

# Index Methodology

Bloomberg Commodity Carbon Tilted Indices

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# The Bloomberg Commodity Carbon Tilted Index

## CHAPTER 1. OVERVIEW OF THE INDEX

### SECTION 1.1 INTRODUCTION

The Bloomberg Commodity Carbon Tilted Index (“BCOMCA” or the “Index”) is designed to be a liquid, diversified benchmark based on US dollar denominated commodity futures. The Index is a variant of the Bloomberg Commodity Index<sup>1</sup> (“BCOM”) and seeks to incorporate a measure of the environmental costs associated with the production of the underlying commodities referenced by each futures contract.

Greenhouse gas emissions comprise of different gaseous compounds that contribute to global warming<sup>2</sup>. The GHG emissions associated with the production processes for each commodity are typically listed individually, with a conversion factor used to combine them into a single value called the carbon dioxide equivalent (CO<sub>2</sub>e). The index uses a CO<sub>2</sub> equivalent measure for each of the Greenhouse gases. From this viewpoint, since the reference value is in terms of a carbon compound, the GHG emissions can be viewed as representative of the carbon factor.

In BCOMCA, the annually determined BCOM Commodity Index Percentages (“CIPs”) are tilted to account for the Greenhouse Gas emissions associated with the production of that commodity (“GHG Emissions”) which are assessed on a per unit of production basis. The GHG Emissions are estimated using Life Cycle Assessment (“LCA”) models, which measure emissions at each stage of the production process for the physical assets underlying the set of commodities the Index is providing financial exposure to.

The Index aims to tilt the target Commodity Index Percentages within each Commodity Group, while maintaining the percentage allocations to each group as per the BCOM Index.

This Methodology describes the calculation of the Index by adding specific sections to the existing BCOM Index Methodology to detail the process through which the Commodity Index Percentages (CIPs) are tilted to account for the GHG Emissions.

This Methodology refers to the existing BCOM Index Methodology in relation to CHAPTER 2 (“INDEX CONSTRUCTION”) and CHAPTER 3 (“CALCULATION OF THE INDICES”), including all relevant APPENDICES. Such chapters include the sections detailing the following calculations:

- Annual determination of the CIPs (“CALCULATION OF COMMODITY LIQUIDITY PERCENTAGES”, “CALCULATION OF COMMODITY PRODUCTION PERCENTAGES”, “CALCULATION OF THE COMMODITY INDEX PERCENTAGES”)
- Annual determination of the CIMs (“CALCULATION OF THE COMMODITY INDEX MULTIPLIERS”)

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<sup>1</sup> The Index is based on the latest documentation available: [Link](#)

<sup>2</sup> IPCC (2007). IPCC Fourth Assessment Report: Climate Change 2007. Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge.

- Ongoing Index Calculation (“ONGOING CALCULATION OF WAV1 AND WAV2”, “CALCULATION OF THE BLOOMBERG COMMODITY INDEX”)

The additional sections specific to BCOMCA are:

- SECTION 2.7, describes the BCOM Index CIPs tilting process using the GHG Emissions
- SECTION 2.8. defining the BCOMCA parameters

The diagram below compares the Methodology Calculation Flow of the BCOM index with the corresponding one of the BCOMCA index; except for the specific tilting, based on the GHG Emission estimates, the index construction and calculation is following the same BCOM logic and rules.

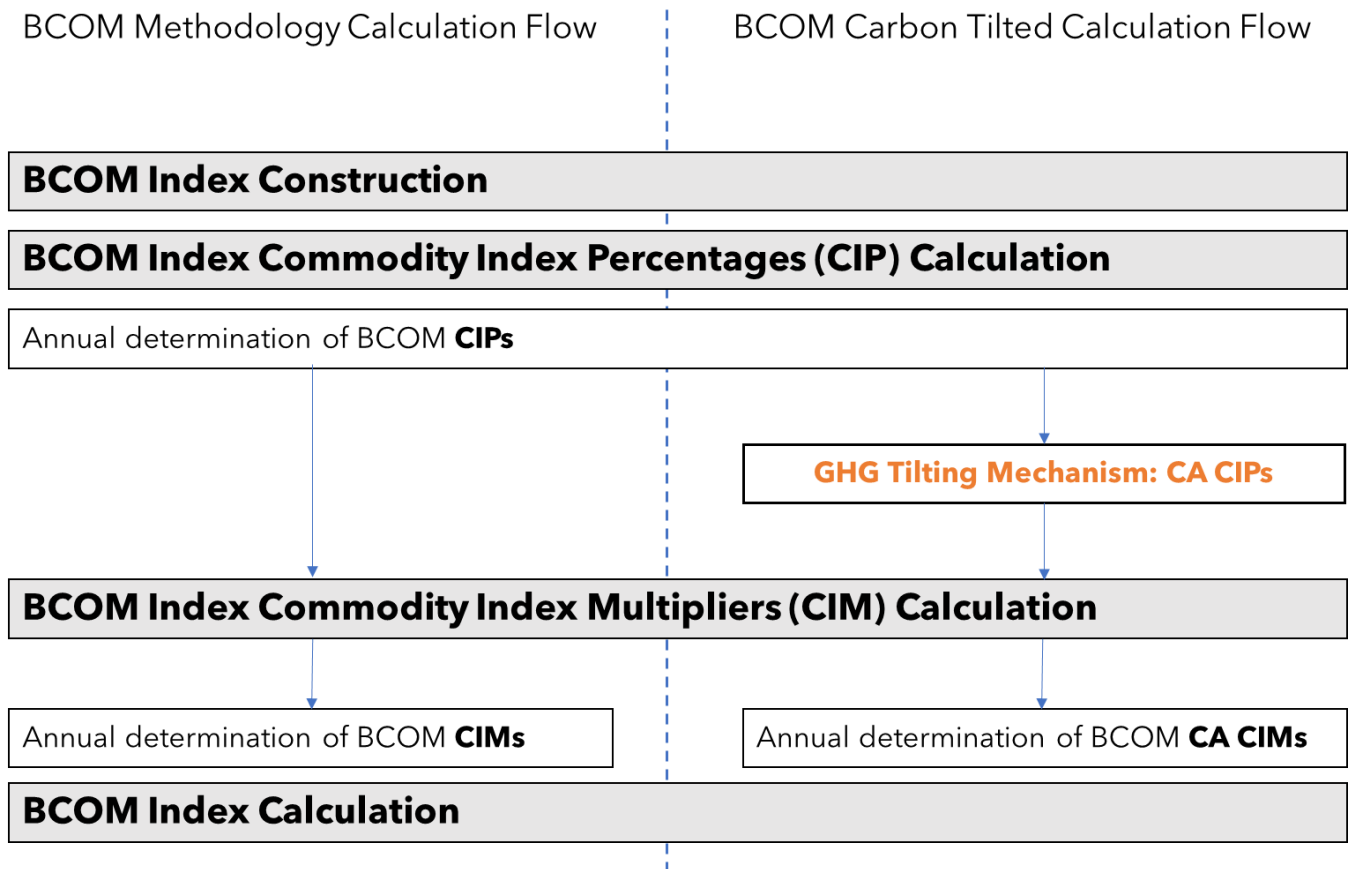


Figure 1 - Methodology Calculation Flow Diagram

## **SECTION 1.2 CONSTRUCTION PRINCIPLES**

This section references the corresponding one in the BCOM Index Methodology.

## **SECTION 1.3 GOVERNANCE**

### **Benchmark Governance, Audit and Review Structure**

BISL uses three primary committees to provide overall governance and effective oversight of its benchmark administration activities:

- The Product, Risk & Operations Committee (“**PROC**”) is responsible for the first line of control over the creation, design, production and dissemination of benchmark indices, strategy indices and fixings administered by the BISL.
- The oversight function is provided by Bloomberg’s Benchmark Oversight Committee (“**BOC**”). The BOC is independent of the PROC and is responsible for the review and challenge of the Board and the PROC regarding relevant aspects of the provision of Benchmarks by BISL, as set out in the UK BMR.
- The Risk Committee (“**RiskCo**”) advises the Board, the PROC and the BOC on the Company’s overall risk appetite, tolerance and strategy and oversees the Company’s risk exposure and risk strategy.

On a quarterly basis, the PROC reports to the BOC on governance matters, including but not limited to client complaints, the launch of new benchmarks, operational incidents (including errors & restatements), major announcements and material changes concerning the benchmarks, the results of any reviews of the benchmarks (internal or external) and material stakeholder engagements.

### **Internal and External Reviews**

BISL’s Index administration is also subject to Bloomberg’s Compliance function which periodically reviews various aspects of its businesses in order to determine whether it is adhering to applicable policies and procedures, assessing whether applicable controls are functioning properly. In addition, Bloomberg may from time to time appoint an independent external auditor with appropriate experience and capability to review adherence to benchmark regulation. The frequency of such external reviews will depend on the size and complexity of the operations and the breadth and depth of the Index use by stakeholders.

### **Index and Data Reviews**

BISL will review the Index (both the rules of construction and data inputs) on a periodic basis, not less frequently than annually, to determine whether they continue to reasonably measure the intended underlying market interest, the economic reality or otherwise align with their stated objective. More frequent reviews may result from extreme market events and/or material changes to the applicable underlying market interests.

In addition to material changes, BISL may from time to time terminate the Index (“Discontinued Index”), whether due to changes in market structure, a lack of requisite data, insufficient usage, or for other regulatory or practical concerns. The process for terminating a Discontinued Index is as follows:

The PROC will review proposed terminations, taking into account the reasons for termination, the impact on users (if any), the availability of alternative products and other such factors. If termination is approved, users will be provided as much prior notice as is reasonable under the circumstances, typically 90 days. In the event there is little or no known usage identified, the Discontinued Indices may be terminated with less (or no) notice, as applicable. In the event the Discontinued Indices are licensed for use as the basis of an ETF or other widely-available financial product or is otherwise determined by BISL to be an important benchmark without reasonable substitutes, the notice period may be extended, as warranted. Any advance notice period is subject to BISL being reasonably able to continue administering and calculating such benchmark during such period (for example, BISL has access to requisite data on commercially reasonable terms, is not subject to any litigation or other claims, has adequate internal resources and capabilities, etc.). Terminations and associated user engagement decisions made by the PROC are subject to review by BISL's oversight function, the BOC.

Criteria for data inputs include reliable delivery and active underlying markets. Whether an applicable market is active depends on whether there are sufficient numbers of transactions (or other indications of price, such as indicative quotes) in the applicable constituents (or similar underlying constituent elements) that a price (or other value, as applicable) may be supplied for such constituent(s).

Other than as set forth in this Methodology, there are no minimum liquidity requirements for Index constituents and/or minimum requirements or standards for the quantity or quality of the input data

Any resulting change to the Methodology deemed to be material (discussed below) will be subject to the review of the PROC under the oversight of the BOC, each of which committees shall be provided all relevant information and materials it requests relating to the change. Details regarding the PROC and BOC are described above. Material changes will be reflected and tracked in updated versions of this Methodology. Material changes related to the Indices will be made available in advance to affected stakeholders whose input will be solicited. The stakeholder engagement will set forth the rationale for any proposed changes as well as the timeframe and process for responses. The Index Administrator will endeavour to provide at least two weeks for review prior to any material change going into effect. In the event of exigent market circumstances, this period may be shorter. Subject to requests for confidentiality, stakeholder feedback and the Index Administrator’s responses will be made accessible upon request.

In determining whether a change to an Index is material, the following factors shall be taken into account:

- The economic and financial impact of the change;
- Whether the change affects the original purpose of the Index; and/or
- Whether the change is consistent with the overall objective of the Index and the underlying market interest it seeks to measure.



## **Expert Judgement**

The Indices are rules-based, and their construction is designed to consistently produce values without the exercise of expert judgment or discretion. Nevertheless, BISL may use expert judgment or discretion with regards to the following:

- Index restatements
- Extraordinary circumstances during a market emergency
- Data interruptions, issues, and closures

When expert judgment or discretion is required, BISL undertakes to be consistent in its application, with recourse to written procedures outlined in the methodology of the Indices and internal procedures manuals. In certain circumstances exercises of expert judgment or discretion are reviewed by senior members of BISL management and Bloomberg Compliance teams, and are reported to the Product, Risk & Operations Committee (PROC), BISL's governance committee, which operates under the supervision of BISL's oversight function, the Benchmark Oversight Committee (BOC). BISL also maintains and enforces a code of ethics to prevent conflicts of interest from inappropriately influencing index construction, production, and distribution, including the use of expert judgment or discretion.

## **Restatement Policy**

BISL strives to provide accurate calculation of its indices. However, to the extent a material error in index levels is uncovered following publication and dissemination, a public notification will be made alerting of such error and the expected date of a revised publication, if warranted.

BISL considers the following factors to determine whether to restate. Not all conditions need to be present to warrant a restatement, and certain factors may be more determinative than others depending on the circumstances of the given error.

- The relative importance of the data field impacted by the error;
- When the error occurred and when it was discovered;
- The number of indices and sub-indices affected;
- Whether the impacted indices are linked to tradable products;
- The magnitude of the error;
- The burden of restatement on client re-processing relative to the impact of the error;
- The impact of the restatement on analytical tools.

## **Conflicts of Interest**

The Index confers on BISL discretion in making certain determinations, calculations and corrections from time to time. In making those determinations, calculations and corrections, BISL has no obligation to take the needs of any Product Investor or any other party into consideration.

BISL is committed to avoiding and, where necessary, managing actual or potential conflicts of interest in the

BISL decision-making process and has established a Conflicts of Interest Policy to minimize or resolve actual or potential conflicts of interest.

BISL does not create, trade or market Index Products.

## **SECTION 1.4 INDEX LIMITATIONS AND RISKS**

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 market interests which the Indices intend to measure or upon which the Indices are dependent in order to achieve their stated objective. For example, illiquidity can have an impact on the quality or amount of data available to the Index Administrator for calculation and may cause the Indices to produce unpredictable or unanticipated results.

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.

The following is a summary of certain risks associated with BCOMCA but is not meant to be an exhaustive list of all risks associated with the Index or an investment in commodities, commodity futures or commodity-linked or commodity index-linked products generally.

### **Commodity Prices May Change Unpredictably, Affecting the Value of the Index in Unforeseeable Ways**

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 Index, related indices and Subindices 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.

### **Suspension or Disruptions of Market Trading in Commodities and Related Futures May Adversely Affect the Value of the Index**

The futures markets occasionally experience disruptions in trading (including temporary distortions or other

disruptions due to various factors such as the lack of liquidity in markets, the participation of speculators and government regulation and intervention) referred to in this Methodology as “Market Disruption Events.” Market Disruption Events include the cessation, for a material time, of trading in futures contracts included in the Index or the imposition by the futures exchange on which one or more such futures contracts are traded of a “limit price,” a range outside of which such futures contracts are not permitted to trade. In addition, a futures exchange may replace or delist a futures contract included in the Index.

Procedures have been established to address such events; such procedures are set forth in this Methodology. There can be no assurance, however, that a Market Disruption Event, the replacement or delisting of a commodity contract or any other force majeure event will not have an adverse or distortive effect on the value of the Index or the manner in which it is calculated.

### **Future Prices of the Index Components That Are Different Relative to Their Current Prices May Affect the Value of the Index**

The Index is composed of commodity futures contracts rather than physical commodities. Unlike equities, which typically entitle the holder to a continuing stake in a corporation, commodity futures contracts normally specify a certain date for delivery of the underlying physical commodity. As the exchange-traded futures contracts that compose the Index approach expiration, they are replaced by similar contracts that have a later expiration. Thus, for example, a futures contract purchased and held in August may specify an October expiration date. As time passes, the contract expiring in October may be replaced by a contract for delivery in December. This process is referred to as “rolling.”

If the market for these contracts is in “backwardation,” which means that the prices are lower in the distant delivery months than in the nearer delivery months, the purchase of the December contract would take place at a price that is lower than the sale price of the October contract. Conversely, if the market for these contracts is in “contango,” which means that the prices are higher in the distant delivery months than in the nearer delivery months, the purchase of the December contract would take place at a price that is higher than the sale price of the October contract. The difference between the prices of the two contracts when they are rolled is sometimes referred to as a “roll yield,” and the change in price that contracts experience while they are components of the Index is sometimes referred to as a “spot return.” An investor in the Index cannot receive either the roll yield or the spot return separately.

The presence of contango in the commodity markets could result in negative roll yields, which could adversely affect the value of the Index. Because of the potential effects of negative roll yields, it is possible for the value of the Index to decrease significantly over time, even when the near-term or spot prices of underlying commodities are stable or increasing. It is also possible, when near-term or spot prices of the underlying commodities are decreasing, for the value of the Index to decrease significantly over time even when some or all of the constituent commodities are experiencing backwardation.

Certain commodities included in the Index, such as gold, have historically traded in contango markets and the Index has experienced periods in which many of the commodities in the Index are in contango. Although certain of the contracts included in the Index have historically experienced periods of

backwardation, it is possible that such backwardation will not be experienced in the future.

### **The Index May in the Future Include Contracts That Are Not Traded on Regulated Futures Exchanges**

The Index was originally based solely on futures contracts traded on regulated futures exchanges (referred to in the United States as “designated contract markets”). At present, the Index is comprised exclusively of regulated futures contracts. As described below, however, the Index, related indices or Subindices may in the future include over-the-counter contracts (such as swaps and forward contracts) traded on trading facilities that are subject to lesser degrees of regulation or, in some cases, no substantive regulation. As a result, trading in such contracts and the manner in which prices and volumes are reported by the relevant trading facilities may not be subject to the provisions of and the protections afforded by the U.S. Commodity Exchange Act or other applicable statutes and related regulations that govern trading on regulated U.S. futures exchanges or similar statutes and regulations that govern trading on regulated U.K. futures exchanges. In addition, many electronic trading facilities have only recently initiated trading and do not have significant trading histories. As a result, the trading of contracts on such facilities and the inclusion of such contracts in the Index, related indices or Subindices may be subject to certain risks not presented by U.S. or U.K. exchange-traded futures contracts, including risks related to the liquidity and price histories of the relevant contracts.

### **Data Sourcing, Data Publication and Calculation Risks Associated with the Index May Adversely Affect the Level of the Index or the Value of an Investment Linked to the Index**

The composition of the Index, related indices or Subindices is recalculated annually relying on historic price, liquidity and production data that are subject to potential errors in data sources or other errors that may affect the weighting of components of the Index, related indices or Subindices. Any discrepancies that require revision are not applied retroactively but will be reflected in the weighting calculations of the Index, related indices or Subindices for the following year. Additionally, BISL may not discover every discrepancy.

Furthermore, the weightings for the Index, related indices or Subindices are determined by BISL, which has a significant degree of discretion with respect to the Index, related indices and Subindices. This discretion would permit, among other things, changes to the composition of the Index, related indices or Subindices or changes to the manner or timing of the publication of the values of such indices at any time during the year if BISL deemed the changes necessary in light of factors that include, but are not limited to: (i) changes in liquidity of the underlying futures contracts that are included in the Index, related indices or Subindices or (ii) changes in legal, regulatory, sourcing or licensing matters relating to publication or replication of the Index, related indices or Subindices. In particular, without limitation, BISL’s access to and rights to use data in connection with calculating, publishing and licensing the Index, related indices and Subindices remain subject to the ongoing consent of the sources of such data (including, without limitation, exchanges), which consent can be revoked at any time. Further, the sources of such data reserve the right to revise the terms and conditions of access and use of their data upon notice to BISL. BISL reserves the right to modify the composition of the Index, related indices or Subindices on

an as-needed basis to minimize the impact of any loss of access to or revised terms of use with respect to such source data on the indices.

BISL has no obligation to take the needs of any parties to transactions involving the Index, related indices or Subindices into consideration when reweighting or making any other changes to the Index, related indices or Subindices.

### **Other Considerations**

The provisions and procedures set forth in this Methodology grant a significant degree of discretion BISL, as administrator of the Index, in a number of respects. BISL may exercise this discretion as it determines to be most appropriate. Furthermore, this Methodology does not address all possible issues relating to the Index, related indices or Subindices and any omissions or exceptions may be addressed as deemed to be appropriate. In addition, this Methodology and any other provisions or procedures relating to such indices may be amended at any time.

## CHAPTER 2. INDEX CONSTRUCTION

BCOMCA is composed of futures contracts on physical commodities. Unlike equities, which typically entitle the holder to a continuing stake in a corporation, commodity futures contracts normally specify a certain date for the delivery of the underlying physical commodity. To avoid the delivery process and maintain a long futures position, nearby contracts must be sold and contracts that have not yet reached the delivery period must be purchased. This process is known as “rolling” a futures position. BCOMCA is a “rolling index”.

### SECTION 2.1 INDEX CONSTRUCTION OVERVIEW

**The following overview does not purport to be a complete description of the Index and is qualified in its entirety by reference to the detailed information provided in applicable sections of this Methodology.**

The composition of the Index is rebalanced by BISL each year pursuant to the procedures set forth in this Methodology by index managers operating within the PROC (defined above) governance body under the oversight of the BOC (defined above) oversight function. Any material deviations or changes from established procedures are subject to review by such bodies. In addition, to the extent practicable, BISL may solicit stakeholder feedback, including by means of the Index Advisory Council. Once approved, the new composition of the Index is publicly announced and takes effect in the month of January immediately following the announcement.

The first step in constructing BCOMCA is to determine the relative liquidity and production percentages, following the same procedure used for the Bloomberg Commodity Index (BCOM). The Commodity Liquidity Percentage (“CLP”) for each futures contract (a “Designated Contract”) selected as a reference contract for commodity designated for potential inclusion in the Index (collectively, “Commodities”) is determined by taking a five-year average of the trading volume of the product and the historic U.S. dollar value of such futures contract and dividing the result by the sum of such products for all Designated Contracts. The Commodity Production Percentage (“CPP”) is also determined for each Commodity by taking a five-year average of production figures, adjusted by the historic U.S. dollar value of the applicable Designated Contract, and dividing the result by the sum of such products for all Commodities.

The Commodity Liquidity Percentage and the Commodity Production Percentage are then combined (using a ratio of 2:1) to establish the Commodity Index Percentage (“CIP”) for each Commodity. This Commodity Index Percentage is then adjusted in accordance with the diversification rules described in SECTION 1.2 above and SECTION 2.3 below to determine the Commodities that will be included in the Index (“Index Commodities”) and their respective percentage weights.

Following the CIPs determination, an additional calculation step determines the Bloomberg Commodity Carbon Tilted Target Weights or “Tilted CIP” (defined below in SECTION 2.7), to account for the Greenhouse Gas Emissions estimates from production of the underlying commodities referenced by each futures contract.

On each BCOM CIM Determination Date, the Tilted CIP are combined with the Settlement Prices of all Designated Contracts for such day to create the BCOMCA Commodity Index Multiplier ("CIM") for each Designated Contract. The BCOMCA CIM remain in effect throughout the ensuing year.

Once the BCOMCA CIMs are determined, the calculation of BCOMCA is an arithmetic process whereby the BCOMCA CIMs for the Index Commodities are multiplied by the respective prices in U.S. dollars for the applicable Designated Contracts. The products are then summed. The daily percentage change in this sum is then applied to the prior day's BCOMCA value to calculate the then-current BCOMCA value. For a complete description of the CIM calculation and Index level calculation see Section 2.8 and Section 3.1 of the BCOM Index Methodology.

## SECTION 2.2 COMMODITY SELECTION

This section references the corresponding one in the BCOM Index Methodology.

The definition of the Commodity Groups is made available in this Section, since it is explicitly referred to in SECTION 2.7 below.

### Commodity Groups

For purposes of applying the diversification rules referred to in SECTION 1.2 and described in SECTION 2.6, each of the Commodities eligible for inclusion in the Index are assigned to “Commodity Groups”. For completeness, the table below also shows the corresponding “Commodity Sector”, defined in SECTION 2.2(4) of the BCOM Index Methodology.

The Commodity Groups, and the Commodities composing each Commodity Group, are as follows:

Commodity Group	#	Symbol	Commodity	Commodity Sector
Energy	1	CL	WTI Crude Oil	Petroleum
	2	CO	Brent Crude Oil	Petroleum
	3	NG	Natural Gas	Petroleum
	4	HO	ULS Diesel	Petroleum
	5	QS	Low Sulphur Gas Oil	Petroleum
	6	XB	Unleaded Gasoline	Petroleum
Precious Metals	7	GC	Gold	Gold
	8	PL	Platinum	Platinum
	9	SI	Silver	Silver
Industrial Metals	10	HG	Copper	Copper
	11	LA	Aluminum	Aluminum
	12	LL	Lead	Lead
	13	LN	Nickel	Nickel
	14	LT	Tin	Tin
	15	LX	Zinc	Zinc
Livestock	16	LC	Live Cattle	Live Cattle
	17	LH	Lean Hogs	Lean Hogs
Grains	18	C	Corn	Corn
	19	S	Soybeans	Soybean Complex
	20	SM	Soybean Meal	Soybean Complex
	21	BO	Soybean Oil	Soybean Oil
	22	W	Wheat (Chicago)	Wheat
	23	KW	Wheat (KC HRW)	Wheat
Softs	24	CC	Cocoa	Cocoa
	25	CT	Cotton	Cotton
	26	KC	Coffee	Coffee
	27	SB	Sugar	Sugar

Table 1 - Commodity Groups



### **SECTION 2.3 CALCULATION OF THE COMMODITY LIQUIDITY PERCENTAGES**

This section references the corresponding one in the BCOM Index Methodology.

### **SECTION 2.4 COMMODITY PRODUCTION PERCENTAGES**

This section references the corresponding one in the BCOM Index Methodology.

### **SECTION 2.5 ALLOCATION OF COMMODITY PRODUCTION TO DERIVATIVE COMMODITIES**

This section references the corresponding one in the BCOM Index Methodology.

### **SECTION 2.6 CALCULATION OF THE INDEX PERCENTAGES**

This section references the corresponding one in the BCOM Index Methodology.

## **SECTION 2.7 CALCULATION OF THE INTERIM TILTED CIP**

During the Calculation Period, following the determination of the related CIPs, the GHG Emissions Estimates provided by selected Data Providers are used to determine the “Tilted CIP” for each Designated Contract.

Data Providers derive GHG Emissions Estimates from a range of LCA Models associated with the production processes of the physical asset of each Commodity eligible for inclusion in the Index. The LCA Models are selected such that the production processes resemble the specification of the physical asset underlying the Designated Contracts. The LCA Models and underlying datasets are reviewed periodically.

The LCA Models can differ for a variety of reasons including modelling assumptions of the processes, functional units, and parameter selection. Difference may also arise from the geographic coverage of the datasets.

The steps and the necessary input data to determine the Tilted CIP are described below.

## (1) Carbon Tilted Sectors

The 6 Commodity Groups defined in SECTION 2.2 are reorganized to produce 7 BCOMCA Commodity Groups as per Table 3 below in order to allow for a more detailed attribution of the Greenhouse Gas Emissions.

Table 2 below shows the BCOMCA Commodity Groups (“BCOMCA Groups”), with their respective Commodities eligible for inclusion in the Index:

BCOM Commodity Group	BCOMCA Group	#	Symbol	Commodity
Energy	Primary Energy	1	CL	WTI Crude Oil
		2	CO	Brent Crude Oil
		3	NG	Natural Gas
	Distillates	4	HO	ULS Diesel
		5	QS	Low Sulphur Gas Oil
		6	XB	Unleaded Gasoline
Precious Metals	Precious Metals	7	GC	Gold
		8	PL	Platinum
		9	SI	Silver
Industrial Metals	Industrial Metals	10	HG	Copper
		11	LA	Aluminum
		12	LL	Lead
		13	LN	Nickel
		14	LT	Tin
		15	LX	Zinc
Livestock	Livestock	16	LC	Live Cattle
		17	LH	Lean Hogs
Softs	Agriculture ex-Derived	18	CC	Cocoa
		19	CT	Cotton
		20	KC	Coffee
		21	SB	Sugar
		Grains	Agriculture ex-Derived	22
23	S			Soybeans
24	C			Corn
25	W			Wheat (Chicago)
Agriculture Derived	26			BO
	27		SM	Soybean Meal

Table 2 - BCOM Carbon Tilted Groups

The BCOM Energy Group is divided into two BCOMCA Groups:

- Primary Energy includes WTI Crude Oil, Brent Crude Oil and Natural Gas

- Distillates includes ULS Diesel, Low Sulphur Gas Oil and Unleaded Gasoline

The Grains and Softs BCOM Groups are reorganized into two different BCOMCA Groups:

- Agriculture ex-Derived includes Corn, Cocoa, Cotton, Coffee, Soybeans, Sugar, Wheat (Chicago), Wheat (KC HRW)
- Agriculture Derived includes Soybean Meal, Soybean Oil

## (2) GHG Emissions Estimates

During each Calculation Period and in relation to the Designated Contract  $i$ , the “GHG Emissions Estimate” (“ $GHG\_EE_i$ ”) is calculated by taking an average of the *GHG Emissions Estimates* produced by the relevant LCA models:

$$GHG\_EE_i = \frac{1}{n} \sum_{j=1}^n GHG\_EE_{i,j}$$

Where:

- $n$  means the total number of Data Providers.
- $j$  means the individual Data Provider.

## (3) Multiple LCA models GHG Estimates

During each Calculation Period and in relation to the Designated Contract  $i$  and a Data Provider  $j$ , the GHG Emissions Estimate is calculated by taking an average of the Emissions Estimates of each LCA Model (*Single Model  $GHG\_EE_{i,j}$* ) offered by Data Provider  $j$  associated with the Commodity underlying the Designated Contract  $i$ :

$$GHG\_EE_{i,j} = \frac{1}{m_{i,j}} \sum_{k=1}^{m_{i,j}} Single\ Model\ GHG\_EE_{i,j,k}$$

Where:

- $m_{i,j}$  means the total number of relevant LCA Models  $k$ .
- $k$  means the individual LCA Model

## (4) Multiple LCA models GHG Estimates for Precious and Industrial Metals

For the Commodities belonging to the Precious Metals and Industrial Metals BCOM Groups, the relevant GHG Emissions Estimate may be represented by two distinct routes: Primary Route, *i.e.* production from newly sourced raw material, and Secondary Route, *i.e.* production from recycled material.

Data Providers can deliver GHG Emissions Estimates from LCA Models that blend Primary and the Secondary Routes or GHG Emission Estimates of the two routes separately.

During each Calculation Period and in relation to the Designated Contract  $i$  and a Data Provider  $j$  the GHG

Emissions Estimate is calculated by considering the weighted average of the Emissions Estimates of each LCA Model (*Single Model GHG\_EE<sub>i,j</sub>*) offered by Data Provider j for the Primary Route and for the Secondary Route associated with the Commodity underlying the Designated Contract *i*:

$$GHG\_EE_{i,j} = \frac{WP_i}{m_{i,j}} \sum_{k=1}^{mp_{i,j}} \text{Primary Single Model } GHG\_EE_{i,j,k} + \frac{WS_i}{m_{i,j}} \sum_{k=1}^{ms_{i,j}} \text{Secondary Single Model } GHG\_EE_{i,j,k}$$

Where:

- *WP<sub>i</sub>* means the Production Percentages for Primary Route associated to the Designated Contract *i* as shown in Table 3
- *WS<sub>i</sub>* means the Production Percentages for Secondary Route associated to the Designated Contract *i* as shown in Table 3
- *mp<sub>i,j</sub>* means the total number of relevant LCA Models *k* for the Primary Route<sup>3</sup>.
- *ms<sub>i,j</sub>* means the total number of relevant LCA Models *k* for the Secondary Route.
- *k* means the individual LCA Model

Table 3 below illustrates the Primary and Secondary Production Percentages used by BISL<sup>4</sup> to determine the GHG Emission Estimates for the Commodities with separate LCA Models for Primary and Secondary Route.

Calculation Period	BCOMCA Group	#	Symbol	Commodity	WP	WS
2023	Industrial Metals	1	LA	Aluminum	81.42823%	18.57177%
		2	LL	Nickel	30.0503%	69.94964%
		3	LN	Lead	73.40308%	26.59692%
	Precious Metal	4	SI	Silver	99.97897%	0.02103%

Table 3 - Primary and Secondary Production Percentages for Commodities with separate LCA models for Primary and Secondary Route.

## (5) GHG Tilted Weights

The calculation of the “GHG Tilted Target Weights” is based on the related CIPs determined during the BCOM Calculation Period and the contribution to each Designated Contract *i* of the corresponding GHG Emissions Estimates.

## (6) Commodity Emissions Factor

During each Calculation Period and in relation to the Designated Contract *i*, the Commodity Emissions Factor (*CEF<sub>i</sub>*) is calculated as follows:

<sup>3</sup> For any Commodity each Data Provider could deliver multiple Primary or Secondary LCA models, differing for geographical location or production process characteristics.

<sup>4</sup> Primary and Secondary Production Percentages are sourced from Data Providers on a yearly basis.

$$CEF_i = \frac{1}{(GHG\_EE_i)^\alpha}$$

Where:

- $GHG\_EE_i$  means the GHG Emission Estimate per unit of production associated with the Designated Contract  $i$
- $\alpha$  means the “penalty-reward factor”, through which the single GHG Emission Estimate can be modified to contribute more or less to the corresponding Emissions Factor. The default value for  $\alpha$ , unless expressly stated, is 1.

### (7) BCOM Implied Weight

During each Calculation Period and in relation to the Designated Contract  $i$  within the relevant BCOMCA Group  $h$  as defined in SECTION 2.7 (1), the “BCOM Implied Weights” are calculated as follows:

$$\omega_{imp\ i} = \frac{CIP_i}{\sum_{i \in BCOMCA\ Group\ h} CIP_i}$$

Where:

- $BCOMCA\ Group\ h$  means the set of Designated Contracts comprised in the BCOMCA Group  $h$  as defined in Table 2.
- $CIP_i$  is the annually determined BCOM Commodity Index Percentage for the Designated Contract  $i$ .

Table 4 below illustrates an example of the calculation of the BCOM Implied Weights for the Designated Contracts comprised in the BCOM Energy Commodity Group:

BCOM Commodity Group	BCOMCA Group	#	Symbol	Commodity	2023 CIP	$\omega_{imp}$
Energy	Primary Energy	1	CL	WTI Crude Oil	7.7717%	33.8798%
		2	CO	Brent Crude Oil	7.2283%	31.5113%
		3	NG	Natural Gas	7.9389%	34.6088%
	Distillates	4	HO	ULS Diesel	2.0987%	29.9444%
		5	QS	Low Sulphur Gas Oil	2.1962%	31.3362%
		6	XB	Unleaded Gasoline	2.7136%	38.7194%

Table 4 - BCOM Implied Weights calculation example

### (8) Emission Implied Weight

During each Calculation Period and in relation to the Designated Contract  $i$  within the relevant BCOMCA Group  $h$ , the “Emission Implied Weight” is calculated as follows:

$$\omega_{ghg\ i} = \frac{CEF_i}{\sum_{i \in EC_h} CEF_i}$$

Where :

- $EC_h$  means the set of Designed Contracts in the BCOMCA Group  $h$  where  $CIP_i$  is greater than zero:

$$EC_h = \{i \in \text{BCOMCA Group}_h \mid CIP_i > 0\}$$

### (9) GHG Tilted Weights

During each Calculation Period and in relation to the Designated Contract  $i$  within the relevant BCOMCA Group  $h$ , the “GHG Tilted Weight” is calculated as follows:

$$\omega_{tilt_i} = \begin{cases} \frac{(1 + \omega_{imp_i}) \times (1 + \omega_{ghg_i})^{\beta_h} - 1}{\sum_{i \in SC_h} ((1 + \omega_{imp_i}) \times (1 + \omega_{ghg_i})^{\beta_h} - 1)}, & CIP_i > 0 \\ 0, & CIP_i = 0 \end{cases}$$

Where:

- $\beta_h$  means the “Tilt Factor” assigned to the BCOMCA Group  $h$ , used to modify the amount of tilting applied.

### (10) Interim Tilted CIP

During each Calculation Period and in relation to the Designated Contract  $i$ , the “Interim Tilted CIP” is calculated as follows:

$$ITilted\ CIP_i = SW_i \times \omega_{tilt_i}$$

Where:

- $SW_i$  means the cumulated weight of the BCOMCA Group  $h$ :

$$SW_i = \sum_{i \in \text{BCOMCA Group}_h} CIP_i$$

## SECTION 2.8 CALCULATION OF THE TILTED CIP

Following the determination of the Interim Tilted CIP ( $ITilted\ CIP_i$ ), further steps are taken in order to constrain the final “Tilted CIP” for each Designated Contract included in the Index<sup>5</sup>.

The specific rule applied to BCOMCA is that no single commodity may constitute more than three times the corresponding BCOM Commodity Index Percentage (CIP) of the Index:

$$Max\ ITilted\ CIP_i = 3 \times CIP_i$$

### Step A - Single Commodity Maximum Limit

#### Reducing Any Commodity Interim Tilted CIP over 3x the corresponding BCOM CIP

During each Calculation Period and in relation to each Designated Contract  $i$  in the BCOMCA Commodity Group  $h$ , if the  $ITilted\ CIP_i$  is above the “Max Interim Tilted CIP”:

$$ITilted\ CIP_i > Max\ ITilted\ CIP_i$$

Where:

$$Max\ ITilted\ CIP_i = CIP\_Multiplier \times CIP_i$$

And  $CIP\_Multiplier = 3$ .

BISL may, from time to time, exercise discretion in setting the CIP Multiplier for this rule in furtherance of the objectives underlying BCOMCA.

1. Compute the difference between  $Max\ ITilted\ CIP_i$  and  $ITilted\ CIP_i$ :

$$Res_i = Max\ ITilted\ CIP_i - ITilted\ CIP_i$$

2. Allocate the difference  $Res_i$  proportionally among the other Index Commodities  $j$  within the same BCOMCA  $h$  Commodity Group not affected by this rule:

$$ITilted\ CIP_j = ITilted\ CIP_j \times \left( 1 + \frac{Res_i}{\sum_{j \in BCOMCA\ Group\ h, j \neq i} ITilted\ CIP_j} \right)$$

3. Set this  $ITilted\ CIP_i$  to  $Max\ ITilted\ CIP_i$ .
4. Repeat these steps for any Designated Contract  $i$  in the BCOMCA Commodity Group, until all  $ITilted\ CIP_i$  in the group are less than the corresponding  $Max\ ITilted\ CIP_i$ .

The percentages calculated following the steps above, rounded to 8 decimal places, are the *Tilted CIP<sub>i</sub>*,

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<sup>5</sup> Similarly to the principles and steps of the diversification rules specified in SECTION 1.2 and SECTION 2.6 in the BCOM Index Methodology.



which should sum to 100%.

## SECTION 2.9 STRATEGY PARAMETERS

The parameters and the rules used for the tilting of the BCOM CIPs are defined in this Section.

### Weighted Emissions per Unit of Production

As described in SECTION 2.7, the emissions resulting from the production of a unit of the commodity underlying the Designated Contract  $i$  is given by  $GHG\_EE_i$ .

During each Calculation Period and in relation to the BCOMCA Group  $h$ , the “Weighted Emissions per Unit of Production” is calculated for both BCOM and BCOMCA as follows:

$$WE_{BCOM,h} = \sum_{i \in BCOMCA \text{ Group } h} CIP_i \times GHG\_EE_i$$

$$WE_{BCOMCA,h} = \sum_{i \in BCOMCA \text{ Group } h} Tilted \ CIP_i \times GHG\_EE_i$$

Where:

- $GHG\_EE_i$  means the GHG Emission Estimate per unit of production associated with the Designated Contract  $i$
- $i$  means the Designated Contract  $i$  within the BCOMCA Group  $h$

### Emission Difference per Unit of Production

During each Calculation Period and in relation to the BCOMCA Group  $h$ , the Emission Difference per Unit of Production is positive number calculated as follows:

$$ED_h = - \frac{WE_{BCOMCA,h} - WE_{BCOM,h}}{WE_{BCOM,h}}$$

At the same time, the “Aggregated Emission Difference per Unit of Production” ( $AED$ ) is calculated as follows:

$$AED = \sum_{h \in BCOMCA \text{ Groups}} SW_h \times ED_h$$

Where:

- $SW_i$  means the cumulated weight of the BCOMCA Group  $h$ :

$$SW_i = \sum_{i \in BCOMCA \text{ Group } h} CIP_i$$

Table 5 below illustrates an example of the calculation of the Emission Differences per Unit of Production of all the BCOMCA Groups, based on hypothetical Tilt Factors.

BCOMCA Group	Commodity	Tilt Factor	SW	BCOM CIP	BCOMCA CIP	ED
Agriculture Ex-Derived	Cotton	<b>8.492</b>	22.82%	1.5589%	0.3935%	<b>42.23%</b>
	Wheat (KC HRW)	8.492	22.82%	1.7543%	2.6152%	
	Coffee	8.492	22.82%	2.8579%	0.4612%	
	Soybeans	8.492	22.82%	5.7840%	4.1498%	
	Sugar	8.492	22.82%	2.5559%	4.9901%	
	Wheat (Chicago)	8.492	22.82%	2.7939%	2.7697%	
	Corn	8.492	22.82%	5.5133%	7.4386%	
Agriculture Derived	Soybean Oil	<b>8.492</b>	6.79%	3.2648%	0.8714%	<b>23.11%</b>
	Soybean Meal	8.492	6.79%	3.5285%	5.9220%	
Livestock	Live Cattle	<b>0.623</b>	5.06%	3.3187%	2.7126%	<b>7.26%</b>
	Lean Hogs	0.623	5.06%	1.7432%	2.3494%	
Industrial Metals	Copper	<b>3.286</b>	15.94%	5.2289%	3.0391%	<b>53.26%</b>
	Aluminum	3.286	15.94%	4.0857%	1.0841%	
	Nickel	3.286	15.94%	2.7797%	0.9886%	
	Lead	3.286	15.94%	0.9361%	8.2892%	
	Zinc	3.286	15.94%	2.9053%	2.5347%	
Precious Metals	Gold	<b>0.328</b>	19.44%	14.8532%	11.3089%	<b>23.76%</b>
	Silver	0.328	19.44%	4.5902%	8.1345%	
Primary Energy	WTI Crude Oil	<b>1.870</b>	22.94%	7.7717%	6.6769%	<b>6.53%</b>
	Brent Crude Oil	1.870	22.94%	7.2283%	10.0900%	
	Natural Gas	1.870	22.94%	7.9389%	6.1720%	
Distillates	ULS Diesel	<b>1.870</b>	7.01%	2.0987%	2.2234%	<b>2.66%</b>
	Unleaded Gasoline	1.870	7.01%	2.1962%	1.7923%	
	Low Sulphur Gas Oil	1.870	7.01%	2.7136%	2.9928%	

Table 5 - Sample Calculation of Emission Differences per Unit of Production

The Aggregated Emission Difference per Unit of Production based on the data in Table 5 is equal to:

$$AED = 26.367\%$$

## Aggregated Emission Difference per Unit of Production Threshold

The BCOMCA Index initial Tilt Factors configuration results in an Aggregated Emission Difference per Unit of Production greater than 20% ( $AED_{Threshold}$ ) on 2023 and on average across the years from 2012 to 2023:

$$\frac{1}{12} \sum_{y=2012}^{2023} AED_y > 20\%$$

On each Calculation Period following the index launch date, the determination of the new BCOM Commodity Index Percentages (CIPs) and the latest available set of the GHG Emissions Estimates (GHG\_EE) will determine a potentially different Aggregated Emission Difference per Unit of Production, which might fall below the initial condition on AED.

During each Calculation Period, a review of the  $AED$  is performed to verify whether its value is greater than 18% ( $AED_{Trigger}$ ). When this condition is not met, the  $AED$  is recomputed using different combinations of Tilt Factors that would increase the  $AED$  back to a value greater than 20%.

## Tilt Factors Configurations

Table 6 below contains the set of Tilt Factors Configurations, assigned to each BCOMCA Group  $h$ , that will be used during each Calculation Period to verify the condition on the Aggregated Emission Difference per Unit of Production:

Configuration	1	2	3	4	5	6	7	8	9
Livestock	0.311	0.403	0.507	0.625	<b>0.757</b>	0.908	1.079	1.270	1.482
Industrial Metals	1.048	1.590	2.327	3.287	<b>4.478</b>	5.912	7.644	9.839	12.951
Precious Metals	0.174	0.223	0.274	0.328	<b>0.385</b>	0.444	0.508	0.575	0.646
Agriculture Ex-Derived	0.709	1.040	1.489	2.105	<b>2.934</b>	4.006	5.320	6.862	8.633
Agriculture Derived	0.709	1.040	1.489	2.105	<b>2.934</b>	4.006	5.320	6.862	8.633
Primary Energy	0.725	1.032	1.412	1.868	<b>2.398</b>	2.988	3.625	4.294	4.985
Distillates	0.725	1.032	1.412	1.868	<b>2.398</b>	2.988	3.625	4.294	4.985

Table 6 - Tilt Factors Configurations

Each value in the table represents the Tilt Factor  $\beta_h$  corresponding to the BCOMCA Group  $h$  and to the Configuration  $c$ . Column 5 indicates the set of Tilt Factors selected at the inception of the BCOMCA index, achieving an AED greater than 20% for 2023 and on average from 2012 to 2023.

## Yearly Revision of the Tilt Factors

Following the publication of the BCOM Commodity Index Percentages (as per indications in SECTION 2.6 of the BCOM methodology<sup>6</sup>), BISL will review the Aggregated Emission Difference per Unit of Production.

During the Calculation Period for year  $y^*$ , the computed Aggregated Emission Difference per Unit of Production will be based on:

- The new set of Commodity Index Percentages (CIPs) produced for BCOM
- The latest available GHG Estimates received from the Providers
- The latest set of Tilt Factors  $\beta_{s,h,y^*-1}$ , corresponding to column  $s$  in Table 6, chosen to produce the Tilted CIP for each BCOMCA group  $h$  during the Calculation Period for year  $y^*-1$
- The set of Tilt Factors  $\beta_{s+1,h,y^*-1}$ , corresponding to column  $s+1$  in Table 6, and the relevant Tilted CIP for each BCOMCA group  $h$

$$AED_{y^*} = \sum_{h \in \text{BCOMTC Groups}} SW_{h,y^*} \times ED_{h,y^*}$$

On the same Calculation Period for year  $y^*$ , the Aggregate Emission Difference Upper Bound  $AED\_UB_{y^*}$  is calculated as the Aggregate Emission Difference obtained by using the Tilt Factors  $\beta_{s+1,h,y^*-1}$ , corresponding to the Tilt Factors in the column to the right of the column used as the latest set of Tilt Factors  $\beta_{s,h,y^*-1}$ .

If the computed Aggregated Emission Difference per Unit of Production  $AED_{y^*}$  is still equal or greater than  $AED_{Trigger}$  and the Aggregate Emission Difference Upper Bound  $AED\_UB_{y^*}$  is greater than  $AED_{Threshold}$ , the Tilt Factors for year  $y^*$  will be set equal to the Tilt Factors used in year  $y^*-1$ , otherwise the Tilt Factors  $\beta_{s,h,y^*-1}$  will be selected by identifying the minimum Tilt Factors Configuration from Table 6 that allows to meet the condition  $AED_{y^*} \geq AED_{Threshold}$ .

The Configuration of Tilt Factors satisfying the condition on the re-computed Aggregated Emission Difference per Unit of Production ( $AED_{y^*}$ ) being equal or greater than the threshold  $AED_{Threshold}$  will be used in the determination of the Tilted CIP and corresponding BCOMCA CIMs on the Determination Date for year  $y^*$ .

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<sup>6</sup> Consistently with the BCOM Index Methodology: "BISL calculates the Commodity Index Percentages for each year in the third or fourth quarter of the year immediately prior to the year the relevant Commodity Index Percentages are effective and publishes the results as promptly as practicable following the calculation."

## **SECTION 2.10 CALCULATION OF THE INDEX MULTIPLIERS**

This section references the corresponding one (SECTION 2.7) in the BCOM Index Methodology, where the BCOM CIPs used in the calculation of the Commodity Index Multipliers (CIMs) are the “Carbon Tilted Target Weights”.

## **SECTION 2.11 ONGOING CALCULATION OF WAV1 AND WAV2**

This section references the corresponding one (SECTION 2.8) in the BCOM Index Methodology.

## **CHAPTER 3. COMPUTATION OF THE INDICES**

BISL calculates BCOMCA (which is calculated on an “excess return” basis).

## **SECTION 3.1 CALCULATION OF THE BLOOMBERG COMMODITY CARBON TILTED INDEX**

This section references the corresponding one in the BCOM Index Methodology.

The BCOM Carbon Tilted Total Return Index (BCOMCAT) is calculated according to SECTION 3.2 in the BCOM Index Methodology.

## **SECTION 3.2 MARKET DISRUPTION EVENTS**

Market Disruption Events are treated in the same way as in the BCOM Index Methodology (SECTION 3.3), including APPENDIX G.

## APPENDIX

### APPENDIX A GLOSSARY OF TERMS

This Appendix references the corresponding one in the BCOM Index Methodology; it is repeated here for convenience and enriched with terms specifically related to the BCOMCA features. For clarity, in all definitions below by "Methodology" it is meant the "BCOMCA Methodology" which, itself, refers to the BCOM Methodology.

*"Adjustment Factor"* or *"AF"* means the factor by which the Commodity Index Multipliers are adjusted to provide continuity in WAV values from one year to the next. The Adjustment Factor is computed in accordance with SECTION 2.10 of the Methodology.

*"Bloomberg"* means Bloomberg Finance L.P. and its affiliates.

*"BCOMCA"* means the Bloomberg Commodity Carbon Tilted Index<sup>SM</sup>.

*"Business Day"* means any day on which the sum of the CIPs (and, consequently Tilted CIPs) for those Index Commodities that are open for trading is greater than 50%. For purposes of this definition, the CIPs (and, consequently Tilted CIPs) used during any calendar year are those calculated in the preceding year and applied on the CIM Determination Date for that year; provided, however, that on any day during such calendar year falling prior to or on the CIM Determination Date, the preceding year's CIPs (and, consequently Tilted CIPs) will be used for purposes of determining the existence of a Business Day.

*"Calculation Period"* means, for each year for which the Index is calculated, the sixth month of the year preceding such year of calculation.

*"CBOT"* means the Chicago Board of Trade, a division of the CME Group.

*"CIM Determination Date"* means the date from which the values used in calculating the Commodity Index Multipliers will be determined for each year that the Index is calculated. This will be the fourth Business Day of that year, or as otherwise determined in accordance with SECTION 2.10 of the Methodology.

*"COMEX"* means the Commodities Exchange division of the CME Group

*"Commodities"* means the commodities listed in SECTION 2.2 of the Methodology as eligible for inclusion in the Index.

*"Commodity Group"* means the group of Commodities to which each Commodity is assigned for the purpose of applying the diversification rules discussed in the Methodology. SECTION 2.2 of the Methodology lists the Commodity Groups and their corresponding Commodities.

*"Commodity Index Multiplier"* or *"CIM"* is a factor that is computed annually on the CIM Determination

Date for each Index Commodity for purposes of implementing the annual re-weighting of the Index. It is calculated in accordance with SECTION 2.10 of the Methodology.

*“Commodity Index Percentage” or “CIP”* is derived by summing:

- i. 2/3 of the Commodity Liquidity Percentage for each Index Commodity and
  - ii. 1/3 of the Commodity Production Percentage for that Index Commodity,
- to determine the percentage weighting of each Index Commodity. The Commodity Index Percentages are adjusted in accordance with SECTION 2.6 of the Methodology.

*“Commodity Liquidity Percentage” or “CLP”* is the liquidity weighting assigned to each Index Commodity that is combined with the production weighting, or Commodity Production Percentage, assigned to each Index Commodity to derive the Commodity Index Percentage for that Index Commodity. The Commodity Liquidity Percentages are calculated in accordance with SECTION 2.3 of the Methodology.

*“Commodity Production Percentage” or “CPP”* is the production weighting assigned to each Index Commodity that is combined with the liquidity weighting, or the Commodity Liquidation Weighing, assigned to each Index Commodity to derive the Commodity Index Percentage for that Index Commodity. The Commodity Production Percentages are calculated in accordance with SECTION 2.4 of the Methodology.

*“Commodity Production Weight” or “CPW”* as set forth in SECTION 2.4 is the production data, adjusted to the same unit terms as the Designated Contract for that Commodity. This number is then divided by 1,000,000.

*“Commodity Sector”* refers to a Primary Commodity along with its Derivative Commodities. Commodity Sectors are described in SECTION 2.2 of the Methodology.

*“Commodity Sector Allocation Percentage” or “CSAP”* means, for each Index Commodity in a given Commodity Sector,

- i. the Commodity Liquidity Percentage for that Index Commodity divided by
- ii. the sum of the Commodity Liquidity Percentages for all Index Commodities in that Commodity Sector.

The Commodity Sector Allocation Percentage is calculated as described in SECTION 2.5 of the Methodology.

**“Data Provider”** means the company that provides the GHG Emissions Estimate(s), using LCA Models, for each physical asset associated with a Designated Contract.

*“Derivative Commodity”* means an Index Commodity that is principally produced or derived from another Index Commodity.

*“Designated Contract”* means, with respect to a Commodity, the futures contract selected as the reference contract from which price and trading volume data for the Commodity will be obtained to calculate the

Index. The Designated Contracts, and the futures exchanges on which they trade, are identified in SECTION 2.2 of the Methodology.

"FIA" means the Futures Industry Association.

"Index Oversight Committee" means the oversight committee created to provide oversight and accountability over all aspects of the Index determination process.

"GHG Emissions" means the Greenhouse Gas emissions associated with the production cycle of the physical Commodities underlying the *Designated Contracts*. Greenhouse Gas (GHG) Emissions are assessed on a per unit of production basis, and measured in Kg of Carbon Dioxide (CO<sub>2</sub>) equivalent per Kg of unit of product. The CO<sub>2</sub> equivalent is used as a measure of the Global Warming Potential (GWP) as defined in the IPCC's 5th Assessment Report (AR5). These gases are methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>), hydrofluorocarbons (HFCs), nitrous oxide (N<sub>2</sub>O), nitrogen trifluoride (NF<sub>3</sub>), perfluorocarbons (PFCs), sulphur hexafluoride (SF<sub>6</sub>).

"Hedge Roll Period" means the period of five Business Days, beginning with the fifth Business Day through and including the ninth Business Day of each month, subject to adjustment as described in SECTION 3.2.

"Index" means the Bloomberg Commodity Carbon Tilted Index<sup>SM</sup>.

"Index Commodity" means a Commodity included in the Index. The Commodities currently included in the Index are listed in SECTION 2.2 of the Methodology.

"Index Administrator" means Bloomberg Index Services Limited (BISL)

"Initial Commodity Index Multiplier" or "ICIM" means for each Index Commodity, the initial Commodity Index Multiplier, which is then adjusted by the Adjustment Factor to determine the Commodity Index Multiplier. The Initial Commodity Index Multipliers are calculated in accordance with SECTION 2.10 of the Methodology.

"Interim Commodity Index Percentage" or "ICIP" means the initial percentage weighting assigned to each Commodity, which, when adjusted to reduce, increase, or eliminate a percentage weighting that would otherwise have either a disproportionate or negligible impact on the Index, constitutes the Commodity Index Percentage assigned to each Index Commodity. The Interim Commodity Index Percentages are calculated in accordance with SECTION 2.6 of the Methodology.

"ICE" means the Intercontinental Exchange

"Index Levels" means, in respect of the Index and an index Business Day, the value of the Index on such index Business Day, calculated in accordance with the methodology described herein.

"Lead Future" means, for each Index Commodity, the futures contract month designated in SECTION 2.11 of the Methodology, under the current month for each Designated Contract.



***“Life Cycle Assessment Model (LCA Model)”*** means a model that is part of standardised approach to quantitatively assess the environmental impact of a product at each stage of its life cycle. This includes inputs and processes involved with creating the product, the impact of the product usage and end-of-life treatment.

*“Liquidity Averaging Period”* means the five years up to and including the year prior to the applicable Calculation Period. For example, the Calculation Period for the determination of the CIPs (and, consequently Tilted CIPs) in respect of the calculation of the Index for 2022 (*i.e.*, 2021), the applicable Liquidity Averaging Period is the years 2016 to 2020, inclusive.

*“LME”* means the London Metals Exchange.

*“Next Future”* means, for each Commodity, the futures contract month designated in Table 9 of the Methodology, set forth in the column next to the current month. In December, the first column, January, designates the column for the Next Future.

*“NYMEX”* means the New York Mercantile Exchange, a division of the CME Group

*“Primary Commodity”* means an Index Commodity from which another Index Commodity is principally produced or derived.

*“Production Averaging Period”* means the most recent five-year period for which world production data for all Index Commodities are available as of the applicable Calculation Period. For example, the Calculation Period for the determination of the CIPs (and, consequently Tilted CIPs) for the calculation of the Index for 2022 (*i.e.*, 2021), the Production Averaging Period comprises the years 2014 to 2018, inclusive.

*“Roll Period”* means the period of five Business Days, beginning with and including the sixth Business Day through and including the tenth Business Day of each month.

*“Settlement Price”* means, for each Designated Contract and a given day, the official settlement price for the relevant contract month as published by the futures exchange on which the Index Commodity trades for such day.

*“WAV”* means the weighted average values used in calculation of the Index, which can be in the form of *“WAV1”* or *“WAV2”*.

*“WAV1”* means the weighted average value that is calculated by summing the product for each Index Commodity of

- i. the price for the applicable Lead Future in U.S. dollars and
- ii. the applicable Commodity Index Multiplier.

WAV1 is calculated in accordance with SECTION 2.11 of the Methodology.

*“WAV2”* means the weighted average value calculated by summing the product for each Index Commodity

of

- i. the price for the applicable Next Future in U.S. dollars and
- ii. the applicable Commodity Index Multiplier.

WAV2 is calculated in accordance with SECTION 2.11 of the Methodology.

## **APPENDIX B ADDITIONAL NOTES ON INDEX CONSTRUCTION**

### **Historical Data**

The historical BCOMCA index levels before July 2014 have been generated under the assumption of no Market Disruption Events.

The 30/12/2011 has been selected as the index start date for BCOMCA, with a base value equal to 100. The index levels produced for the Business Days preceding and including the Determination Date in January 2012 have been generated ad hoc, assuming an Adjustment Factor equal to 1, FPD\_S (Settlement Prices) as of the 30/12/2011 and the Commodity Index Percentages (CIPs) determined in 2012 and assumed flat in 2011. From the Determination Date in January 2012, the calculations have been following the standard rules in the BCOM methodology.

The BCOMCA index levels before 2023 have been generated using the configuration of Tilt Factors selected for the BCOMCA launch year 2023 (Configuration 5).

**APPENDIX C ESG DISCLOSURES**

EXPLANATION OF HOW ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY			
1. Name of the benchmark administrator.		Bloomberg Index Services Limited (“BISL”)	
2. Type of benchmark.		Other	
3. Name of the benchmark or family benchmarks.		Bloomberg Commodity Carbon Tilted Index	
4. Does the benchmark methodology for the benchmark or family of benchmarks take into account ESG factors?		Yes	
<p>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.</p> <p>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.</p>			
a) List of environmental factors considered:	Greenhouse Gas (GHG) emissions	Weighting	<p>Within each BCOMCA commodity group, the tilting process aims to reduce exposure to Commodities with higher CO<sub>2</sub> Estimated Emissions and to increase exposure to those Commodities with a lower CO<sub>2</sub> Estimated Emissions within that group.</p> <p>To achieve this, GHG Emissions Estimates are used to determine the “Carbon Tilted Target Weights” for each Designated Contract.</p> <p>See Section 2.7 of this methodology document for more details.</p>
	Degree of exposure of the portfolio to the sectors listed in Sections A to H and Section L of Annex I to Regulation (EC) No 1893/2006 as percentage of the total weight in the portfolio.	N/A	The Index does not take into account this ESG factor in the methodology
b) List of social factors considered:	Weighted average percentage of benchmark constituents in the controversial weapons sector.	N/A	The Index does not take into account this ESG factor in the methodology
	Weighted average percentage of benchmark constituents in the tobacco sector.	N/A	The Index does not take into account this ESG factor in the methodology
c) List of governance factors considered:	Percentage of underlying funds with stewardship policies in place, including measures for the planning and management of resources.	N/A	The Index does not take into account this ESG factor in the methodology

<p><b>6.</b> 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.</p> <p>Please explain how those ESG factors are used for the selection, weighting or exclusion of underlying assets.</p> <p>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.</p> <p>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</p>	
a) List of environmental factors considered:	As above
b) List of social factors considered:	As above
c) List of governance factors considered:	As above
<b>7.</b> Data and standards used.	
<p>a) Data input.</p> <p>(i) Describe whether the data are reported, modelled or, sourced internally or externally.</p> <p>(ii) Where the data are reported, modelled or sourced externally, please name the third party data provider.</p>	<p>ESG data for the benchmarks is sourced externally from:</p> <p>Sphera - modelled GHG emissions data based on Sphera's Life Cycle Assessment (LCA) database. The dataset is managed through Sphera's ESG GaBi LCA databases.</p> <p>See more details in:  <a href="https://gabi.sphera.com/uk-ireland/support/gabi/gabi-modelling-principles/">https://gabi.sphera.com/uk-ireland/support/gabi/gabi-modelling-principles/</a></p> <p>Sphera contact details:  <a href="https://sphera.com/contact-us/">https://sphera.com/contact-us/</a></p>
<p>b) Verification and quality of data</p> <p>Describe how data are verified and how the quality of those data is ensured.</p>	<p>The Indices use the following external data providers, all of which have robust governance and processes in place to validate the quality and reliability of the data.</p> <p><b>Sphera</b></p> <p>To ensure accuracy and consistency, Sphera's LCA data products are multi-standard compliant and widely accepted and/or recommended by other standardization bodies and associations such as EPD program operators or the WBCSD GHG Protocol.</p> <p>All data is assessed quantitatively and not based on qualitative judgement or ratings (i.e. there is no good, bad, ranked from 1-5, scoring systems etc.).</p> <p>Thorough internal quality control of the quantitative data applied during its development (e.g. plausibility, comparisons to other industry data, closed mass/carbon/energy balance in process datasets, ...) by dedicated LCA experts and domain experts (e.g. LCA and sector experts for metals and mining, energy production, agriculture, aerospace, construction industry etc.). The methodology is publicly available:  <a href="https://sphera.com/wp-content/uploads/2022/02/MODELING-PRINCIPLES-GaBi-">https://sphera.com/wp-content/uploads/2022/02/MODELING-PRINCIPLES-GaBi-</a></p>

	<p><a href="#">Databases-2022.pdf</a></p> <p>Sphera’s LCA data products are revised throughout an annual update process, checked against several aspects listed in the “GaBi Modelling Principles” (see link above) and are released in a bi-annual rhythm.</p> <p>The database and data development process is DEKRA verified (see <a href="https://www.dekra.com/en/certificates-and-test-marks/">https://www.dekra.com/en/certificates-and-test-marks/</a>).</p> <p>Results from the LCA models are documented and made available online:  <a href="https://sphera.com/product-sustainability-gabi-data-search/">https://sphera.com/product-sustainability-gabi-data-search/</a></p>
<p>c) Reference standards</p> <p><i>Describe the international standards used in the benchmark methodology.</i></p>	<p>ISO Standards used to calculate GHG emissions utilising the LCA Models:</p> <p>ISO 14040:2006  Environmental management – Life cycle assessment – Principles and framework  <a href="https://www.iso.org/standard/37456.html">https://www.iso.org/standard/37456.html</a></p> <p>ISO 14044:2006  Environmental management – Life cycle assessment – Requirements and guidelines  <a href="https://www.iso.org/standard/38498.html">https://www.iso.org/standard/38498.html</a></p>
<p><b>Date on which information has been last updated and reason for the update:</b></p>	<p>May 2023 (first publication)</p>

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