of Month	Business Day 1-10	October 16, 2020
Bloomberg WTI Crude Oil Multi-Tenor ER Index	BCLMTER	USD	4th Business Day of Month	Business Day 5-9	June 4 <sup>th</sup> 2020
Bloomberg WTI Crude Oil Multi-Tenor TR Index	BCLMTTR	USD	4th Business Day of Month	Business Day 5-9	June 4 <sup>th</sup> 2020
Bloomberg WTI Crude Oil Multi-Tenor 4 Week TR Index	BCLMT4T	USD	4th Business Day of Month	Business Day 5-9	March 22nd 2024

The Index weights are reset equally on a monthly basis. To maintain the long position of the basket, contracts are 'rolled' from the expiring futures contract to a new contract farther down the futures curve with a longer expiry date. All commodities will roll on the sixth through the tenth Business Day of each calendar month. An **Index Level** or Business Day is determined on a day in which NYMEX is open for trading.

The Bloomberg Multi-Tenor Indices are denominated in U.S. dollars and in daily hedged versions (EUR & GBP). The Indices have a **Base Date** of January 4th, 2010 with a **Base Index Level** of 100.

**Table 2: Daily Hedged Multi-Tenor Indices**

Index Names (Daily Hedged)	Ticker	Currency	Index Commencement Date
Bloomberg Brent Crude Oil Multi-Tenor EUR-Hedged Daily ER Index	BCOMTERE	EUR	October 16, 2020
Bloomberg Brent Crude Oil Multi-Tenor EUR-Hedged Daily TR Index	BCOMTTRE	EUR	October 16, 2020
Bloomberg Brent Crude Oil Multi-Tenor GBP-Hedged Daily ER Index	BCOMTERP	GBP	October 16, 2020
Bloomberg Brent Crude Oil Multi-Tenor GBP-Hedged Daily TR Index	BCOMTTRP	GBP	October 16, 2020
Bloomberg Natural Gas Multi-Tenor EUR-Hedged Daily ER Index	BNGMTERE	EUR	October 16, 2020
Bloomberg Natural Gas Multi-Tenor EUR-Hedged Daily TR Index	BNGMTTRE	EUR	October 16, 2020
Bloomberg WTI Crude Oil Multi-Tenor EUR-Hedged Daily ER Index	BCLMTERE	EUR	October 16, 2020
Bloomberg WTI Crude Oil Multi-Tenor EUR-Hedged Daily TR Index	BCLMTTRE	EUR	October 16, 2020
Bloomberg WTI Crude Oil Multi-Tenor GBP-Hedged Daily ER Index	BCLMTERP	GBP	October 16, 2020
Bloomberg WTI Crude Oil Multi-Tenor GBP-Hedged Daily TR Index	BCLMTTRP	GBP	October 16, 2020

The Bloomberg Multi-Tenor Indices are the intellectual property of Bloomberg Index Services Limited (**BISL** and, collectively with its affiliates, Bloomberg), in such capacity as, the **"Index Owner"**.

**Table 3: Target Weights and Tenors**

<b>Commodity</b>	<b>Bloomberg Code</b>	<b>Tenor Month on Curve</b>	<b>Target Weight</b>	<b>Lot Size</b>
Brent Crude Oil	CO	CO-F1	1/3 or 33.33%	1
Brent Crude Oil	CO	CO-F2	1/3 or 33.33%	1
Brent Crude Oil	CO	CO-F3	1/3 or 33.33%	1
Crude Oil (WTI)	CL	CL-F1	1/3 or 33.33%	1
Crude Oil (WTI)	CL	CL-F2	1/3 or 33.33%	1
Crude Oil (WTI)	CL	CL-F3	1/3 or 33.33%	1
Natural Gas	NG	NG-F1	1/3 or 33.33%	1
Natural Gas	NG	NG-F2	1/3 or 33.33%	1
Natural Gas	NG	NG-F3	1/3 or 33.33%	1

## Section 2: Index Limitations

Though the Indices are designed to be representative of the markets they measure or otherwise align with their stated objective, they may not be representative in every case or achieve their stated objective in all instances. They are designed and calculated strictly to follow the rules of this Methodology, and any Index Level or other output is limited in its usefulness to such design and calculation.

Markets can be volatile, including those commodity market interests which the Indices intend to measure or upon which the Indices are dependent in order to achieve their stated objective. For example, trading in futures contracts on physical commodities, including trading in the Index components, is speculative and can be extremely volatile. Market prices of the Index components and the underlying physical commodities may fluctuate rapidly based on numerous factors, including changes in supply and demand relationships (whether actual, perceived, anticipated, unanticipated or unrealized); weather; agriculture; trade; fiscal, monetary and exchange control programs; domestic and foreign political and economic events and policies; disease; pestilence; technological developments; changes in interest rates, whether through government action or market movements; and monetary and other government policies, action and inaction.

The current or "spot" prices of the underlying physical commodities may also affect, in a volatile and inconsistent manner, the prices of futures contracts in respect to the relevant commodity. These factors may affect the value of the Indices in varying ways, and different factors may cause the prices of the Index components, and the volatilities of their prices, to move in inconsistent directions at inconsistent rates.

In addition, market trends and changes to market structure may render the objective of the Index unachievable or to become impractical to replicate by investors.

Historical Index Levels published prior to the Index launch date are considered hypothetical. Historical Index Levels should not be considered as an indication of future performance.

The Bloomberg Multi-Tenor Indices are comprised of liquid commodity future contracts. If any commodity future contract is terminated or replaced in accordance with the rules of the Index methodology, a comparable commodity futures contract may be selected by BISL. The replacement of a commodity future contract may cause the level of the Bloomberg Multi-Tenor Index to change or be adjusted.

In the event the Bloomberg Multi-Tenor Indices level falls at or below zero due to an at any point intraday and/or end-of-day negative futures settlement price(s), the Index level will be closed at zero and terminated the same day, in which case the Index may cease to accurately measure its underlying market interest (see Handling of Negative and or Zero Pricing). Index users should therefore consider such possibility in connection with any financial instrument or financial contract based on the index to the extent the index level diverges from exposure to the underlying market.

BISL may discontinue or suspend calculation or publication of the Indices defined in this methodology. If this happens, BISL shall use reasonable efforts to provide advance notice through an Index announcement made available via [bloombergindices.com](http://bloombergindices.com) and on the Bloomberg Terminal via INP <GO>.

## Section 3: Index Calculation

The Bloomberg Multi-Tenor Indices aim to track the performance of an equal-weight basket containing 3 tenors of the futures curve beyond the nearby contract, representing Brent Crude Oil, Natural Gas and WTI Crude Oil. The Indices are calculated in USD and daily hedged versions in EUR and GBP.

### Index Rebalancing

The Indices are rebalanced each month on the rebalance date, and the weights are equally distributed amongst each tenor. The rebalance dates for each commodity index are defined in Table 1. Listed above in Table 3, are the list of the defined future tenors and the **Target Weights**. The Index Base Date CIM and the ongoing CIMs are used maintain continuity in the Index.

CIM's are calculated using the following formulas:

Base Date CIM Calculation

$$CIM = \frac{ITW_i * 100}{NCSP_t}$$

Where:

- $CIM$  is the Commodity Index Multiplier used to apply the Target Weight of the individual commodity futures contract, rounded to 8 decimal places.
- $ITW_i$  is the Target Weight of commodity futures contract  $i$  for each monthly **Rebalancing Day**.
- $NCSP_t$  is the **Next Contract Settlement Price** on Business Day  $t$ .

CIM Calculation

$$CIM = \frac{ITW_i * 100}{NCSP_t} * AF$$

Where:

- $CIM$  is the Commodity Index Multiplier used to apply the Target Weight of the individual commodity futures contract, rounded to 8 decimal places.
- $ITW_i$  is the Target Weight of commodity futures contract  $i$  for each monthly Rebalancing Day.
- $NCSP_t$  is the Next Contract Settlement Price on Business Day  $t$ .
- $AF$  is the Adjustment Factor.

$$AF = \frac{\sum_i CIM_r * NCSP}{100}$$

Where:

- $CIM_r$  is the previous Commodity Index Multiplier.

*NCSP* is the Roll In Settlement Price on Business Day  $t$

### Extraordinary Rebalance

BISL will conduct an index review if a futures contract (F1, F2, F3) trades or settles at or below \$10, and determine if immediate action is required. If a futures contract (F1, F2, or F3) trades or settles at or below zero, Bloomberg will conduct an extraordinary rebalance on the next Business Day. Index futures contracts and length of roll will be determined after a BISL review. All index determinations will be communicated through an index announcement.

### Index Rolling

The Indices hold long positions in commodity futures. To maintain long positions, contracts are 'rolled' from the expiring futures contract to a new contract farther down the futures curve with a longer expiry date. The calculation of the Multi-Tenor Index follow the roll schedule based on the commodity contract calendar listed in Table 4. The mapping for the contract letters and months is defined in Table 2.

**Table 4: Contract Month Codes**

<b>Contract Code</b>	<b>Month</b>
<b>F</b>	January
<b>G</b>	February
<b>H</b>	March
<b>J</b>	April
<b>K</b>	May
<b>M</b>	June
<b>N</b>	July
<b>Q</b>	August
<b>U</b>	September
<b>V</b>	October
<b>X</b>	November
<b>Z</b>	December

The Contract Calendar Table (Table 3) represents the **Lead Contract** on the first Business Day of each month.

**Table 5: Multi-Tenor Commodity Contract Calendar**

Commodity	Exchange	Bloomberg Code - Tenor	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Crude Oil (WTI)	CME	CL-F1	H	J	K	M	N	Q	U	V	X	Z	F	G
Crude Oil (WTI)	CME	CL-F2	J	K	M	N	Q	U	V	X	Z	F	G	H
Crude Oil (WTI)	CME	CL-F3	K	M	N	Q	U	V	X	Z	F	G	H	J
Brent Crude Oil	ICE-EU	CO-F1	J	K	M	N	Q	U	V	X	Z	F	G	H
Brent Crude Oil	ICE-EU	CO-F2	K	M	N	Q	U	V	X	Z	F	G	H	J
Brent Crude Oil	ICE-EU	CO-F3	M	N	Q	U	V	X	Z	F	G	H	J	K
Natural Gas	CME	NG-F1	H	J	K	M	N	Q	U	V	X	Z	F	G
Natural Gas	CME	NG-F2	J	K	M	N	Q	U	V	X	Z	F	G	H
Natural Gas	CME	NG-F3	K	M	N	Q	U	V	X	Z	F	G	H	J

**Prior to 2016**

Commodity	Exchange	Bloomberg Code -Tenor	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Brent Crude Oil	ICE-EU	CO-F1	H	J	K	M	N	Q	U	V	X	Z	F	G
Brent Crude Oil	ICE-EU	CO-F2	J	K	M	N	Q	U	V	X	Z	F	G	H
Brent Crude Oil	ICE-EU	CO-F3	K	M	N	Q	U	V	X	Z	F	G	H	J

Brent Crude Oil and the WTI Crude Oil index commodity futures will roll from the **Lead Contract** to the **Next Contract** over the sixth to tenth **Business Day** of each month, at 20% (1/5) each Business Day. Natural Gas commodity futures will roll from the Lead Contract to the Next Contract over the second to the eleventh Business Day of each month, at 10% (1/10) each Business Day. If a **Market Disruption Event (MDE)** occurs during the roll period, the roll weight will be “held”. The roll weight will catch up on the next Business Day when a MDE is not present. Table 6 is an example of the rolling process during the February Roll Period of 2014 for the WTI Crude Oil Index, while Table 7 depicts an example of the Natural Gas Roll.

**Table 6: Rolling Example for Crude Oil (CL)**

Date	Ticker	Day Count	Lead Contract	Next Contract	Yesterday Roll Weight		Today Roll Weight	
					% Lead	% Next	% Lead	% Next
2/7/2014	CL1	5	CLJ14	CLK14	100.00%	0.00%	80.00%	20.00%
2/7/2014	CL2	5	CLK14	CLM14	100.00%	0.00%	80.00%	20.00%
2/7/2014	CL3	5	CLM14	CLN14	100.00%	0.00%	80.00%	20.00%
2/10/2014	CL1	6	CLJ14	CLK14	80.00%	20.00%	60.00%	40.00%
2/10/2014	CL2	6	CLK14	CLM14	80.00%	20.00%	60.00%	40.00%
2/10/2014	CL3	6	CLM14	CLN14	80.00%	20.00%	60.00%	40.00%
2/11/2014	CL1	7	CLJ14	CLK14	60.00%	40.00%	40.00%	60.00%
2/11/2014	CL2	7	CLK14	CLM14	60.00%	40.00%	40.00%	60.00%
2/11/2014	CL3	7	CLM14	CLN14	60.00%	40.00%	40.00%	60.00%



2/12/2014	CL1	8	CLJ14	CLK14	40.00%	60.00%	20.00%	80.00%
2/12/2014	CL2	8	CLK14	CLM14	40.00%	60.00%	20.00%	80.00%
2/12/2014	CL3	8	CLM14	CLN14	40.00%	60.00%	20.00%	80.00%
2/13/2014	CL1	9	CLJ14	CLK14	20.00%	80.00%	0.00%	100.00%
2/13/2014	CL2	9	CLK14	CLM14	20.00%	80.00%	0.00%	100.00%
2/13/2014	CL3	9	CLM14	CLN14	20.00%	80.00%	0.00%	100.00%
2/14/2014	CL1	10	CLJ14	CLK14	0.00%	100.00%	0.00%	100.00%
2/14/2014	CL2	10	CLK14	CLM14	0.00%	100.00%	0.00%	100.00%
2/14/2014	CL3	10	CLM14	CLN14	0.00%	100.00%	0.00%	100.00%

**Table 7: Rolling Example for Natural Gas (NG)**

Date	Ticker	Day Count	Lead Contract	Next Contract	Yesterday Roll Weight		Today Roll Weight	
					% Lead	% Next	% Lead	% Next
2/1/2010	NG1	1	NGJ10	NGK10	100.00%	0.00%	90.00%	10.00%
2/1/2010	NG2	1	NGK10	NGM10	100.00%	0.00%	90.00%	10.00%
2/1/2010	NG3	1	NGM10	NGN10	100.00%	0.00%	90.00%	10.00%
2/2/2010	NG1	2	NGJ10	NGK10	90.00%	10.00%	80.00%	20.00%
2/2/2010	NG2	2	NGK10	NGM10	90.00%	10.00%	80.00%	20.00%
2/2/2010	NG3	2	NGM10	NGN10	90.00%	10.00%	80.00%	20.00%
2/4/2010	NG1	3	NGJ10	NGK10	80.00%	20.00%	70.00%	30.00%
2/4/2010	NG2	3	NGK10	NGM10	80.00%	20.00%	70.00%	30.00%
2/4/2010	NG3	3	NGM10	NGN10	80.00%	20.00%	70.00%	30.00%
2/5/2010	NG1	4	NGJ10	NGK10	70.00%	30.00%	60.00%	40.00%
2/5/2010	NG2	4	NGK10	NGM10	70.00%	30.00%	60.00%	40.00%
2/5/2010	NG3	4	NGM10	NGN10	70.00%	30.00%	60.00%	40.00%
2/8/2010	NG1	5	NGJ10	NGK10	60.00%	40.00%	50.00%	50.00%
2/8/2010	NG2	5	NGK10	NGM10	60.00%	40.00%	50.00%	50.00%
2/8/2010	NG3	5	NGM10	NGN10	60.00%	40.00%	50.00%	50.00%
2/9/2010	NG1	6	NGJ10	NGK10	50.00%	50.00%	40.00%	60.00%
2/9/2010	NG2	6	NGK10	NGM10	50.00%	50.00%	40.00%	60.00%
2/9/2010	NG3	6	NGM10	NGN10	50.00%	50.00%	40.00%	60.00%
2/10/2010	NG1	7	NGJ10	NGK10	40.00%	60.00%	30.00%	70.00%
2/10/2010	NG2	7	NGK10	NGM10	40.00%	60.00%	30.00%	70.00%
2/10/2010	NG3	7	NGM10	NGN10	40.00%	60.00%	30.00%	70.00%
2/11/2010	NG1	8	NGJ10	NGK10	30.00%	70.00%	20.00%	80.00%
2/11/2010	NG2	8	NGK10	NGM10	30.00%	70.00%	20.00%	80.00%
2/11/2010	NG3	8	NGM10	NGN10	30.00%	70.00%	20.00%	80.00%
2/12/2010	NG1	9	NGJ10	NGK10	20.00%	80.00%	10.00%	90.00%
2/12/2010	NG2	9	NGK10	NGM10	20.00%	80.00%	10.00%	90.00%
2/12/2010	NG3	9	NGM10	NGN10	20.00%	80.00%	10.00%	90.00%
2/16/2010	NG1	10	NGJ10	NGK10	10.00%	90.00%	0.00%	100.00%
2/16/2010	NG2	10	NGK10	NGM10	10.00%	90.00%	0.00%	100.00%
2/16/2010	NG3	10	NGM10	NGN10	10.00%	90.00%	0.00%	100.00%
2/17/2010	NG1	11	NGJ10	NGK10	0.00%	100.00%	0.00%	100.00%
2/17/2010	NG2	11	NGK10	NGM10	0.00%	100.00%	0.00%	100.00%
2/17/2010	NG3	11	NGM10	NGN10	0.00%	100.00%	0.00%	100.00%

## Index Calculation

Index Levels are determined on a day on which NYMEX is open for business. If a commodity futures contract **Settlement Price** is unavailable on a Business Day when NYMEX is open, the last available official Settlement Price will be used for the calculation of the Index. The official Index Level precision is four decimal places.

The Multi-Tenor (excess return) Index Level is calculated as follows:

$$IndexER = IndexER_{t-1} * (1 + DER)$$

Where:

<i>IndexER</i>	is the Multi-Tenor Index Level on Business Day t, rounded to 8 decimal places.
<i>IndexER<sub>t-1</sub></i>	is the Multi-Tenor Index Level on the Business Day immediately preceding Business Day t.
<b>DER</b>	is the <b>Daily Excess Return</b> of the commodity futures contracts

The Daily Excess Return is calculated as:

$$DER = \left( \frac{WAV}{PWAV} - 1 \right)$$

**Weighted Average Value ("WAV")** is calculated as:

$$WAV = \sum_i CIM1 * YLRW * \frac{LCSP_t}{L} + CIM2 * YNRW * \frac{NCSP_t}{L}$$

Where:

<i>CIM1</i>	is the <b>Lead CIM</b> .
<i>YLRW</i>	is the <b>Yesterday Lead Roll Weight</b> , i.e., the roll weight of commodity futures contract i on the Business Day immediately preceding Business Day t.
<i>LCSP<sub>t</sub></i>	is the <b>Lead Contract Settlement Price</b> .
<i>CIM2</i>	is the <b>Next CIM</b> .
<i>YNRW</i>	is the <b>Yesterday Next Roll Weight</b> , i.e., the roll weight of commodity futures contract i on the Business Day immediately preceding Business Day t.
<i>NCSP<sub>t</sub></i>	is the <b>Next Contract Settlement Price</b>
<i>L</i>	is the lot size (defined in Table 1)
<i>i</i>	is the commodity futures contract

Previous Weighted Average Value I (PWAV) is calculated as:

$$PWAV = \sum_i CIM1_{t-1} * YLRW * \frac{LCSP_{t-1}}{L} + CIM2_{t-1} * YNRW * \frac{NCSP_{t-1}}{L}$$

Where:

$CIM1_{t-1}$	is the Lead CIM
$YLRW$	is the <b>Yesterday Lead Roll Weight</b> , i.e., the roll weight of commodity futures contract i on the Business Day immediately preceding Business Day t.
$LCSP_{t-1}$	is the <b>Lead Contract Yesterday Settlement Price</b>
$CIM2_{t-1}$	is the Next CIM
$YNRW$	is the <b>Yesterday Next Roll Weight</b> , i.e., the roll weight of commodity futures contract i on the Business Day immediately preceding Business Day t.
$NCSP_{t-1}$	is the <b>Next Contract Yesterday Settlement Price</b>
$L$	is the lot size (defined in Table 1)

3 Month Multi-Tenor Total Return Index Level is calculated as follows:

$$MTTR_t = MTTR_{t-1} \times \left( \frac{IndexER}{IndexER_{t-1}} + IR_t \right)$$

Where:

$MTTR_t$	is the current Business Day Bloomberg Multi-Tenor TR Index Level, rounded to 8 decimal places.
$MTTR_{t-1}$	is the Business Day immediately preceding Business Day Bloomberg Multi-Tenor TR Index Level.
$IndexER$	is the IndexER Index Level on Business Day t.
$IndexER_{t-1}$	is the IndexER Index Level for Business Day immediately preceding Business Day t.
$TBD_t$	is the <b>Treasury Bill Daily Return</b> , calculated as

$$IR_t = \left[ \frac{1}{1 - \frac{91}{360} \times TBR_{t-1}} \right]^{\frac{D}{91}} - 1$$

Where:

$TBR_{t-1}$	is the 13-week (3 -month) US Treasury Bill ("T-Bill") Rate, the rate used is the most recent weekly auctioned high discount rate (ticker: USB3MTA Index).
$D=$	is the number of calendar days between Business Day (t), and the previous Business Day) (i.e. weekend=3)

4 Week Total Return Index Level is calculated as follows:

$$4WTR_t = 4WTR_{t-1} \times \left( \frac{IndexER}{IndexER_{t-1}} + IR4_t \right)$$

Where:

- $4WTR_t$  is the current Business Day Bloomberg 4 Week TR Index Level, rounded to 8 decimal places.
- $4WTR_{t-1}$  is the Business Day immediately preceding Business Day Bloomberg 4 Week TR Index Level.
- $IndexER$  is the ER Index Level on Business Day t.
- $IndexER_{t-1}$  is the ER Index Level for Business Day immediately preceding Business Day t.

Interest Return ( $IR4_t$ ) is calculated as follows:

$$IR4_t = \left[ \frac{1}{1 - \frac{28}{360} \times TBR_{t-1}} \right]^{\frac{D}{28}} - 1$$

Where:

- $TBR_{t-1}$  is the 4-week (1 -month) US Treasury Bill ("T-Bill") Rate, the rate used is the most recent weekly auctioned low discount rate (ticker: USB4WLYL Index).
- $D$  is the number of calendar days between Business Day (t), and the previous Business Day) (i.e., weekend=3)

The Multi-Tenor Daily Hedged (excess return) Index Level is calculated as follows:

$$HI_{ER,t} = HI_{ER,t-1} * \left( 1 + \frac{FX_{t-1}^A}{FX_t^A} * \left( \frac{I_{USD,ER,t}}{I_{USD,ER,t-1}} - 1 \right) \right)$$

Where:

- $HI_{ER,t}$  is the value of the Daily Hedged Excess Return Index on index business day t.
- $FX_t$  FX Spot price as obtained from the source and time summarized in the table below.
- $I_{USD,ER,t}$  is the value of the USD Excess Return Index on Business Day t.
- $A$  Quotation Exponent as defined in the table below:

Currency	A	FX Fixing Source	FX Fixing Time
EUR	1	Bloomberg BFIX	16:00 London
GBP	1	Bloomberg BFIX	16:00 London

The Multi-Tenor Daily Hedged (total return) Index Level is calculated as follows:

$$HI_{TR,t} = HI_{TR,t-1} * \left( \frac{HI_{ER,t}}{HI_{ER,t-1}} + IRR_t \right)$$

Where:

$HI_{TR,t}$  is the value of the Daily Hedged Total Return Index on Business Day t.  
 $HI_{ER,t}$  is the value of the Daily Hedged Excess Return Index on Business Day t.  
 $IRR_t$  is the Interest Rate Return index business day t, generally defined as:

$$IRR_t = \left( 1 - \frac{N * (ARR_t - Spread)}{D} \right)^{\frac{d_{t-1} - d_t}{N}} - 1$$

Where:

$ARR_t$  is the Applicable Reference Rate on Business Day t defined as the latest reference rate published as of a previous day prior to such Business Day t.  
 $N$  is the currency market convention Numerator as defined in the table below.  
 $D$  is the currency market convention Denominator as defined in the table below;

Currency	N	D	Reference Rate	Spread	Ticker
EUR	1	360	euro short-term rate €STR + 8.5 bps	0	ESTRON Index
GBP	1	365	SONIA O/N Deposit rate	0	SONIO/N Index

Effective October 29, 2020, the EONIA was replaced with the euro short-term rate €STR + 8.5 bps.

Both excess and total return index levels are rounded to 8 decimal places.

### Handling of Negative and or Zero Pricing

In the event a Bloomberg Multi-Tenor Index level falls at or below zero due to an intraday and/or futures settlement price(s), the Index level will be closed at zero and terminated same day. Intraday index levels are calculated and monitored 05:00 - 15:15 EST. If the intraday Index level is calculated incorrectly using an incorrect exchange price or as a result of a technical issue, the Index will not be terminated and will continue.

## Section 4: Market Disruption Events

Market Disruption Events (MDE) can occur to commodity futures for several reasons:

- a) The termination or suspension of, or material limitation or disruption in, the trading of any future contract used in the calculation of the Index on that day;
- b) The settlement price of any such contract reflect the maximum permitted price change from the previous day's settlement price, based on limits set by commodity exchanges
- c) The failure of an exchange to publish settlement prices.

If a MDE occurs with respect to the Bloomberg Multi-Tenor Index during the "Roll Period" for either the lead or next contract, the daily roll of the relevant futures contract will be held for that Business Day. On the following Business Day on which a Market Disruption Event does not occur, the roll weight will account for the current days roll weight and the previous Business Day (MDE's) roll weight.

If a MDE persists for four consecutive Index Business Days immediately following the original Index Business Day on which a MDE occurs, then the Index Administrator shall determine what further actions it may reasonably take.

If, on any Index Business Day, a MDE occurs or is occurring that the Index Administrator determines, in its sole discretion, materially affects the Index, the Index Administrator may defer or suspend the calculation and publication of the Index Value and any other information relating to the Index until the next Index Business Day on which such disruption event is not continuing.

## Section 5: Benchmark Governance and Review

### Data Providers and Data Extrapolation

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

### Benchmark Governance, Audit and Review Structure

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

### Index and Data Reviews

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

### Exchange Settlement Price Delays

In the event an exchange delays the pricing of future settlements pertaining to the Bloomberg Multi-Tenor Indices, BISL will delay the publication of Index Levels to vendors and delivery of index data files.

### Error Corrections/Restatement Policy

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

### Exchange Settlement Price Amendments

On the occasion when an exchange amends the Settlement Price of a contract used in the Bloomberg Multi-Tenor Indices prior to 7 PM EST, BISL will send an index announcement following the discovery to inform all clients of the correction. BISL will then recalculate, republish, and redistribute end-of day files.

### Expert Judgment

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

### Reinvestment of Dividends and Coupons

Dividends and coupon payments play no direct role in this Index Methodology Handbook, and are therefore not accounted for by the Index.

### Real-time Distribution

Real-time index levels are considered indicative only. BISL strives to provide accurate real-time calculation of its indices, however the following circumstances may occur during real-time dissemination hours.

- Incorrect index levels can be disseminated.
- Indices may stop disseminating.
- Indices may disseminate stale prices.

## Section 6: Index Terms

**"Base Index Level"** means the starting Index Level of 100 for each of the Indices.

**"BCLMTER Index"** means the Bloomberg WTI Crude Oil Multi-Tenor Excess Return Index.

**"BCLMTTR Index"** means the Bloomberg WTI Crude Oil Multi-Tenor Total Return Index.

**"BCOMTER Index"** means the Bloomberg WTI Brent Crude Oil Multi-Tenor Excess Return Index.

**"BCOMTTR Index"** means the Bloomberg Brent Crude Oil Multi-Tenor Total Return Index.

**"BNGMTER Index"** means the Bloomberg Natural Gas Multi-Tenor Excess Return Index.

**"BNGMTTR Index"** means the Bloomberg Natural Gas Multi-Tenor Total Return Index.

**"BISL"** means Bloomberg Index Services Limited.

**"BOC"** means the Benchmark Oversight Committee.

**"Business Day"** means any day on which NYMEX is open for business.

**"Commodity Index Multiplier (CIM)"** means the derived multiplier calculated to apply the Target Weights of each individual commodity futures contract to the Index as set out in Section 3.

**"Index Administrator"** means BISL.

**"Index Base Date"** means the first date of the Index history as described in Section 1.

**"Index Commencement Date"** means the date each of the Indices is first made available on the relevant Bloomberg Page, i.e., June 4<sup>th</sup>, 2020.

**"Index Level"** means, in respect of the Index and a Business Day, the value of the Index on such Business Day, calculated in accordance with the methodology described in Section 3.

**"Index Owner"** means BISL.

**"PROC"** means the Product, Risk and Oversight Committee.

**"Lead CIM"** means the lead contract's Commodity Index Multiplier as defined in Section 3.

**"Lead Contract"** means the rolling out commodity futures contract as defined in Table 5.

**"Market Disruption Event (MDE)"** has the meaning given to such term in Section 4.

**"Next CIM"** means the next contract's Commodity Index Multiplier as defined in Section 3.



**“Next Contract”** means the rolling in commodity futures contract as defined in Table 5.

**“Next Contract Settlement Price”** means the official settlement prices provided by the exchange of the rolling in commodity futures contract defined in Table 5.

**“Rebalancing Day”** month when the Index resets to its equal Target Weights, define in Table 1.

**“Rolling”** means the commodity futures contracts are ‘rolled’ during the Roll Period from the expiring futures contract (Lead Contract) to a new contract farther down the futures curve with a longer expiry date (Next Contract). After the Roll Period, the former Next Contract becomes the new Lead Contract.

**“Roll Period”** means in respect of the Indices and the Lead Contract, define in Table 1.

**“Settlement Price”** means the official settlement prices provided by an exchange.

**“Target Weights”** means the weighting of each commodity futures contract (1/3), as defined in Table 3.

**“Treasury Bill Daily Return”** means the return of cash collateral invested in the 3-Month T-Bill, or the U.S. Treasury 4-Week Bill Low Discount Rate.

## Version Tracker

Date	Update
6/7/2024	Updated to include the calculation of the 4 Week Total Return Indices.

## Accessing Index Data

Bloomberg Terminal®	Bloomberg indices are the benchmarks of choice for capital markets investors. The Bloomberg Index Browser IN <GO> displays the latest performance results and statistics for the indices as well as history. IN presents the indices that make up Bloomberg's global, cross-asset Index families into a hierarchical view, facilitating navigation and comparisons. The "My Indices" tab allows a user to focus on a set of favorite indices. Bloomberg's Portfolio & Risk Analytics solution (PORT <GO>) includes tools to analyze the risk, return, and current structure of indices. PORT includes tools to analyze performance of a portfolio versus a benchmark as well as models for performance attribution, tracking error analysis, value-at-risk, scenario analysis, and optimization.
Bloomberg Website	The index <a href="#">website</a> makes available limited Index information including: <ul style="list-style-type: none"> <li>• Index methodology and factsheets</li> <li>• Current performance numbers for select indices</li> </ul>
Index Licensing	Bloomberg requires a license for use of indices in conjunction with: <ul style="list-style-type: none"> <li>• Exchange-traded index products</li> <li>• OTC products</li> <li>• Index or constituent-level redistribution</li> <li>• Custom index solutions</li> <li>• Use of any index data outside of the Bloomberg Terminal®</li> </ul>
Index Tickers	<p>BCLMTER: Bloomberg WTI Crude Oil Multi-Tenor Excess Return Index</p> <p>BCLMTTR: Bloomberg WTI Crude Oil Multi-Tenor Total Return Index</p> <p>BCOMTER: Bloomberg Brent Crude Oil Multi-Tenor Excess Return Index</p> <p>BCOMTTR: Bloomberg Brent Crude Oil Multi-Tenor Total Return Index</p> <p>BNGMTER: Bloomberg Natural Gas Multi-Tenor Excess Return Index</p> <p>BNGMTTR: Bloomberg Natural Gas Multi-Tenor Total Return Index</p>

## Take the next step.

For additional information, press the <HELP> key twice on the Bloomberg Terminal.

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