Bloomberg Electrification Metals Index Methodology

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Section 1: Index Overview

The Bloomberg Electrification Metals Index aims to track the performance of holding a long position of electrification metal commodity futures contracts. The Bloomberg Electrification Index tracks the return of a basket of 6 key electrification metals Aluminum, Copper, Nickel, Zinc, Cobalt, and Lithium. The index rebalances on the close of the 4th index business day each quarter, January, April, July, October, resetting each commodity to their target weight (as described in Section 2). The Total Return versions are calculated using the returns of the underlying excess return index and the return of cash collateral invested in the 3-Month T-Bill.

Table 1: Bloomberg Electrification Index

Index Names	Ticker	Currency	Index Commencement Date
Bloomberg Electrification Metals ER Index	BELEC	USD	9/7/2022
Bloomberg Electrification Metals TR Index	BELECTR	USD	9/7/2022

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 commodity futures positions will be rolled on the fifth through the ninth **Index business day** of each calendar month, with corresponding ER weights being adjusted in the calculation of the index from the sixth through the tenth **Index business day**. **Index Levels** are calculated on the days BCOM is.

The Bloomberg Electrification Index is denominated in U.S. dollars. The Electrification Index all have a **Base Date** of June 4th, 2021 with a **Base Index Level** of 100.

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.

In particular, the Bloomberg Electrification Index aims to track the performance of holding a long position of electrification metal commodity futures contracts. The Index are therefore subject to subject to risk of holding a commodity futures contract which may fluctuate rapidly and may be subject to temporary distortions or other market disruptions 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 programmes, domestic and foreign political and economic events and policies, disease, pestilence, technological developments, changes in interest rates, whether through governmental action or market movements, and monetary and other governmental policies, action and inaction.

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 Electrification Index is 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 Index to change or be adjusted.

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 and on the Bloomberg Terminal via INP <GO>.

Section 3: Index Calculation

The Bloomberg Electrification Index aims to track the performance of holding a long position of a basket of commodities reflective of the electrification theme. The index rebalances on the close of the 4th index business day quarterly, in January, April, July and October, resetting each commodity to their target weight. Target weights will be rounded to 8 decimal places. The composition and weights are determined by BISL in consultation with BNEF, based on projected supply and demand, and liquidity (traded volume) of each commodity. The composition and weights will be reviewed on an annual basis. The annual composition and target weights will be implemented each January. If BISL is unable to determine the weights in consultation with BNEF for the upcoming annual rebalance, BISL will use the previous year index target weights.

2024 Target Weights

Commodity	Ticker	Target Weight
Copper	HG	30%
Aluminum	LA	20%
Nickel	LN	20%
Zinc	LX	15%
Cobalt	BYW	10%
Lithium	LFA	5%

Index Rebalancing

The Indices are rebalanced quarterly after the close of business on the fourth index business day in each month. The annual target weights are applied to the index by calculating index units call Commodity Index Multipliers (CIMs). 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:

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

Where:

CIM is the Commodity Index Multiplier used to apply the Target Weight of the individual commodity futures contract, rounded to 8 decimal places.

$PMTW_i$ is the Electrification Annual Target Weight of commodity futures contract i.

$NCSP_t$ is the **Next Contract Settlement Price** on Index business day t, using price conversion.

Quarterly CIM Calculation

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

Where:

CIM is the Commodity Index Multiplier used to apply the Target Weight of the individual commodity futures contract, rounded to 8 decimal places.

$PMTW_i$ is the Electrification Target Weight of commodity futures contract i for each Rebalancing Day.

$NCSP_t$ is the Next Contract Settlement Price on Index 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 Next Contract Settlement Price on Index business day t.

Index Rolling

The Index hold a long positions in commodity futures. To maintain a long position, 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 Electrification Index follows the roll schedule based on the commodity contract calendar listed in Table 3. The mapping for the contract letters and months are defined in Table 2.

Table 2: Contract Month Codes

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

The Contract Calendar Table (Table 3) represents the **Lead Contract** on the first Index business day of each month.

Table 3: Contract Calendar

Commodity	Exchange	Bloomberg Code	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Aluminum	LME	LA	H	H	K	K	N	N	U	U	X	X	F	F*
Copper	CME	HG	H	H	K	K	N	N	U	U	Z	Z	Z	H*
Nickel	LME	LN	H	H	K	K	N	N	U	U	X	X	F	F*
Zinc	LME	LX	H	H	K	K	N	N	U	U	X	X	F	F*
Cobalt	LME	CVT	H	H	K	K	N	N	U	U	X	X	F	F*
Lithium	CME	LFA	H	H	K	K	N	N	U	U	X	X	F	F*

The Indices will roll from the Lead Contract to the Next Contract from the sixth to tenth Index business day of each month at 20% (1/5) each Index business day. If a Market Disruption Event ("MDE") occurs during the roll period (Index business days 5 through 9), the roll weight will be "held". The roll weight will catch up on the next Index business day when a MDE is not present. Table 3 is an example of the rolling process during the March Roll Period of 2010.

Index Calculation

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

The ER Index Level is calculated as follows:

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

Where:

$IndexER_t$	is the ER Index Level on Index business day t, rounded to 8 decimal places.
$IndexER_{t-1}$	is the ER Index Level on the Index business day immediately preceding Index business day t.
DER	is the Daily ER of the commodity futures contracts.

The Daily ER is calculated as:

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

Total Return Index Level (leveraged, and inverse indices) is calculated as follows:

$$IndexTR_t = IndexTR_{t-1} \times \left(\frac{IndexER_t}{IndexER_{t-1}} + IR_t\right)$$

Where:

$IndexTR_t$	is the Total Return Index Level on Index business day t, rounded to 8 decimal places.
$IndexTR_{t-1}$	is the Total Return Index Level on the Index business day immediately preceding Index business day t.
$IndexER_t$	is the ER Index Level on Index business day t.
$IndexER_{t-1}$	is the ER Index Level on the Index business day immediately preceding Index business day t.

IR_t is the Treasury Bill Daily Return, 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 Index business day t, and the previous Index business day (i.e. 3 for weekend)

Weighted Average Value ("WAV") on Index business day t is calculated as:

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

Where:

$CIM1$ is the Commodity Index Multiplier for Lead Contract.

$YLRW$ is the Yesterday Lead Roll Weight, i.e., the roll weight of commodity futures contract i on the Index business day immediately preceding Index business day t.

$LCSP_t$ is the Lead Contract settlement price on Index business day t.

$CIM2$ is the Commodity Index Multiplier for Next Contract.

$YNRW$ is the Yesterday Next Roll Weight, i.e., the roll weight of commodity futures contract i on the Index business day immediately preceding Index business day t.

$NCSP_t$ is the Next Contract settlement price on Index business day t.

L is the lot size of the futures contract.

i designates each individual commodity

Previous Weighted Average Value ("$PWAV$") on Index business day t 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 Commodity Index Multiplier for Lead Contract on the Index business day immediately preceding Index business day t.
$YLRW$	is the Yesterday Lead Roll Weight, i.e., the roll weight of commodity futures contract i on the Index business day immediately preceding Index business day t.
$LCSP_{t-1}$	is the Lead Contract settlement price on the Index business day immediately preceding Index business day t using price conversion.
$CIM2_{t-1}$	is the Commodity Index Multiplier for Lead Contract on the Index business day immediately preceding Index business day t.
$YNRW$	is the Yesterday Next Roll Weight, i.e., the roll weight of commodity futures contract i on the Index business day immediately preceding Index business day t.
$NCSP_{t-1}$	is the Next Contract settlement price on the Index business day immediately preceding Index business day t.
L	is the lot size.
i	designates each individual commodity

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 Electrification Index family during the "Roll Period" for either the lead or next contract, the daily roll of the relevant futures contract will be held for that Index business day. On the following Index 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 Index 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

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.

Conflicts of interest

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 Electrification Index 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 Electrification Index 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.

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.

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.

Section 6: Index Terms

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

"BISL" means Bloomberg Index Services Limited.

"BOC" means the Benchmark Oversight Committee.

"Index business day" means any day on which BCOM is open for business.

"**Commodity Index Multiplier (CIM)"** means the value of one as described 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., April 15th, 2022.

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

"PROC" means the Product, Risk and Operations Committee.

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

"Lead Contract Settlement Price" means the official settlement prices provided by the exchange of the rolling out commodity futures contract defined in Table 5.

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

"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 as defined in Table 5.

"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 the sixth to tenth Index business day of each month, at 20% (1/5) each Index business day for the Excess Return Calculation.

"Settlement Price" means the official settlement prices provided by an exchange.

"Treasury Bill Daily Return" means the return of cash collateral invested in the 3-Month T-Bill.

Annex 1

TEMPLATE FOR EXPLAINING HOW THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY REFLECT ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) FACTORS

EXPLANATION OF HOW ESG FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY	
Item 1. Name of the benchmark administrator.	Bloomberg Index Services Limited
Item 2. Type of benchmark or family of benchmarks.	Other
Item 3. Name of the benchmark or family of benchmarks.	Electrification Metals Index
Item 4. Does the benchmark methodology for the benchmark or family of benchmarks take into account ESG factors?	No
Item 5. Where the response to Item 4 is positive, please list below, for each family of benchmarks, those ESG factors that are taken into account in the benchmark methodology, taking into account the ESG factors listed in Annex II to Delegated Regulation (EU) 2020/1816. Please explain how those ESG factors are used for the selection, weighting or exclusion of underlying assets. The ESG factors shall be disclosed at an aggregated weighted average value at the level of the family of benchmarks.	
(a) List of environmental factors considered:	Selection, weighting or exclusion:
(b) List of social factors considered:	Selection, weighting or exclusion:
(c) List of governance factors considered:	Selection, weighting or exclusion:
Item 6. Where the response to Item 4 is positive, please list below, for each benchmark, those ESG factors that are taken into account in the benchmark methodology, taking into account the ESG factors listed in Annex II to Delegated Regulation (EU) 2020/1816, depending on the relevant underlying asset concerned. Please explain how those ESG factors are used for the selection, weighting or exclusion of underlying assets. 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. Alternatively, all of this information may be provided in the form of a hyperlink to a website of the benchmark administrator included in this explanation. The information on the website shall be easily available and accessible. Benchmark administrators shall ensure that information published on their website remains available for five years.	
(a) List of environmental factors considered:	Selection, weighting or exclusion:
(b) List of social factors considered:	Selection, weighting or exclusion:
(c) List of governance factors considered:	Selection, weighting or exclusion:
Hyperlink to the information on ESG factors for each benchmark:	
Item 7. Data and standards used	
(a) Data input.	N/A

(i) *Describe whether the data are reported, modelled or sourced internally or externally.* (ii) *Where the data are reported, modelled or sourced externally, please name the third party data provider.*	
(b) Verification and quality of data. *Describe how data are verified and how the quality of those data is ensured.*	N/A
(c) Reference standards *Describe the international standards used in the benchmark methodology.*	N/A
Date on which information has been last updated and reason for the update:	7th September 2022, initial publication

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