



IHS Markit™

IHS Markit Global Carbon Index Guide

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IHS Markit Global Carbon Index Guide

The IHS Markit Global Carbon Index is designed to measure the performance of the global carbon credit market. Carbon credit futures are utilized to access carbon credit markets due to their liquidity and accessibility to investors. The eligible carbon credit futures for the index are selected based on the most liquid segments of the relevant markets. The index is weighted according to the trade volumes of eligible constituent programs subject to a capping methodology. Capping is applied on a regional basis with regions being defined as EMEA, Americas, and APAC, as well as on a program-level basis within each region to ensure diversification.

The IHS Markit Global Carbon Index is rebalanced twice a year at the month-end of May and November (the "rebalancing date") and currently consists of European Union Allowance (EUA), California Carbon Allowance (CCA), and Regional Greenhouse Gas Initiative (RGGI) carbon credit futures.

The carbon credit futures in the IHS Markit Global Carbon Index must meet all the criteria described below as of the close of business three trading days prior to the November rebalancing date provided that the relevant carbon credit futures data can be verified, at Markit Indices Limited's sole discretion, as of such date ("constituent selection cut-off date"). The new index composition becomes effective on the first trading day of December.

All IHS Markit indices are priced based on multiple data sources. The IHS Markit Global Carbon Index uses multi-source pricing: ICE Futures Pricing for EUA contracts, and IHS Markit OPIS Pricing for CCA and RGGI contracts.

This document covers the index selection rules and calculation methodology.

Publication of the Index

The index is calculated at the end of each trading day and re-balanced at the end of May and November each year. The index is calculated on the basis of end-of-day price assessments using ICE and OPIS prices for the respective carbon credit futures on each trading day defined in the index calculation calendar. The index calculation calendar is available in the Indices section on <http://www.markit.com/indices> under Calendar for registered users. Index data and carbon credit futures price information is also available from the main information vendors.

The index calculation calendar conforms to the New York Stock Exchange (NYSE) trading calendar:

- Pricing Takes Place on Each NYSE Trading Day
- Index is Calculated on Each NYSE Trading Day and the Last Calendar Days of May and November Each Year

Carbon Credit Selection Rules

The following selection criteria are used to determine the index constituents:

- Accessibility of Futures Markets
- Liquidity and Contract Selection
- Maturity of the Program

Accessibility of Futures Markets

The IHS Markit Global Carbon Index includes only carbon credit futures that can be easily accessed by institutional investors for trading purposes. Markets restricting trading within carbon credit futures are not eligible. Specifically, the following markets have been deemed eligible:

- European Union Allowance (EUA)
- California Carbon Allowance (CCA)
- Regional Greenhouse Gas Initiative (RGGI)

IHS Markit may consult with the IHS Markit Global Carbon Index Advisory Committee to review potential carbon credit futures for inclusion or existing carbon credit futures for exclusion dependent on the developments in the respective markets. Any decision as to the eligibility or ineligibility of a carbon credit futures contract will be published and the index rules will be updated accordingly.

Liquidity and Contract Selection

The IHS Markit Global Carbon Index includes only carbon credit futures that are liquid to ensure that the index can be replicated. Programs whose carbon credit futures have limited trading volume are not eligible in the index. Specifically, the following rules are applied regarding liquidity and selection for the carbon credit futures. Note that “Current” and “Next” expiries are from the perspective of the index basket at a given date. Hence, immediately after rebalancing in November, “Current” expiry references the next calendar year and the “Next” expiry references the year after that:

- Current or Next Year December Expiry
- Minimum of \$10 Million for Average Monthly Program Trade Volume (Prior Six Month Period)

IHS Markit may consult with the IHS Markit Global Carbon Index Advisory Committee to review potential carbon credit futures for inclusion or existing carbon credit futures for exclusion dependent on changes in overall liquidity within carbon credit markets. Any decision as to the eligibility or ineligibility of a carbon credit futures contract will be published and the index rules will be updated accordingly.

Maturity of the Program

The IHS Markit Global Carbon Index includes only carbon credit futures that belong to cap-and-trade programs with recognizable stability regarding the sustainability and future existence of the program. Carbon credit futures that are part of unstable or extremely uncertain cap-and-trade programs are not eligible for the index.

IHS Markit may consult with the IHS Markit Global Carbon Index Advisory Committee to review potential carbon credit futures for inclusion or existing carbon credit futures for exclusion dependent on the viewed stability of respective carbon credit markets by the industry. Any decision as to the eligibility or ineligibility of a carbon credit futures contract will be published and the index rules will be updated accordingly.

Index Calculation

Static Data

Information used in the index calculation is sourced from offering circulars and checked against standard data providers.

Pricing Data

Carbon credit futures pricing is sourced from ICE Futures Pricing for European Union Allowance (EUA) futures and IHS Markit OPIS Pricing for California Carbon Allowance (CCA) and Regional Greenhouse Gas Initiative (RGGI) physically-settled futures contracts.

More details on the ICE Futures Pricing information used for EUA futures contracts can be found at <https://www.theice.com/products/197/EUA-Futures/specs>.

More details on the IHS Markit OPIS Pricing information used for CCA and RGGI physically-settled futures contracts can be found at <https://www.opisnet.com/about/methodology/#carbon-market-pricing>.

Rebalancing Process

The IHS Markit Global Carbon Index is rebalanced semi-annually on the last day of May and November after the close of business.

Three trading days before the end of each November ("constituent selection cut-off date"), the constituents of the index are determined and an updated membership list is published. Note that constituents only change in terms of basket composition during this rebalancing event. During the May rebalancing event, the weightings of the November basket are simply reset.

On the last day of each May and November, IHS Markit publishes the final membership with closing prices for the carbon credit futures and various analytics based on the securities.

Index Data

An index is calculated if there is at least one security available that matches all inclusion criteria. If no more securities qualify for an index, then its level will remain constant. If at least one security becomes available again, the index calculation will be resumed from the last calculated level.

Calculation occurs on a daily basis as soon as the consolidated quotes are available. Price quotes are provided and the indices are calculated every trading day in the NYSE calendar and for the last calendar days of May and November. Index calculation is based on market prices. In the event that no new quotes for a particular security are received, the index will continue to be calculated based on the last available prices. This might be the case in periods of market stress or disruption, as well as in illiquid or fragmented markets.

Note that the index converts all constituent pricing into United States dollars daily using the respective mid-rates for given currencies.

Index Weights

Once the composition of the IHS Markit Global Carbon Index has been determined, the rebalancing weight for each security is calculated. The weights and capping factors for the subsequent year are determined on the last day of each November using the average monthly USD trade volume for each constituent program for the six month lookback period prior to rebalancing. The exposure to a given region or program is limited to the following capping rules at each semi-annual rebalancing:

- Maximum Weight of 65% in Any Given Geographical Region (EMEA, Americas, APAC)
- Minimum Weight of 5% in Any Given Carbon Credit Program
- Weight of 5% for the Next Year Expiry Futures Contract for Any Given Carbon Credit Program Where the Rebalancing Weighting is 20% or Greater

Index Calculus

Rebalancing Weighting

For an index of carbon credit futures, the rebalancing weighting is the share of each constituent program's average monthly trade volume during the lookback period in relation to the aggregate average monthly trade volume during the lookback period of all index constituent programs. This volume is computed by multiplying the number of futures contracts that traded daily by their respective daily end-of-day OPIS or ICE price assessments, and any volumes that are not in USD are converted using the respective mid-

rate exchange rate as of the 4:00PM London time snap. After these weightings are calculated, the index capping rules mentioned previously are applied if needed:

$$W_{i,Rebal} = \frac{LookbackVolume_{i,Rebal}}{\sum_{i=1}^n LookbackVolume_{i,Rebal}}$$

Number of Units

During the semi-annual rebalancing event, the number of units is determined by taking the product of the total return level prior to rebalancing and the calculated rebalancing weighting for a given constituent of the index, and then dividing this figure by the respective constituent's price. Note that the number of units remains static in the index basket until the subsequent semi-annual rebalancing event, which is when said contract allocations change to match the new rebalancing composition:

$$NumberOfUnits_{i,t} = \frac{TotalReturnLevel_{Rebal} * W_{i,Rebal}}{ContractPrice_{i,Rebal}}$$

Total Return Calculation

For futures indices, there are three considerations in the total return calculation: the changes in the market prices of the underlying contracts, rolling expiring futures contracts from the existing index basket into the new index basket's contracts during rebalancing, and the yield earned on the cash collateral held for the futures. These are captured and discussed below. Note that the total return level for a given day is simply the previous calculation day's total return level times one plus the current day's total return:

$$TotalReturn_t = PriceReturn_t + CollateralYield_t$$

$$TotalReturnLevel_t = TotalReturnLevel_{t-1} * (1 + TotalReturn_t)$$

Price Return Calculation

For futures indices, the price return is determined as the daily change in the price level for the index. The price level is calculated by multiplying the daily contract pricing for each constituent by the number of units assumed to be held in the index basket. Furthermore, an adjustment is made to rescale this price level in the price return calculation after the underlying index basket has changed immediately after the rebalancing event. Note that the price return level for a given day is simply the previous calculation day's price return level times one plus the current day's price return:

$$PriceLevel_t = \sum_{i=1}^n ContractPrice_{i,t} * NumberOfUnits_{i,t}$$

$$PriceReturn_t = \frac{PriceLevel_t}{PriceLevel_{t-1}} - 1$$

$$PriceReturnLevel_t = PriceReturnLevel_{t-1} * (1 + PriceReturn_t)$$

Collateral Yield Calculation

For futures indices, the collateral yield is determined daily as the product of the prior trading day's weighted composite of overnight rates based on the currency exposure in the index and the ACT-360 day-count difference between the calculation days. Note that the Federal Funds Overnight Rate is used for USD currency exposure, the Euro Short Term Rate is used for EUR currency exposure and SONIA (Sterling Overnight Index Average) is used for GBP exposure. Furthermore, note that the weighted composite of overnight rates is determined by summing up the products of a currency's selected overnight rate times the total market weighting of all constituents sharing that given currency each day across all index currencies held:

$$\text{CollateralYield}_t = \frac{\text{DayCount}_{t-1,t}}{360} * \text{CompositeRate}_{t-1}$$
$$\text{CompositeRate}_t = \sum_{i=1}^n \text{OvernightRate}_{i,t} * \frac{\text{ContractPrice}_{i,t} * \text{NumberOfUnits}_{i,t}}{\sum_{j=1}^n \text{ContractPrice}_{j,t} * \text{NumberOfUnits}_{j,t}}$$

Weighted Carbon Price Calculation

The weighted carbon price is determined daily as the product of each constituent's share-weighting in the index and the closing value of the constituent's contract price for a given day:

$$\text{WeightedCarbonPrice}_t = \sum_{i=1}^n \text{ContractPrice}_{i,t} * \frac{\text{NumberOfUnits}_{i,t}}{\sum_{j=1}^n \text{NumberOfUnits}_{j,t}}$$

Rolling Futures

On the last day of May and November after the daily returns are calculated against the existing index basket's components and weights, the index rebalancing occurs and is reflected on the next trading day. During the November index rebalancing, the existing index basket's futures are rolled such that all maturities and vintages are extended by a year with the number of units for the new index basket calculated as described above. Daily returns computed on the first trading day of June and December are calculated against the components and weights featured in the new index basket after rebalancing.

Index History

The index history starts on July 31, 2014. The index has a base value of 100 on that date.

Settlement Conventions

The IHS Markit Global Carbon Index is calculated using the assumption of T+0 settlement days.

Foreign Exchange Rates

Foreign exchange spot rates are sourced from WM and Reuters. The index calculation uses the foreign exchange rates from 4:00PM London time. If the rebalancing day is a non-trading day, the 4:00PM London time foreign exchange rates from the previous trading day are used.

Calendar

The IHS Markit Global Carbon Index is calculated on all trading days featured in the NYSE calendar and on the last calendar day of May and November for a given year.

Data Publication and Access

The table below summarizes the publication of the IHS Markit Global Carbon Index in the *Indices* section of the IHS Markit website <http://www.markit.com/indices> for registered users and on the FTP server.

Frequency	File Type	Access
Daily	Underlying File – Security Level	FTP Server
	Indices File – Index Level	FTP Server / IHS Markit Website / Bloomberg (Index Levels Only)
Semi-Annually	End of Period Components	FTP Server / IHS Markit Website

Below are the access codes for the different vendors and IDs of the Index:

Index	Bloomberg Ticker	RIC
Total Return Index	GLCARB	.GLCARB

Governance and Regulatory Compliance

IHS Markit Benchmark Administration Limited (IMBA UK) is the Index Administrator of the IHS Markit Global Carbon indices. Information on IMBA UK's governance and compliance approach can be found [here](#). This document covers:

- Governance arrangements, including external committees
- Input data integrity
- Conflicts of interest management
- Market disruption and Force Majeure
- Methodology changes and cessations
- Complaints
- Errors and restatements
- Reporting of infringements and misconduct
- Methodology reviews
- Business continuity

More details about IMBA UK can be found on the [Administrator's website](#)

Changes to the IHS Markit Global Carbon Index

TBD	Reduction of Minimum Weight to 5% for Programs Increase rebalancing frequency from Annual to Semi-Annual
July 2, 2021	Calendar Change to NYSE
July 25, 2019	Launch of the IHS Markit Global Carbon Index

Further Information

Contractual and Content Issues

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For any general index inquiries, please contact IHS Markit indices support group at indices@ihsmarkit.com.

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Ownership

Markit Indices GmbH is a wholly-owned subsidiary of IHS Markit Limited.

Other Index Products

Markit Indices GmbH owns, manages, compiles and publishes the iTraxx credit derivative indices and the iBoxx indices.