

**S&P Dow Jones
Indices**

A Division of **S&P Global**

IHS Markit Carbon CCA Index *Index Manual*

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Table of Contents

| | |
|---|----------|
| 1) IHS Markit Carbon CCA Index Guide | 3 |
| 1.1) Publication of the Index | 3 |
| 2) Carbon Credit Selection Rules | 3 |
| 2.1) Contract Selection | 3 |
| 2.2) Maturity of the Program | 4 |
| 3) Index Calculation | 4 |
| 3.1) Pricing Data | 4 |
| 3.2) Rebalancing Process | 4 |
| 3.3) Index Data | 4 |
| 3.4) Index Weights | 5 |
| 3.5) Index Calculus | 5 |
| 3.5.1) Rebalancing Weighting | 5 |
| 3.5.2) Number of Units | 5 |
| 3.5.3) Total Return Calculation | 5 |
| 3.5.4) Price Return Calculation | 5 |
| 3.5.5) Collateral Yield Calculation | 6 |
| 3.5.6) Rolling Futures | 6 |
| 3.6) Index History | 6 |
| 3.7) Settlement Conventions | 6 |
| 3.8) Foreign Exchange Rates | 6 |
| 3.9) Calendar | 6 |
| 3.10) Data Publication and Access | 6 |
| 4) Governance and Regulatory Compliance | 7 |
| 5) Appendix A: Changes to the IHS Markit Carbon CCA Index | 7 |
| 6) Appendix B: ICE Futures Pricing Change for CCA contract | 8 |
| 7) Appendix C: Contract included in the IHS Markit Carbon CCA Index | 8 |
| 8) Further Information | 8 |
| 8.1) Contractual and Content Issues | 8 |
| 8.2) Technical Issues and Client Support | 8 |
| 8.3) Licenses and Data | 9 |
| 8.4) Ownership | 9 |
| 8.5) Other Index Products | 9 |

1) IHS Markit Carbon CCA Index Guide

The IHS Markit Carbon CCA Index is designed to measure the performance of the California Carbon Allowance credit market. Carbon credit futures are utilized to access carbon credit markets due to their liquidity and accessibility to investors.

The IHS Markit Carbon CCA Index is rebalanced once a year on the last Index Calculation Day of November (the "rebalancing date") and currently consists of California Carbon Allowance (CCA) carbon credit futures.

The IHS Markit Carbon CCA Index uses ICE Futures Pricing for CCA contracts. Prior to 22 December 2022, the IHS Markit Carbon CCA Index used Oil Price Information Service (OPIS) pricing.

This document covers the index selection rules and calculation methodology.

1.1) Publication of the Index

The index is calculated daily following the index calculation calendar below. The index is re-balanced on the last Index Calculation Day of November each year. The index is calculated on the basis of end-of-day futures exchange prices for the respective carbon credit futures on each trading day defined in the index calculation calendar. 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:

- Index Calculation Day: The Index calculates on each NYSE Trading Day.

2) Carbon Credit Selection Rules

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

- Contract Selection
- Maturity of the Program

2.1) Contract Selection

The IHS Markit Carbon CCA Index includes only Current Year California Carbon Allowance December Expiry carbon credit futures with vintage year matching the Current future's year of expiry. Note that "Current" expiry is from the perspective of the index basket at a given date. Hence, immediately after rebalancing in November, "Current" expiry references the next calendar year so for example, in December 2022, "Current" references 2023.

Please refer to [Section 7\) — Appendix C: Contract included in the IHS Markit Carbon CCA Index](#) for further information historically.

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.

2.2) Maturity of the Program

The IHS Markit Carbon CCA 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.

3) Index Calculation

3.1) Pricing Data

Carbon credit futures pricing is sourced from ICE Futures Pricing for California Carbon Allowance (CCA) physically-settled futures contracts.

More details on the ICE Futures Pricing information can be found at <https://www.theice.com/products/Futures-Options/US-Environmental/Physical-Environmental>.

More details on the Oil Pricing Information Service (OPIS) used for CCA physically-settled futures contracts prior to 22 December 2022 can be found at <https://www.opisnet.com/about/methodology/#carbon-market-pricing>.

3.2) Rebalancing Process

The IHS Markit Carbon CCA Index is rebalanced annually on the last Index Calculation Day of November after the close of business. The index rolls from the current December Expiry contract to the next one.

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

3.3) Index Data

An index level is calculated if there is at least one security available that matches all inclusion criteria. If no more securities qualify for the 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 on every Index Calculation Day. 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.

3.4) Index Weights

The rebalancing weight for the single CCA security in the index is set to 100%.

3.5) Index Calculus

3.5.1) Rebalancing Weighting

For the IHS Markit Carbon CCA Index, the rebalancing weighting is 100%, invested in the Current December Expiry contract. For the avoidance of doubt, immediately after rebalancing in November, “Current” expiry references the next calendar year.

3.5.2) Number of Units

On the rebalancing day in November, the number of units is determined by taking the product of the total return level prior to rebalancing and the calculated rebalancing weight for the 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 rebalancing event, which is when said contract allocations change to match the new rebalancing composition and weight:

$$\text{Number of Units}_{i,t} = \frac{\text{Total Return Level}_{\text{Rebal}} \times \text{Weight}_{i,\text{Rebal}}}{\text{Contract Price}_{i,\text{Rebal}}}$$

3.5.3) Total Return Calculation

There are two considerations in the total return index level calculation: the changes in the market prices of the underlying contract 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:

$$\text{Total Return}_t = \text{Price Return}_t + \text{Collateral Yield}_t$$

$$\text{Total Return Level}_t = \text{Total Return Level}_{t-1} \times (1 + \text{Total Return}_t)$$

3.5.4) Price Return Calculation

The price return is determined as the daily change in the underlying futures prices. The price level is calculated by multiplying the daily contract pricing for the 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:

$$\text{Price Level}_t = \text{Contract Price}_{i,t} \times \text{Number Of Units}_{i,t}$$

$$\text{Price Return}_t = \frac{\text{Price Level}_t}{\text{Price Level}_{t-1}} - 1$$

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

3.5.5) Collateral Yield Calculation

The yield earned on the cash collateral 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.

$$CollateralYield_t = \frac{DayCount_{t-1,t}}{360} \times CompositeRate_{t-1}$$

$$CompositeRate_t = OvernightRate_t$$

3.5.6) Rolling Futures

On the last Index Calculation Day of November after the daily returns are calculated against the existing index basket's component and weight, 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 the existing maturity and vintage is 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 December are calculated against the component and weight featured in the new index basket after rebalancing.

3.6) Index History

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

3.7) Settlement Conventions

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

3.8) Foreign Exchange Rates

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

3.9) Calendar

The IHS Markit Carbon CCA Index is calculated on all NYSE trading days.

3.10) Data Publication and Access

The table below summarizes the publication of the IHS Markit Carbon CCA Index in the Indices section of the IHS Markit website <http://www.markit.com/indices> for registered users and on the FTP server. Each Index Level published by the Index Administrator shall be rounded as defined as per below.

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

Below are the access codes for the different vendors and IDs of the Index as well as Index Currency and Rounding convention:

| Index | Bloomberg Ticker | RIC | Index Currency | Rounding (d.p.) |
|--------------------|------------------|---------|----------------|-----------------|
| Total Return Index | GLCCCA | .GLCCCA | USD | 4 |

4) Governance and Regulatory Compliance

IHS Markit Benchmark Administration Limited (IMBA UK) is the Index Administrator of the IHS Markit Carbon CCA Index. 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](#)

5) Appendix A: Changes to the IHS Markit Carbon CCA Index

| Effective Date | Change |
|------------------|--|
| 22 December 2022 | Carbon credit futures pricing is sourced from ICE Futures Pricing for the CCA physically-settled futures contract. |
| 1 December 2022 | Publication Schedule: Every month, the last publication day for the Index will be the last index Calculation Day of that month |
| 5 October 2021 | Launch of the IHS Markit Carbon CCA Index |

6) Appendix B: ICE Futures Pricing Change for CCA contract

Effective 22 December 2022, the CCA contract is being sourced from ICE. The number of units for the new ICE contract effective 22 December 2022 (date t) is calculated as per below using end of days prices as of 21 December 2022 (date $t-1$):

$$\text{NumberOfUnits}_{i,t} = \frac{\text{NumberOfUnits}_{i,t-1} \times \text{ContractPrice}_{i,t-1,OPIS}}{\text{ContractPrice}_{i,t-1,ICE}}$$

Where $\text{ContractPrice}_{i,t-1,OPIS}$ and $\text{ContractPrice}_{i,t-1,ICE}$ refer to the price of impacted futures contract sourced from OPIS and ICE respectively on 21 December 2022.

7) Appendix C: Contract included in the IHS Markit Carbon CCA Index

| Constituent | Effective Date | Contract | Source |
|-------------|------------------|-------------------------------|--------|
| CCA 1 Year | 22 December 2022 | Vintage 23 December 23 expiry | ICE |
| CCA 1 Year | 1 December 2022 | Vintage 23 December 23 expiry | OPIS |
| CCA 1 Year | 1 December 2021 | Vintage 22 December 22 expiry | OPIS |

8) Further Information

8.1) Contractual and Content Issues

For contractual or content issues please contact:

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

8.3) Licenses and Data

Markit Indices GmbH owns all IHS Markit Carbon CCA Index data, database rights, indices and all intellectual property rights therein. A license is required from Markit Indices GmbH to create and/or distribute any product that uses, is based upon, or refers to the IHS Markit Carbon CCA Index or the IHS Markit Carbon CCA Index's data.

8.4) Ownership

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

8.5) Other Index Products

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