PROSPECTUS SUPPLEMENT NO. 7

TO THE BASE PROSPECTUS DATED 19 DECEMBER 2024

GOLDMAN, SACHS & CO. WERTPAPIER GMBH
(*Incorporated with limited liability in Germany*)

as Issuer

GOLDMAN SACHS FINANCE CORP INTERNATIONAL LTD
(*Incorporated with limited liability in Jersey*)

as Issuer

GOLDMAN SACHS INTERNATIONAL
(*Incorporated with unlimited liability in England*)

as Issuer and, in respect of certain Securities only, as Guarantor

GOLDMAN SACHS BANK EUROPE SE
(*Incorporated with limited liability in German*)

as Issuer

THE GOLDMAN SACHS GROUP, INC.
(*A corporation organised under the laws of the State of Delaware*)

in respect of certain Securities only, as Guarantor

SERIES P PROGRAMME FOR THE ISSUANCE OF WARRANTS, NOTES AND CERTIFICATES

This Prospectus Supplement

This prospectus supplement (the "**Prospectus Supplement**") to the base prospectus dated 19 December 2024 prepared by Goldman, Sachs & Co. Wertpapier GmbH ("**GSW**") as issuer, Goldman Sachs Finance Corp International Ltd ("**GSFCI**") as issuer, Goldman Sachs International ("**GSI**") as issuer and as guarantor in respect of certain Securities only, Goldman Sachs Bank Europe SE ("**GSBE**") as issuer and The Goldman Sachs Group, Inc. ("**GSG**") as guarantor in respect of certain Securities only (the "Original Base Prospectus") under their Series P programme for the issuance of warrants, notes and certificates with respect to the Securities (the "**Programme**"), constitutes a supplement to the Base Prospectus for the purposes of Article 23(1) of Regulation (EU) 2017/1129 (as amended, the "**EU Prospectus Regulation**") and should be read in conjunction with Prospectus Supplement No. 1 to the Original Base Prospectus dated 17 January 2025, the Prospectus Supplement dated 23 January 2025 to the Final Terms dated 13 January 2025 (in respect of certain Securities only (ISIN: JE00BS6BFH46)) issued under the Original Base Prospectus, Prospectus Supplement No. 2 to the Original Base Prospectus dated 4 February 2025, the Prospectus Supplement dated 7 February 2025 to the Final Terms dated 13 January 2025 (in respect of certain Securities only (XS2948654541)), Prospectus Supplement No. 3 to the Original Base Prospectus dated 18 March 2025, the Prospectus Supplement dated 4 April 2025 to the Final Terms dated 17 March 2025 (in respect of certain Securities only (XS3000706633)), Prospectus Supplement No. 4 to the Original Base Prospectus dated 24 April 2025, the Prospectus Supplement dated 14 May 2025 to the Final Terms dated 17 April 2025 (in respect of certain Securities only (XS2482193435)), the Prospectus Supplement dated 22 May 2025 to the Final Terms dated 14 April 2025 (in respect of certain Securities only (XS3020976828)), Prospectus Supplement No. 5 to the Original Base Prospectus dated 23 May 2025, the Prospectus Supplement dated 3 June 2025 to the Amended and Restated Final Terms dated 22 May 2025 (in respect of certain Securities only (XS3020976828)) and Prospectus Supplement No. 6 to the Base Prospectus dated June 17, 2025 (the Original Base Prospectus as so

supplemented, the "**Base Prospectus**"). On 19 December 2024, the Base Prospectus was approved by the Commission de Surveillance du Secteur Financier (the "**CSSF**") for the purposes of Article 6 of the Luxembourg Law dated 16 July 2019 on prospectuses for securities and by the Luxembourg Stock Exchange pursuant to the rules and regulations of the Luxembourg Stock Exchange for the Luxembourg Stock Exchange's Euro MTF market.

Application has also been made to the Luxembourg Stock Exchange under part IV of the Luxembourg law dated 16 July 2019 on prospectuses for securities, to approve this Prospectus Supplement.

Terms defined in the Base Prospectus have the same meaning when used in this Prospectus Supplement unless otherwise defined herein. This Prospectus Supplement shall form part of and be read in conjunction with the Base Prospectus.

Right of withdrawal

In accordance with Article 23(2) of the EU Prospectus Regulation, investors in the European Economic Area who have already agreed to purchase or subscribe for Securities issued under the Base Prospectus before this Prospectus Supplement is published and where the Securities have not yet been delivered to them at the time when the significant new factor, material mistake or material inaccuracy to which this Prospectus Supplement relates, arose or was noted and for where any of the information in this Prospectus Supplement relates to such Securities (within the meaning of Article 23(4) of the EU Prospectus Regulation) have the right, exercisable until 1 July 2025, which is three working days after the publication of this Prospectus Supplement, to withdraw their acceptances. Investors may contact the relevant Authorised Offeror(s) (as set out in the Final Terms of the relevant Securities) should they wish to exercise such right of withdrawal.

Responsibility

Each of GSI, GSW, GSFCI, GSBE and GSG accepts responsibility for the information given in this Prospectus Supplement and confirms that, having taken all reasonable care to ensure that such is the case, the information contained in this Prospectus Supplement is, to the best of their knowledge, in accordance with the facts and does not omit anything likely to affect its import.

Purpose of this Prospectus Supplement

The purpose of this Prospectus Supplement is to (a) supplement the information in relation to Goldman Sachs' proprietary indices by including a description of a Goldman Sachs proprietary index and making certain other consequential changes, and (b) make certain changes to the information in the "*Coupon Payout Conditions*", "*Form of Final Terms (Instruments)*", and "*Form of Final Terms (Notes)*" sections of the Base Prospectus. **The amendment in relation to the terms and conditions of the security shall only apply to final terms, the date of which falls on or after the approval of this supplement.**

This Prospectus Supplement and the document(s) incorporated by reference into this Prospectus Supplement will be available on the website of the Luxembourg Stock Exchange at www.luxse.com.

Amendments and updates to certain information in the Base Prospectus

The Base Prospectus is amended and supplemented as follows:

1. Amendments to the section entitled "Risk Factors"

The information in section 5.5 entitled "*Risks associated with Proprietary Indices as Underlying Assets*" is amended and supplemented by inserting the following new sub-paragraph immediately after sub-paragraph (b) on pages 88 to 91:

"**(c)** ***Specific risks associated with the Goldman Sachs Momentum Builder® Focus ER Index including its underlying and component indices and strategies***

*Risks associated with the Goldman Sachs Momentum Builder® Focus ER Index (the "**Index**") are set out below. Terms used but not defined herein are to have the meaning given to them in the section titled "Description of the Goldman Sachs Momentum Builder® Focus ER Index".*

The Index measures the performance of the Underlying Assets on an excess return basis less the deduction rate

The Index is comprised of (i) a Base Index (which may include underlying indices (referred to as Index Components) and a hypothetical cash position (referred to as the Return-Based Money Market Position), which are together referred to as Underlying Assets in respect of the Base Index) and (ii) non-interest bearing hypothetical cash positions, as further described in in the section titled "*Description of the Goldman Sachs Momentum Builder® Focus ER Index*".

The Index measures the performance of the selected Underlying Assets in the Base Index on an excess return basis (in excess of the federal funds rate) less the deduction rate of 0.65% per annum (accruing daily), and the hypothetical cash positions earn a zero net return on an excess return basis before deducting 0.65% per annum (accruing daily). Therefore, increases in the level of the Notional Interest Rate (i.e. the federal funds rate), or increases in the Index's allocations to hypothetical cash positions, may offset in whole or in part increases in the levels or values of the Index Components, which may in turn reduce or limit any positive performance of the Index, and may have an adverse effect on the value of Securities linked to it.

An investment in Securities linked to the Index may be subject to Concentration Risk

The assets comprising each eligible Underlying Asset in the Base Index may represent a particular market or commodity sector, a particular geographic region or some other sector or asset class. As a result, an investment in Securities linked to the Index may be concentrated in a single sector or asset class even though there are maximum weights for each Underlying Asset and each Asset Class in relation to the Base Index. This concentration could occur because of concentration in the investment goals of one or more eligible Index Components. As a result of the rebalancing of the Base Index, the Index may be exposed to as few as two eligible Underlying Assets (and as few as one eligible Index Component). In addition, as a result of the Index's volatility control feature and momentum risk control adjustment mechanism, or the rebalancing of the Base Index into the Return-Based Money Market Position, the exposure of the Index at any time could be limited almost entirely to hypothetical cash positions, which earn a zero net return on an excess return basis before deducting 0.65% per annum (accruing daily).

Although any investment in Securities linked to the Index will not result in the ownership or other direct interest in the assets referenced by the eligible Index Components, the return on an investment in such Securities will be subject to certain risks similar to those associated with direct investments in the market or commodity sector, geographic region, other sector or class represented by the relevant indices or assets.

In addition, in connection with a rebalancing of the Base Index, the Index may have exposure to eligible Underlying Assets that only represent a limited number of markets or commodity sectors, geographic regions, other sectors or asset classes. If this were to occur, an investment in Securities linked to the Index will be subject to risks similar to those associated with direct investments in these markets or commodity sectors, geographic regions, other sectors or asset classes. These markets, geographic regions, sectors or asset classes may not be diversified.

Furthermore, holders of Securities linked to the Index may be subject to an additional concentration risk resulting from the Index's focus on U.S. large capitalization and technology equities. Although the weight of each of the US Large-Cap Equities (US Equity Futures Rolling Strategy Index) and US Technology Equities (US Technology Equity Futures Rolling Strategy Series Q Total Return Index) may be as low as 0% of the Base Index on an individual asset basis, their minimum combined weight must equal at least 20% of the Base Index.

The Index may have no exposure to certain eligible Underlying Assets

On any given Index Business Day, the Index may have exposure, via the Base Index, to only a limited subset of the 10 eligible Underlying Assets (which, including the hypothetical cash positions as a single asset, could be as few as two eligible Underlying Assets (as few as one eligible Index Component)). The Index therefore may have no exposure to some of the eligible Underlying Assets or eligible Asset Classes in respect of the Base Index during the entire term of a series of Securities linked to the Index, which may result in the Index performing worse during such time period than if it had a more balanced exposure to the eligible Underlying Assets and/or Asset Classes, which in turn could negatively impact the value of such Securities linked to the Index.

Furthermore, as a result of the Index's volatility control feature and momentum risk control adjustment mechanism, or a rebalancing of the Base Index into the Return Money Market Position, the exposure of the Index at any time could be limited almost entirely to hypothetical cash positions, which earn a zero net return on an excess return basis before deducting 0.65% per annum (accruing daily). This may result in the Index underperforming in comparison to an alternative index with a more diversified exposure profile, and this may negatively impact the value of any Securities linked to the Index.

The weight of each Underlying Asset in the Base Index reflects the average of the weights of such Underlying Asset over three look-back periods and over the applicable Weight Averaging Period

To calculate the weight of each underlying asset in the Base Index on each Index Business Day (in the following contexts, a rebalancing day), three hypothetical portfolios are generated for a nine-month, six-month and three-month look-back period for each day in the ten Index Business Day Weight Averaging Period related to that rebalancing day. Each hypothetical portfolio is calculated to reflect the highest historical return during each such look-back period (nine months, six months and three months), subject to a constraint on realized volatility and a minimum and maximum weight for each eligible Underlying Asset and each Asset Class in respect of the Base Index. The target weight of each Underlying Asset in the Base Index for a given day in the applicable Weight Averaging Period will equal the average of the weights of such Underlying Asset in the three hypothetical portfolios while the weight of each Underlying Asset for the daily rebalancing of the Base Index will equal the ten-day average of such target weights. As a result, the weight of each Underlying Asset in the Base Index will be different than if it had been determined based on a single look-back period, and the Index (and any Securities linked to the Index) may have performed more positively if the weight of each such Underlying Asset had been determined based on a single look-back period.

The Index may not successfully capture price momentum

The Index attempts to track the positive price momentum in the eligible Underlying Assets, both through the rebalancing of the Base Index and the momentum risk control adjustment mechanism.

As such, on each daily rebalancing day, the Base Index is rebalanced by first calculating, for each day in the applicable Weight Averaging Period related to that rebalancing day, the portfolio of eligible Underlying Assets that would have provided the highest historical return during three look-back periods (nine months, six months and three months), subject to the constraints on volatility and minimum and maximum weights for eligible Underlying Assets and Asset Classes in respect of the Base Index. However, there is no guarantee that trends existing in the preceding nine months, six months or three months over which returns and volatilities are evaluated will continue in the future. If the trend of an eligible Underlying Asset changes or reverses at the end of any measurement period, such change may not be fully reflected in the return of such eligible Underlying Asset calculated over the look-back period.

Furthermore, averaging the weights for each Underlying Assets in the Base Index across the three look-back periods, and the further averaging of such averaged target weights during the applicable Weight Averaging Period, may obscure the effects of positive price momentum that might be evident by optimizing over a single time period, and may mean that the value of the Base Index does not reflect price momentum and does not perform as well as an approach that does not average value over different

time periods. It is unlikely that the averaged target weights using the three look-back periods, or the ten-day average of averaged target weights, would optimize historical returns over any single time period, even in the absence of the other constraints described below.

Although the Index's methodology algorithm seeks to reflect positive price momentum, in part, by selecting portfolios of eligible Underlying Assets to comprise the Base Index with the highest nine-month, six-month and three-month historical returns, the minimum and maximum weights applied to the Underlying Assets, the minimum and maximum weights applied to Asset Classes and the application of a 5% volatility constraint, in each case in respect of the Base Index, may constrain the ability of the methodology algorithm to select a portfolio of eligible Underlying Assets with the highest historical returns over any of the relevant look-back periods. For example, the minimum combined weight of the US Large-Cap Equities (US Equity Futures Rolling Strategy Index) and US Technology Equities (US Technology Equity Futures Rolling Strategy Series Q Total Return Index) must account for at least 20% of the Base Index, and poor performance in large cap U.S. equities or the technology sector could adversely affect the relative performance of the Base Index (and, in turn, the performance of the Index and Securities linked thereto) if other eligible Underlying Assets are experiencing positive price momentum. Similarly, the Index may have diminished exposure to eligible Index Components that are experiencing positive price momentum if such price momentum is accompanied by increased volatility that reduces the Index's exposure to such eligible Index Components.

Furthermore, the Index is different from another index that might seek to measure long-term exposure to a fixed portfolio of underlying assets. For example, compared to a fixed portfolio of underlying assets, the Index may have diminished exposure (via the Base Index) to eligible Underlying Assets that are not well represented in the Base Index due to lower historical returns, and would not benefit from any sudden spikes in returns attributable to such assets following the periods used to determine a rebalancing of the Base Index. As a result, if market conditions do not reflect a continuation of prior observed trends, the value of the Index, which is rebalanced based on prior trends, may not perform as well as a fixed portfolio of underlying assets. No assurance can be given that the methodology used to construct the Index will outperform any alternative index that might be constructed from the eligible Underlying Assets.

Furthermore, the momentum risk control adjustment mechanism applied to the Volatility Controlled Index, which generally compares the level of the Volatility Controlled Index at the beginning and end of a 100 Index Business Day period, may fail to identify negative price trends that would be evident if the levels of the Volatility Controlled Index at other points during such 100 Index Business Day period, or a different measurement period, were taken into consideration. In addition, there is no guarantee that trends existing in the preceding 100 Index Business Days will continue in the future.

The crystallisation of any of the above risks may adversely affect the performance of the Index, which in turn could have a negative impact on the value of any Securities linked to the Index.

The Index may not successfully limit volatility

The Index seeks to limit volatility in two stages (through application of the methodology algorithm's volatility constraint in rebalancing the Base Index and the 5% volatility constraint applied to the Base Index). In both cases, however, allocations are based on backward-looking historical measures and, in the case of allocations between the Base Index and the non-interest bearing Deleverage Cash Position through application of the volatility control mechanism, exponentially weighted moving volatilities that give greater consideration to more recent volatility data. There is no assurance that the future realized volatility of the Base Index or its Underlying Assets will exhibit similar levels of volatility as they have historically, or that recent historical volatility levels are a better predictor of future volatility than would be the case using a longer historical period.

No assurance can be given that the Volatility Controlled Index will limit volatility to the Volatility Control Level (being 5%). For example, if a sudden increase in the volatility of the Underlying Assets causes the volatility of the Base Index to sharply exceed 5%, the exponentially weighted moving

volatilities (which give varying consideration to volatility measures from earlier periods) may not respond quickly enough to this sudden volatility increase and the volatility control feature may only gradually shift the Index's exposure from the Base Index to the Deleveraged Cash Position. Under such conditions, actual realized volatility of the Volatility Controlled Index may exceed 5%. On the other hand, none of the Base Index, Volatility Controlled Index or Index permits leverage (i.e., asset exposure in excess of 100%), and, as a result, the Volatility Controlled Index may not achieve a volatility as high as 5% if the underlying assets in the Base Index are experiencing low levels of volatility. As a result, the actual realized volatility of the Volatility Controlled Index may be greater or less than 5%. Furthermore, even if the Volatility Controlled Index achieves a volatility of 5%, the volatility of the Index itself may be lower due to reallocations from the Volatility Controlled Index to the non-interest bearing Momentum Risk Control Cash Position. If the Index has a high allocation to the Momentum Risk Control Cash Position for a prolonged period, the volatility of the Index may be significantly lower than 5%.

If the Index is unable to limit volatility in the manner described above, this could cause the Index to underperform, which may in turn have an adverse impact on the value of any Securities linked to the Index and a holder's return thereunder.

The maximum weight imposed on an Asset Class may prevent all of the eligible Underlying Assets in such Asset Class from being included in the Base Index at their maximum weight

The maximum weight imposed on an Asset Class with respect to the Base Index may prevent all of the eligible Underlying Assets in such Asset Class from being included in the Base Index at their maximum weights. This is due to the fact that, in many cases, the maximum weight for an Asset Class is less than the sum of the maximum weights of the eligible Underlying Assets in that Asset Class. As a result, the Base Index's exposure to its Underlying Assets may be limited by its inability to include other Underlying Assets from the same Asset Class, even if such Underlying Asset(s) would have provided higher historical returns using the index methodology and would otherwise satisfy the volatility and asset-level (but not asset class-level) maximum weight constraints. Consequently, this may have a negative impact on the performance of the Base Index, which in turn could adversely affect the value of the Index (and any Securities linked to the Index).

The Index's exposure to the performance of the Index Components may be limited by deleveraging and the weight and volatility constraints

The Index may be subject to notional deleveraging, which may limit the gains of investment linked to the Index. Deleveraging means that the increase or decrease in the level or value of an index is subject to an adjustment decreasing exposure to riskier assets (i.e., for purposes of the Index, notional exposure to the Index Components), potentially reducing increases in the value of the Index should the value of the Index Components increase.

On each daily rebalancing day, the Index's methodology sets the weights for the eligible Underlying Assets in the Base Index by averaging weights that would have provided the highest historical return during three look-back periods (nine months, six months and three months), subject to investment constraints on the minimum and maximum weights of each eligible Underlying Asset and each Asset Class and the volatility constraint of 5%. These constraints, as well as the use of the ten-day Weight Averaging Period, may result in the Index performing worse than an alternative index without such constraints, and, accordingly, Securities linked to the Index may have a lower value than if they were linked to such alternative index.

The Index's volatility control feature and momentum risk control adjustment mechanism, as well as the inclusion of the Return-Based Money Market Position as an eligible Underlying Asset of the Base Index, may result in a significant portion of the Index's exposure being allocated to hypothetical cash positions, which earn a zero net return on an excess return basis before deducting 0.65% per annum (accruing daily). As a result, holders of Securities linked to the Index may not benefit fully from increases in the value of the Index Components.

If the value of the Index changes, the market value of Securities linked to the Index may not change in the same manner

Securities linked to the Index may trade quite differently from the performance of the Index, and changes in the value of the Index may not result in a comparable change in the market value of such Securities. Even if the value of the Index increases during the term of a series of Securities linked to the Index, the market value of such Securities may not increase by a corresponding amount.

The lower performance of one Underlying Asset may offset an increase in the other Underlying Assets comprising the Base Index

The Index is exposed to the performance of the Base Index, which rebalances daily among 10 eligible Underlying Assets. Declines in the level or value of one Underlying Asset may offset increases in the levels or values of the other Underlying Assets in determining the Base Index Value. As a result, this may reduce or eliminate any positive performance of the Index, which in turn could reduce any returns payable in respect of any Securities linked to the Index.

As historical return and realized volatility are measured on an aggregate basis, the Index may have an exposure to eligible Underlying Assets with a high realized volatility and may not be exposed to eligible Underlying Assets with a high historical return

Because historical return and realized volatility are measured on an aggregate basis within each hypothetical portfolio, the Base Index may include eligible Underlying Assets with a high realized volatility and may exclude eligible Underlying Assets with a high historical return, which may adversely affect the performance of the Base Index and, consequently, the value of the Index and Securities linked to it. An eligible Underlying Asset with a relatively high realized volatility may be included in the Base Index because of its historically low or negative correlation with another eligible Underlying Asset that is also included in the Base Index. If such historical correlations were to break down, which may be more likely to occur during periods of market stress, the Index may be exposed to high levels of aggregate volatility that were not anticipated by the Index methodology, which could have a negative impact on the value of Securities linked to the Index.

In addition, highly correlated eligible Underlying Assets may be excluded from a hypothetical portfolio, in whole or in part, on a rebalancing day, even if, on an independent basis, such eligible Underlying Assets have a relatively high nine-month, six-month and three-month historical return or relatively low realized volatility for such look-back periods. The exclusion of such Underlying Assets from the Base Index may result in the Index underperforming, which in turn may adversely affect the value of Securities linked to it.

Correlation of performances among the Underlying Assets may adversely affect the performance of the Index

Performances of the Underlying Assets in the Base Index may become highly correlated from time to time, including, but not limited to, periods in which there is a substantial decline in a particular sector or asset type containing such correlated Underlying Assets or periods of general market stress. High correlation among Underlying Assets representing any one sector or asset type which has a substantial percentage weighting in the Base Index or otherwise during periods of negative returns could have an adverse effect on the value of the Base Index and, consequently, the value of the Index, which in turn may adversely affect the value of Securities linked to the Index. Furthermore, the Index's volatility control features, which take historical correlations among Underlying Assets into account in seeking to limit overall volatility, may be less effective during periods of highly correlated Underlying Asset performance, and an ineffective volatility control feature may adversely affect the performance of the Index and, therefore, the value of any Securities linked to the Index.

The Index may have a very substantial allocation to hypothetical cash positions and other potentially low-yielding assets for sustained periods

As a result of the Index's volatility control feature and momentum risk control adjustment mechanism, or rebalancing of the Base Index into the Return-Based Money Market Position, the exposure of the Index at any time could be limited almost entirely to hypothetical cash positions, which earn a zero net return on an excess return basis before deducting 0.65% per annum (accruing daily) as described under the risk factor " *The Index measures the performance of the Underlying Assets on an excess return basis less the deduction rate*" above.

In addition, there is no guarantee that the Index's ability to allocate to hypothetical cash positions will successfully reduce the volatility of the Index, limit its exposure to negative price momentum or limit exposure to risky assets in a negative return environment. Each of the intended safeguards described above rely on historical data, generally over an extended period of time, and if there is a rapid and severe decline in the level or value of the Index Components, the Index may not rebalance into hypothetical cash positions until the value of the Index has declined by a substantial amount, and such decline could have an adverse effect on the value of Securities linked to the Index.

Furthermore, the index methodology permits a high degree of exposure to developed market government bond-linked assets, which could potentially account for a significant portion (80%) of the Base Index's overall allocation. Index Components tracking developed market government bond-linked assets account for three of the Base Index's nine eligible Index Components, and each such Index Component could individually account for up to 60% of the Base Index's exposure (subject to the 80% maximum allocation to the Asset Class to which such Index Components belong). The volatility constraint is based on historical realized volatility and may result in non-money market Underlying Assets with lower historical realized volatility, such as developed market government bond indices, representing a disproportionately large share of the Base Index's exposure and, in such circumstances, the underperformance of these Underlying Assets could have a disproportionately negative effect on the performance of the Base Index, which in turn is likely to negatively impact the performance of the Index and the value of any Securities linked to the Index.

The Index's momentum risk control adjustment mechanism may not work as well as intended and may negatively affect the performance of the Index

The Index has a momentum risk control adjustment feature which aims to provide a notional performance-controlled exposure to the Volatility Controlled Index and limit the Index's exposure to negative price momentum in the Volatility Controlled Index. This is achieved by decreasing the exposure of the Index to the Volatility Controlled Index (and, in turn, the Index Components) if the Volatility Controlled Index has exhibited negative price momentum (which is deemed to occur when the Volatility Controlled Index level falls below its level on the 100th Index Business Day preceding such momentum measurement day) on one or more Index Business Day during the 21 Index Business Day period from (but excluding) the 23rd Index Business Day, to (and including) the 2nd Index Business Day, prior to a rebalancing day. A decrease in the historical performance of the Volatility Controlled Index may decrease the exposure of the Index to the Volatility Controlled Index (and, in turn, the Index Components). The future performance of the Volatility Controlled Index may differ from the historical performance of the Volatility Controlled Index and, as such, the exposure to the Volatility Controlled Index and the performance of the Index may be different if it was calculated based on the future performance rather than the historical performance of the Volatility Controlled Index. In addition, the exposure to the Volatility Controlled Index (and, in turn, the performance of the Index and Securities linked to it) may be different than it would have been had the price momentum been calculated in a different manner or by comparing Volatility Controlled Index levels across different dates. Further, due to the 21 Index Business Day momentum measurement period, the Index may be slow to reduce exposure to the Volatility Controlled Index (and, in turn, the Index Components) in reaction to a sudden increase in negative price momentum as measured by the Index. Even if every momentum measurement day in a momentum measurement period exhibits negative price momentum, the Momentum Risk Control Cash Position will never account for more than 75% of index's exposure (although the Return-Based Money Market Position and Deleverage Cash Position may increase the Index's aggregate hypothetical cash position beyond 75%). Conversely, the index may be slow to increase exposure to the Volatility Controlled Index (and, in turn, the Index Components) once the market has recovered

from previous drops in historical performance reflected in the Volatility Controlled Index. Persistent negative price momentum as measured by the momentum risk control adjustment mechanism may cause the Index to have a high allocation to the momentum risk control cash position (and thus hypothetical cash positions) and a low allocation to the Index Components for a prolonged period of time. To the extent that the Index's absolute overall exposure to the Index Components is less than 100%, the Index will have reduced exposure to any positive performance of the Index Components and may underperform as compared to an index where the exposure was not reduced by a momentum risk control adjustment mechanism, and any such underperformance of the Index would likely have a negative impact on the value of Securities linked to the Index.

Base Index allocations may be affected by the methodology algorithm

The Calculation Agent employs commercially available computer software that determines mathematical solutions to predefined mathematical problems (a "solver") which uses a pre-defined set of optimization formulae to select the weights of the Underlying Assets in the Base Index for each look-back period. If the Calculation Agent employed a different "solver," the final set of weights selected for the Underlying Assets might be different and possibly materially so. There is no guarantee that this solver will determine the optimal set of weights for the Underlying Assets in the Base Index and it is possible that there exists on any rebalancing day a permissible combination of weights for the Underlying Assets in the Base Index with a higher return over the relevant look-back periods, meaning that the Base Index, and consequently the Index and Securities linked to the Index, may perform worse than if a different "solver" was employed by the Calculation Agent.

Certain eligible Underlying Assets are subject to an internal currency hedge, which may not be effective

With respect to the eligible Underlying Assets in respect of the Base Index which are denominated in a currency other than U.S. dollars (i.e., European Equity Futures Rolling Strategy Index (FRSIEUE), the Japanese Equity Futures Rolling Strategy Index (FRSIJPE), the European Government Bond Futures Rolling Strategy Index (FRSIEUB) and the Japanese Government Bond Futures Rolling Strategy Index (FRSIJPB)), the Index reflects an internal simulated currency hedge, which, through a series of hypothetical currency hedging transactions, seeks to partially mitigate such eligible Underlying Assets' exposure to exchange rate fluctuations in such currencies. However, because the internal currency hedge does not adjust intra-day to account for changing levels of such eligible Index Components, such eligible Index Components are fully exposed to currency risks with respect to any gain or loss in their levels on each Index Business Day. Because the internal currency hedge exposures are not adjusted intra-day to reflect changes in the levels of eligible Index Components subject to the internal currency hedge and, as a result, may reflect an over-hedged (if the Index Components decline intra-day) or under-hedged (if the Index Components increase intra-day) position, on any given Index Business Day, any increases in the levels of such Index Components may be reduced by depreciation of the relevant currencies, and any decreases in the levels of the Index Components may be amplified by appreciation of the relevant currencies. As a result of such movements, the Index, and Securities linked to it, are still subject to the risk of currency fluctuations to the extent one or more non-U.S. dollar-denominated eligible Underlying Assets has a non-zero weight in the Base Index. In addition, the US-foreign currency financing amounts included as part of the internal currency hedge may increase or decrease the returns of the Index Components, depending on the values of federal funds rate, interest rates for non-U.S. currencies and currency exchange rate performance. Furthermore, as the currency hedged levels of such eligible Index Components are based on the performance of synthetic cash deposits, the internal simulated currency hedge feature is unlikely to replicate a return exactly equal or similar to the return to such eligible Index Component that would be available to an investor whose investment currency is euro or Japanese yen, as applicable. Changes in a particular currency exchange rate result from the interaction of many factors directly or indirectly affecting economic or political conditions, including rates of inflation, interest rate levels, balances of payment among countries, the extent of governmental surpluses or deficits and other financial, economic, military and political factors, among others. If the internal simulated currency hedge fails to effectively mitigate currency fluctuations, this could negatively impact the performance of the Index and, in turn, the value of any Securities linked to the Index.

The Index may perform poorly during periods characterized by increased short-term volatility

The Index's methodology is based on momentum investing. Momentum investing strategies are effective at identifying the current market direction in trending markets. However, in non-trending markets, momentum investment strategies are subject to "whipsaws." A whipsaw occurs when the market reverses and does the opposite of what is indicated by the trend indicator, resulting in a trading loss during the particular period. Consequently, the Index may perform poorly in non-trending, "choppy" markets characterized by increased short-term volatility, which in turn may adversely affect the value of Securities linked to the Index and a holder's return in respect of such Securities.

Market Disruption Events could affect the value of the Index

If a rebalancing of the Base Index or the Index must be effected on an Index Business Day on which a Market Disruption Event occurs with respect to any Underlying Asset, the Calculation Agent in respect of the Index shall then rebalance the Index (as further described in the sub-section "*Rebalancing; Impact of Disruptions*" in the section titled "*Description of the Goldman Sachs Momentum Builder® Focus ER Index*"). The occurrence of a Market Disruption Event in respect of an Index Business Day may have an adverse impact on the value of the Index and, consequently, the value of Securities linked to the Index.

The historical levels of the Notional Interest Rate are not an indication of the future performance of the Notional Interest Rate

In the past, the level of the Notional Interest Rate (i.e. the federal funds rate) has experienced significant fluctuations. Investors in Securities linked to the Index should note that historical levels, fluctuations and trends of the Notional Interest Rate are not necessarily indicative of its future levels. Any historical upward or downward trend in the Notional Interest Rate is not an indication that the Notional Interest Rate is more or less likely to increase or decrease at any time, and investors should not take the historical levels of the Notional Interest Rate as an indication of its future performance.

The policies of the Index Sponsor, Index Committee and Calculation Agent, and changes that affect the Index or the Underlying Assets, could adversely affect the market value of Securities linked to the Index

The policies of the Index Sponsor, Index Committee and Calculation Agent, in each case in respect of the Index, as applicable, concerning the calculation of the value of the Index, additions, deletions or substitutions of eligible Underlying Assets and the manner in which changes affecting the eligible Underlying Assets are reflected in the value of the Index could affect the value of the Index, which may in turn adversely affect the value of Securities linked to the Index and any amounts payable in respect of such Securities.

The index calculation agent will have authority to make determinations that could negatively affect the performance of the Index

The Index Sponsor has retained Solactive AG to serve as Calculation Agent in respect of the Index. As Calculation Agent, Solactive AG calculates the value of the Index and implements the methodology determined by the Index Committee. The Calculation Agent (in certain cases in consultation with the Index Committee) has the right, from time-to-time, to exercise discretion with respect to the Index. The exercise of such discretion by the Calculation Agent could adversely affect the performance of the Index, which in turn may negatively impact the value of Securities linked to the Index and a holder's return in respect of such Securities.

(i) ***Specific risks in respect of Index Components comprising the Base Index***

(A) ***Disruption Event in respect of futures markets – Limit Prices***

The futures markets are subject to temporary distortions or other disruptions due to various factors, including lack of liquidity in the markets and government regulation and

intervention. In addition, U.S. futures exchanges and some foreign exchanges have regulations that limit the amount of fluctuation in contract prices which may occur during a single business day. These disruptions include the cessation, for a material time, of trading in the futures contracts underlying an Index Component or the imposition by the futures exchange on which one or more such futures contracts are traded off a "limit price," a range outside of which these futures contracts are not permitted to trade. Once the limit price has been reached in a particular contract, no trades may be made at a price beyond the limit, or trading may be limited for a specified period of time. Limit prices have the effect of precluding trading in a particular contract or forcing the liquidation of contracts at potentially disadvantageous times or prices. In addition, a futures exchange may replace or delist a futures contract included in the relevant Index Component. There can be no assurance that a disruption, replacement or delisting of a futures contract, or any other event, will not have an adverse or distortive effect on the value of an Index Component or the manner in which it is calculated, and in turn, an adverse or distortive effect on the value of the Base Index and, consequently, the value of the Index or the manner in which the Base Index or the Index is calculated.

(B) ***Exposure to "rolling" and its impact on the performance of an Index Component***

Index Components which are indices trading futures contracts will, from time-to-time, shift exposure from one futures contract to another futures contract on the same underlying asset but with a different expiration (and such process is referred to as "rolling" the futures contract). As the relevant futures contract that notionally comprises an Index Component approaches expiration, it is rolled and replaced by a similar contract that has a later expiration. As a futures contract approaches expiration, its value will generally approach the spot price of its underlying asset because, by expiration, it will closely represent a contract to buy or sell such underlying asset for immediate delivery. If the market for a futures contract is in "contango," where the price of the futures contract with a later expiration date during a rolling period is higher than the spot price of its underlying asset, then the value of such futures contract would tend to decline over time (assuming the spot price and other relevant factors remain unchanged), because the higher futures price is likely to decline to converge with the lower spot price as the expiration of the futures contract approaches. This negative effect on the futures price is referred to as a negative "carry" or "roll yield" and is realised over the term of such contract. A negative roll yield will adversely affect the level or value of the Index Component over time and, therefore, the value of the Base Index and, consequently, the value of the Index. Negative roll yields may also cause the level or value of the relevant Index Component to decrease significantly over time even when the level or value of the applicable underlying asset is stable or increasing.

(C) ***Futures contracts referenced by an Index Component may be linked to underlying Reference Equity Indices comprising the common stock of Goldman Sachs Group, Inc. ("GS Group")***

The common stock of the GS Group is one of the index stocks comprising the S&P 500® Index and other reference equity indices (each, a "**Reference Equity Index**") referenced by futures contracts notionally comprising the Index Components. Currently or from time to time in the future, the GS Group may own securities of or engage in business with the issuers of securities comprising a Reference Equity Index that is the subject of a futures contract notionally comprising one or more of the Index Components. Unless otherwise disclosed in the applicable pricing supplement, the GS Group are not otherwise affiliated with the issuers of securities comprising a Reference Equity Index or the sponsor of a Reference Equity Index. None of the GS Group have participated in the preparation of any publicly available information or made any "due diligence" investigation or inquiry with respect to any such Reference Equity Index or the issuers of securities comprising any such Reference Equity Index. Any investor in Securities

linked to the Index should make independent investigation into such Reference Equity Indices and the issuers of the securities comprising such Reference Equity Indices.

None of the issuers of any securities comprising a Reference Equity Index are involved in the offering of Securities linked to the Index in any way and none of them have any obligation of any sort with respect to such Securities. Thus, none of the issuers of securities comprising a Reference Equity Index have any obligation to take the interests of an investor in Securities linked to the Index into consideration for any reason, including in taking any corporate actions that might adversely affect the level or value of such a Reference Equity Index and, in turn, the price of the relevant futures contract and/or the level or value of the relevant Index Component which may subsequently adversely impact the value of the Base Index and, consequently, the value of the Index, or making any investment decision for such Reference Equity Index.

(D) ***Published foreign exchange rates may be subject to manipulation***

Regulators in various countries are in the process of investigating the potential manipulation of published foreign exchange rates. If such manipulation has occurred or is continuing, certain published foreign exchange rates may have been, or may be in the future, artificially lower (or higher) than they would otherwise have been. Any such manipulation could have an adverse impact on any payments on, and the value of (i) Securities linked to the Index and the trading market for such Securities and (ii) any underlying assets notionally comprising the Index Components. In addition, it is impossible to predict whether any changes or reforms affecting the determination or publication of foreign exchange rates or the supervision of currency trading generally will be implemented in connection with these investigations. Any such changes or reforms could also adversely impact the value of the Index and any Securities linked to the Index.

(E) ***Index Components may rely on foreign exchange markets***

Certain Index Components are comprised of underlying assets that are denominated or trade in currencies other than the currency in which the Index is calculated that are adjusted to reflect their value in the currency in which the Index is calculated. The interbank market in foreign currencies is a global around-the-clock market. Therefore, the hours of trading for Securities linked to the Index, if any trading market develops, may not conform to the hours during which the relevant currencies trade. Significant price and rate movements may take place in the underlying foreign exchange markets that may not be reflected immediately in the price of Securities linked to the Index. Investors should take the possibility of these movements into account before making any investment in Securities linked to the Index as such movements may also impact the level or value of the Index Components, the value of the Base Index and, consequently, the value of the Index and any Securities linked to the Index (potentially materially so).

(F) ***The Index Components may notionally invest in foreign assets and are therefore subject to additional risks in respect of foreign securities markets***

Certain Reference Equity Indices are notionally comprised of underlying assets issued by foreign companies or entities. Investments in foreign securities markets involve additional risks. Any foreign securities market, and in particular emerging markets, in which underlying assets comprising the Reference Equity Indices trade may be less liquid, more volatile and affected by global or domestic market developments in a different way than the U.S. securities market or other foreign securities markets are. Both government intervention in a foreign securities market, either directly or indirectly, and cross-shareholdings in foreign companies may affect trading prices and volumes in that market. There is also generally less publicly available information about foreign

companies than about those U.S. companies that are subject to the reporting requirements of the U.S. Securities and Exchange Commission. Further, foreign companies are subject to accounting, auditing and financial reporting standards and requirements that differ from those applicable to U.S. reporting companies.

The prices of securities in a foreign country are subject to political, economic, financial and social factors that are unique to such foreign country's geographical region. These factors include: recent changes, or the possibility of future changes, in the applicable foreign government's economic and fiscal policies; the possible implementation of, or changes in, currency exchange laws or other laws or restrictions applicable to foreign companies or investments in foreign equity securities; fluctuations, or the possibility of fluctuations, in currency exchange rates; and the possibility of outbreaks of hostility, political instability, natural disaster or adverse public health developments. These factors could negatively affect such foreign securities market and the price of securities therein. Further, geographical regions may react to global factors in different ways which may cause the prices of securities in a foreign securities market to fluctuate in a way that differs from those of securities in the U.S. securities market or other foreign securities markets. Foreign economies may also differ from the U.S. economy in important respects, including growth of gross national product, rate of inflation, capital reinvestment, resources and self-sufficiency, which may have a positive or negative effect on foreign securities prices.

The Reference Equity Indices may be comprised of underlying assets that trade in countries considered to be emerging markets. Countries with emerging markets may have relatively less stable governments, may present the risks of nationalisation of businesses, restrictions on foreign ownership and prohibitions on the repatriation of assets, and may have less protection of property rights than more developed countries. The economies of countries with emerging markets may be based on only a few industries, may be highly vulnerable to changes in local or global trade conditions, and may suffer from extreme and volatile debt burdens or inflation rates. Local securities markets may trade a small number of securities and may be unable to respond effectively to increases in trading volume, potentially making prompt liquidation of holdings difficult or impossible at times. It will also likely be more costly and difficult for the sponsor of a reference equity index to enforce the laws or regulations of a foreign country or trading facility, and it is possible that the foreign country or trading facility may not have laws or regulations which adequately protect the rights and interests of investors in the assets included in such Reference Equity Indices.

The composition of a Reference Equity Index may also be materially changed following government regulatory action, including legislative acts and executive orders including prohibitions relating to the sale and purchase of certain securities, which could in turn materially adversely affect the level or value of the Index Components and, consequently, the value of the Base Index and, subsequently, the Index. Such prohibitions could result in the underlying securities being removed from a Reference Equity Index, and such removal could have a material and negative effect on the level of the Reference Equity Index and, subsequently, the level or value of the Index Components, which may in turn impact the value of the Base Index and, consequently, the Index. Similarly, if the underlying assets comprising a Reference Equity Index are subject to such government regulatory action and are not removed from a Reference Equity Index, the value of the Index could subsequently be materially and negatively affected and transactions in, or holdings of, Securities linked to the Index may also become prohibited, meaning any failure to remove such underlying assets comprising a Reference Equity Index from a Reference Equity Index could result in the loss of a significant portion or all of an investor’s investment in Securities linked to the Index.

(G) ***Certain Index Components are subject to the creditworthiness of the issuers of debt securities***

Certain Index Components are notionally comprised of futures contracts referencing underlying debt securities. Generally, the prices of debt securities are influenced by the creditworthiness of the issuers of those debt securities. The credit ratings of investment grade debt securities in particular may be downgraded to non-investment grade levels, which could lead to a significant decrease in the value of those debt securities and a lack of liquidity in the trading markets for those debt securities. If that occurs, the level or value of the relevant Index Components (and, in turn, the Base Index and, subsequently, the Index and the value of Securities linked to the Index) may be adversely affected (potentially materially so).

(H) ***The sponsor of a Reference Equity Index has discretion over determinations in respect of such Reference Equity Index***

The sponsors of any Reference Equity Indices referenced by any futures contracts notionally comprising an Index Component may have the right, from time to time, to exercise discretion in respect of the composition of, and any determinations in respect of, the relevant Reference Equity Index. The sponsor of any Reference Equity Index is responsible for the composition, calculation and maintenance of such Reference Equity Index. Sponsors of Reference Equity Indices have no obligation to exercise any such discretion with regard to the interests of the Index Sponsor or any investors in Securities linked to the Index and it is difficult to predict how and to what extent any sponsor of a Reference Equity Index may exercise such discretion. Accordingly, any exercise of discretion by a sponsor of a Reference Equity Index may materially and adversely affect the level of such Reference Equity Index and, in turn, the value of any relevant Index Components, the value of the Base Index, the value of the Index and the value of Securities linked to the Index.

(I) ***Ongoing regulatory investigations and private claims could affect commodity prices***

Certain Index Components are notionally comprised of futures contracts referencing underlying commodities. An increased focus on price setting and trading prices by regulators and exchanges recently have resulted in a number of changes to the ways in which prices are determined, including prices for commodities. This increased focus also resulted in the publication of standards for benchmark setting by the International Organisation of Securities Commissions. Investigations by regulatory authorities, enforcement actions and criminal proceedings in the United States and around the world, and private litigation regarding potential direct and indirect manipulation of the trading prices of certain commodities, are ongoing against a number of firms.

These ongoing investigations, actions, proceedings and litigations may result in further review by exchanges and regulators of the methods by which commodities prices are determined and the manner in which commodities are traded and changes to those methods. In addition, changes to other commodity-related activities, such as storage facilities and delivery methods, may also occur. If any of these changes occur, the price of the futures contracts on commodities notionally comprising an Index Component may be affected, which may thereby adversely affect the value of the Index and the value of Securities linked to the Index (potentially materially so).

In addition, if alleged trading price manipulation or other alleged conduct that may have artificially affected prices has occurred or is continuing, certain published commodity prices (including historical prices) may have been, or may be in the future, artificially lower (or higher) than they would otherwise have been. In particular, the historical trading information of futures contracts on relevant commodities may be incorrect and,

as a result, may not be representative of the prices, changes in prices or the volatility of the futures contracts of such commodity. In the future, any such artificially lower (or higher) prices could have an adverse impact on the relevant futures contracts and, consequently, any payments on, and the value of, Securities linked to the Index and the trading market for any Securities linked to the Index (potentially materially so).

(J) ***Large scale purchases or sales of an Index Component by market participants may adversely affect the value of the Index***

Investors, institutions, governments and other market participants may purchase and sell exposure to certain Index Components as a hedge against inflation, market turmoil or uncertainty, or political events. Under such circumstances, significant large-scale purchases or sales of exposure to an Index Component by market participants may affect the level or value of such Index Components, which could adversely affect the value of the Base Index and, consequently, the value of the Index. If economic, political, or social conditions or pressures require or motivate public sector entities to sell exposure to an Index Component, in a coordinated or uncoordinated manner, the resulting sales could cause the level or value of such Index Component to decrease substantially, which could adversely affect the value of the Base Index and, subsequently, the value of Securities linked to the Index (potentially materially so).

2. Amendments to the section entitled "Coupon Payout Conditions"

The information in the section entitled "*Coupon Payout Conditions*" is amended and supplemented by adding this sub-paragraph (iii) to the definition of "Fixed Coupon Payment Date" in Coupon Payout Condition 2.1 (*Definitions*) on pages 437 to 438 of the Base Prospectus:

"(iii) "**Coupon Payment Date Business Day Adjustment**" to be applicable in respect of any Fixed Coupon Payment Date corresponding to a Coupon Reference Date, in which case, such Fixed Coupon Payment Date shall be, in respect of such Coupon Reference Date, such date as is specified in the relevant Issue Terms corresponding to such Coupon Observation Date or the date specified in the relevant Issue Terms to be a Fixed Coupon Payment Date scheduled to fall immediately after the date on which such Coupon Reference Date is scheduled to fall (each, a "**Scheduled Fixed Coupon Payment Date**"), in each case, subject to adjustment in accordance with the Business Day Convention specified as the "Fixed Coupon Payment Date Business Day Convention" in the relevant Issue Terms."

3. Amendments to the section entitled "Form of Final Terms (Instruments)"

3.1 The information in the section entitled "*Form of Final Terms (Instruments)*" is amended and supplemented by inserting the following new sub-paragraph immediately after sub-paragraph 27(iii)(b) of paragraph 27 (*Alternative Fixed Coupon Amount (Coupon Payout Condition 1.1)*) on page 847 of the Base Prospectus (and all subsequent sub-paragraphs shall be re-numbered accordingly):

(c)	Fixed Coupon Payment Date Business Day Adjustment:	[Applicable in respect of [the Fixed Coupon Payment Date[s] scheduled to fall on [●] (*specify dates*)] / [each Fixed Coupon Payment Date other than the Maturity Date] [each Fixed Coupon Payment Date set forth in the Fixed Coupon Table in respect of which the column "Adjusted as a Fixed Coupon Payment Date" is specified to be applicable]] [Not Applicable]. (*If Not Applicable, delete the remaining sub-paragraph of this paragraph*)

–	Fixed Coupon Payment Date Business Day Convention:	[Following Business Day Convention/ Modified Following Business Day Convention/Modified Business Day Convention/Nearest/Preceding Business Day Convention/Floating Rate Convention/ No Adjustment] [In respect of each Fixed Coupon Payment Date set forth in the Fixed Coupon Table, as specified in the column "Fixed Coupon Payment Date Business Day Convention" in the row corresponding to such Fixed Coupon Payment Date].

3.2 The information in the section entitled "*Form of Final Terms (Instruments)*" is amended and supplemented by inserting the following new sub-paragraph immediately after sub-paragraph 28(ii)(b) of paragraph 28 (*Lock-In Coupon Amount (Coupon Payout Condition 1.1(f))*) on page 848 of the Base Prospectus (and all subsequent sub-paragraphs shall be re-numbered accordingly):

(c)	Fixed Coupon Payment Date Business Day Adjustment:	[Applicable in respect of [the Fixed Coupon Payment Date[s] scheduled to fall on [●] (*specify dates*)] / [each Fixed Coupon Payment Date other than the Maturity Date] [each Fixed Coupon Payment Date set forth in the Fixed Coupon Table in respect of which the column "Adjusted as a Fixed Coupon Payment Date" is specified to be applicable]] [Not Applicable]. (*If Not Applicable, delete the remaining sub-paragraph of this paragraph*)
–	Fixed Coupon Payment Date Business Day Convention:	[Following Business Day Convention/ Modified Following Business Day Convention/Modified Business Day Convention/Nearest/Preceding Business Day Convention/Floating Rate Convention/ No Adjustment] [In respect of each Fixed Coupon Payment Date set forth in the Fixed Coupon Table, as specified in the column "Fixed Coupon Payment Date Business Day Convention" in the row corresponding to such Fixed Coupon Payment Date].

3.3 The information in the section entitled "*Form of Final Terms (Instruments)*" is amended and supplemented by deleting the "Fixed Coupon Table" immediately after paragraph 28 (*Lock-In Coupon Amount (Coupon Payout Condition 1.1(f))*) on page 848 of the Base Prospectus in its entirety and replacing it with the following table:

Fixed Coupon Table				
[Coupon Reference Date]	**[Fixed Coupon Payment Date]**	**[Coupon Value]**	**[Adjusted as a Fixed Coupon Payment Date]**	**[Fixed Coupon Payment Date Business Day Convention]**
[●]	[●]	[●]	[●]	[Following Business Day

				Convention /Modified Following Business Day Convention / Modified Business Day Convention / Nearest/Preceding Business Day Convention / Floating Rate Convention / No Adjustment]

4. Amendments to the section entitled "Form of Final Terms (Notes)"

4.1 The information in the section entitled "*Form of Final Terms (Notes)*" is amended and supplemented by inserting the following new sub-paragraph immediately after sub-paragraph 28(iii)(b) of paragraph 28 (*Alternative Fixed Coupon Amount (Coupon Payout Condition 1.1(e))*) on page 1018 of the Base Prospectus (and all subsequent sub-paragraphs shall be re-numbered accordingly):

(c)	Fixed Coupon Payment Date Business Day Adjustment:	[Applicable in respect of [the Fixed Coupon Payment Date[s] scheduled to fall on [●] (*specify dates*)] / [each Fixed Coupon Payment Date other than the Maturity Date] [each Fixed Coupon Payment Date set forth in the Fixed Coupon Table in respect of which the column "Adjusted as a Fixed Coupon Payment Date" is specified to be applicable]] [Not Applicable]. (*If Not Applicable, delete the remaining sub-paragraph of this paragraph*)
−	Fixed Coupon Payment Date Business Day Convention:	[Following Business Day Convention/ Modified Following Business Day Convention/Modified Business Day Convention/Nearest/Preceding Business Day Convention/Floating Rate Convention/ No Adjustment] [In respect of each Fixed Coupon Payment Date set forth in the Fixed Coupon Table, as specified in the column "Fixed Coupon Payment Date Business Day Convention" in the row corresponding to such Fixed Coupon Payment Date].

4.2 The information in the section entitled "*Form of Final Terms (Notes)*" is amended and supplemented by inserting the following new sub-paragraph immediately after sub-paragraph 29(ii)(b) of paragraph 29 (*Lock-In Coupon Amount (Coupon Payout Condition 1.1(f))*) on page 1019 of the Base Prospectus (and all subsequent sub-paragraphs shall be re-numbered accordingly):

(c)	Fixed Coupon Payment Date Business Day Adjustment:	[Applicable in respect of [the Fixed Coupon Payment Date[s] scheduled to fall on [●] (*specify dates*)] / [each Fixed Coupon Payment Date other than the

		Maturity Date] [each Fixed Coupon Payment Date set forth in the Fixed Coupon Table in respect of which the column "Adjusted as a Fixed Coupon Payment Date" is specified to be applicable]] [Not Applicable]. (*If Not Applicable, delete the remaining sub-paragraph of this paragraph*)
–	Fixed Coupon Payment Date Business Day Convention:	[Following Business Day Convention/ Modified Following Business Day Convention/Modified Business Day Convention/Nearest/Preceding Business Day Convention/Floating Rate Convention/ No Adjustment] [In respect of each Fixed Coupon Payment Date set forth in the Fixed Coupon Table, as specified in the column "Fixed Coupon Payment Date Business Day Convention" in the row corresponding to such Fixed Coupon Payment Date].

4.3 The information in the section entitled "*Form of Final Terms (Notes)*" is amended and supplemented by deleting the "Fixed Coupon Table" immediately after paragraph 29 (*Lock-In Coupon Amount (Coupon Payout Condition 1.1(f))*) on page 1019 of the Base Prospectus in its entirety and replacing it with the following table:

Fixed Coupon Table

[Coupon Reference Date]	**[Fixed Coupon Payment Date]**	**[Coupon Value]**	**[Adjusted as a Fixed Coupon Payment Date]**	**[Fixed Coupon Payment Date Business Day Convention]**
[●]	[●]	[●]	[●]	[Following Business Day Convention /Modified Following Business Day Convention / Modified Business Day Convention / Nearest/Preceding Business Day Convention / Floating Rate Convention / No Adjustment]

5. Inclusion of a new section

The Base Prospectus is further amended and supplemented by inserting a new section immediately after the section entitled "*FORM OF PRICING SUPPLEMENT (NOTES)*" which is set out on pages 1163 to 1178 of the Base Prospectus:

"**DESCRIPTION OF THE GOLDMAN SACHS MOMENTUM BUILDER® FOCUS ER INDEX**

Overview

*The following overview of the Goldman Sachs Momentum Builder® Focus ER Index is a summary and, as such, is necessarily incomplete. This overview should be read in conjunction with, and is qualified in its entirety by, the more detailed description of the Goldman Sachs Momentum Builder® Focus ER Index and its operations described in the sections below (such operations, including the related algorithm, the "**Methodology**", and such algorithm, the "**Methodology algorithm**"). Capitalized terms used but not defined in the overview have the meanings given to such terms in the more detailed description that follows.*

The Goldman Sachs Momentum Builder® Focus ER Index (the "**Index**") represents a notional investment in the components of various indices and hypothetical cash positions (the "**Cash Position Components**"), subject to various deductions described below. The Index is comprised of a Base Index (which may include a hypothetical cash position referred to as the "**Return-Based Money Market Position**") and non-interest bearing hypothetical cash positions. The Base Index potentially provides exposure to the following asset classes:

- *Focused U.S. Equities*, through two indices respectively comprised of futures contracts on U.S. large-cap equities and U.S. technology equities;
- *Other Developed Market Equities*, through two indices respectively comprised of futures contracts on European and Japanese equities;
- *Developed Market Fixed Income*, through three indices respectively comprised of futures contracts on U.S. Treasuries, German Government Bonds and Japanese Government Bonds;
- *Emerging Market Equities*, through an index comprised of futures contracts on emerging market equities;
- *Commodities*, through an index comprised of futures contracts on gold; and
- *Cash Equivalent*, through a Return-Based Money Market Position.

Each such asset class is referred to herein as an "**Asset Class**", each component of an Asset Class (whether an index or the Return-Based Money Market Position) is referred to herein as an "**Underlying Asset**", and each Underlying Asset other than the Return-Based Money Market Position is referred to herein as an "**Index Component**". The Underlying Assets are specified under "OVERVIEW OF THE UNDERLYING ASSETS" in Section 11 (*Annex*).

On each Index Business Day, for each look-back period of three (3), six (6) and nine (9) months, the Methodology algorithm seeks to identify the combination of Underlying Asset Target Weights (including a Return-Based Money Market Position) that would have provided the highest historical returns to the Base Index, subject to a 5% volatility constraint applied to the Base Index (which may be relaxed under certain circumstances as described in Section 1.3.1 (*Calculation of the Underlying Asset Target Weights*) below and constraints on the maximum and minimum weights of each Underlying Asset and Asset Class set forth in Section 11 (*Annex*). For each Underlying Asset, the Underlying Asset Target Weights identified by the Methodology algorithm for each of the three look-back periods are averaged to provide an Averaged Underlying Asset Target Weight as described in Section 1.3.3 (*Calculation of the Averaged Underlying Asset Target Weights*) below. Finally, the Averaged Underlying Asset Target Weights are averaged over the most recent ten Index Business Days, as further described in Section 1.3.2 (*Calculation of the Underlying Asset Weights*) below (the "**Weight Averaging Period**"), to determine the Underlying Asset Weight of each Underlying Asset in the Base Index. The Base Index includes a Return-Based Money Market Position, which may comprise a significant portion of the Base Index in certain market environments (for example, a negative return environment). The Base Index is calculated on an excess return basis, reflecting a deduction of the return that could be earned on a notional cash deposit at the "**Notional Interest Rate**" (which is the federal funds rate, determined as specified in Section 11 (*Annex*)).

The Index may be rebalanced from the Base Index into a non-interest bearing hypothetical cash position (the "**Deleverage Cash Position**") (for the avoidance of doubt, such rebalancing from the Base Index into the Deleverage Cash Position is separate from any allocation to the Return-Based Money Market Position as an Underlying Asset comprising part of the Base Index) as a result of a volatility control feature applied to the Base Index (as described in Section 2.4 (*Calculation of the Volatility Control Exposure*) and related sections below) (the index resulting from application of the volatility control feature, the "**Volatility Controlled Index**"). The volatility control feature at the Volatility Controlled Index level ratably reduces exposure to the Base Index and rebalances into a non-interest bearing Deleverage Cash Position to the extent that the volatility measure of the

Base Index exceeds 5% (the volatility measure of the Base Index is based on the higher of two exponentially weighted realized volatilities of the Base Index using (i) a short-term "decay factor" of 0.94 giving relatively greater weight to more recent volatilities and (ii) a long-term "decay factor" of 0.97 giving relatively greater weight to older volatilities).

The Index may be rebalanced from the Volatility Controlled Index into another non-interest bearing hypothetical cash position (the "**Momentum Risk Control Cash Position**") as a result of a momentum risk control adjustment feature that seeks to decrease exposure to the Volatility Controlled Index to the extent that the Volatility Controlled Index has demonstrated negative price momentum over a period of 100 Index Business Days (as described in Section 2.2 (*Calculation of the Momentum Risk Control Exposure*) and related sections below). The momentum risk control adjustment feature may further reduce exposure to the Volatility Controlled Index (and consequently, the Base Index) based on the number of days over the preceding 21 Index Business Days (the "**Momentum Risk Control Exposure Averaging Period**") that the Volatility Controlled Index has demonstrated negative price momentum compared to its level from 100 Index Business Days earlier (i.e., for each of the 21 Index Business Days, by comparing the level of the Volatility Controlled Index on such Index Business Day to its level 100 Index Business Days earlier), as described in more detail below.

Any portion of the Index not allocated to the Base Index will be allocated to the Deleverage Cash Position or the Momentum Risk Control Cash Position (together, the "**Non-Interest Bearing Cash Positions**"), or both.

The value of the Index (the "**Index Value**") is calculated on each Index Business Day in U.S. dollars. The Base Index is calculated on an excess return basis, reflecting a deduction of the return that could be earned on a notional cash deposit at the Notional Interest Rate. The returns of the Volatility Controlled Index (composed of the Base Index and the Deleverage Cash Position) reflect the weighted sum of (i) the excess returns of the Base Index as described above and (ii) a zero return attributable to the non-interest bearing Deleverage Cash Position, further reduced in each case by a deduction rate of 0.65% per annum (accruing daily), where the relative weights attributable to the Base Index and the Deleverage Cash Position (if any) are determined based on the application of the 5% volatility control. The returns of the Index are based on the weighted sum of (i) the returns of the Volatility Controlled Index and (ii) a zero return attributable to the non-interest bearing Momentum Risk Control Cash Position, as further reduced by a deduction rate of 0.65% per annum (accruing daily) applied to the weight of the Momentum Risk Control Cash Position, where the relative weights attributable to the Volatility Controlled Index and the Momentum Risk Control Cash Position (if any) are determined based on the application of the momentum risk control adjustment mechanism. As a result, any portion of the Index attributable to a Return-Based Money Market Position, a Deleverage Cash Position or a Momentum Risk Control Cash Position will effectively have a zero net return on an excess return basis before deducting 0.65% per annum (accruing daily). Any interest accrued on the Return-Based Money Market Position is deemed to be reinvested on a daily basis in such Return-Based Money Market Position. See Section 2.1 (*Calculation of the Index Value*) and related sections below for additional details.

Goldman Sachs & Co. LLC (the "**Index Sponsor**") has retained Solactive AG to serve as Calculation Agent for the Index. In the event the Index Sponsor appoints a replacement Calculation Agent, a public announcement will be made via press release. The Index Sponsor does not have any obligation to ensure that the relevant Calculation Agent continues to publish, and the Index Sponsor may discontinue publication of, the value of the Index at any time at the sole discretion of the Index Committee. The Index Sponsor may at any time appoint one or more replacement Calculation Agents including itself or an affiliate.

Unless otherwise indicated, any public announcement contemplated by this Methodology shall be made on the website of the Calculation Agent.

The Methodology

Overview

At any given time, the Base Index tracks the weighted excess return of the Underlying Assets over the return that could be earned on a notional cash deposit at the Notional Interest Rate. The respective weights of the Underlying Assets, which can be as low as zero (although US Large-Cap Equities and US Technology Equities must have a minimum combined weight of 20%), are rebalanced daily on each Index Business Day within a set of pre-determined investment and volatility constraints by applying the Methodology algorithm. On any Index Business Day, the Index may be rebalanced (i) from the Base Index into a non-interest bearing Deleverage Cash Position as a result of a volatility control feature applied to the Base Index (as described in Section 2.4 (*Calculation of the*

Volatility Control Exposure) and related sections below) and (ii) from the Volatility Controlled Index into another non-interest bearing Momentum Risk Control Cash Position as a result of a momentum risk control adjustment feature that seeks to decrease exposure to the Volatility Controlled Index to the extent that the Volatility Controlled Index has demonstrated negative price momentum over a period of 100 Index Business Days (as described in Section 2.2 (*Calculation of the Momentum Risk Control Exposure*) and related sections below). Rebalancings during Market Disruption Events are described under "*Rebalancing; Impact of Disruptions*" in Section 1.3.5 (*Calculation of the Annualized Assets Combination Realized Volatility*) below. In addition, the Index Committee intends to review the Methodology at least once a year, and may make changes to the Methodology from time to time (including after any such annual review) if it determines, in its sole discretion, that such changes are necessary or desirable in light of the goals of the Index. Any such changes to the Methodology will be publicly announced at least 60 New York business days prior to their effective date. Notwithstanding anything in this Methodology to the contrary, the Index Committee may discontinue publication of the Index at any time in its sole discretion.

Base Index Rebalancing

On each Index Business Day, the Calculation Agent, pursuant to the Methodology and subject to the applicable constraints, seeks to select the combination of permitted Underlying Asset weights that would have given the Base Index the highest historical total return (as described in Section 1.3.1 (*Calculation of the Underlying Asset Target Weights*) below). The Base Index will then be reweighted on such Index Business Day from the previous Underlying Asset Weights to the newly determined Underlying Asset Weights. The Underlying Asset Weight for each Underlying Asset in respect of an Index Business Day will be determined by taking the average of such Underlying Asset's Underlying Asset Target Weights over the Weight Averaging Period over the three look-back windows (determined as described in Section 1.3.2 (*Calculation of the Underlying Asset Weights*) and Section 1.3.3 (*Calculation of the Averaged Underlying Asset Target Weights*) below).

Volatility Control Feature

The Methodology has a volatility control feature applied on any Index Business Day. This has the effect of reducing the exposure of the Index to the performance of the Base Index (and consequently the Underlying Assets) by rebalancing a portion of the Base Index into a non-interest bearing hypothetical Deleverage Cash Position to the extent that the realized volatility of the Base Index exceeds the Volatility Control Level of 5%. The volatility control feature is in addition to the volatility constraint of the Methodology algorithm.

Momentum Risk Control Adjustment Mechanism

The Methodology includes a momentum risk control adjustment feature applied to the Volatility Controlled Index on any Index Business Day. This has the effect of reducing the exposure of the Index to the performance of the Volatility Controlled Index (and consequently further reducing the exposure of the Index to the Base Index and the Underlying Assets) by rebalancing a portion of the Volatility Controlled Index into a non-interest bearing hypothetical Momentum Risk Control Cash Position based on the Momentum Risk Control Exposure (as further described in Section 2.1 (*Calculation of the Index Value*) below). The Momentum Risk Control Exposure is a weighted percentage of the number of Index Business Days over a period of 21 Index Business Days during which the Volatility Controlled Index Level equals or exceeds the Volatility Controlled Index Level on the 100th Index Business Day preceding such Index Business Day, with a value of 1 assigned to Index Business Days for which the condition is satisfied and a value of 0.25 assigned to Index Business Days for which the condition is not satisfied (determined as described in more detail in Section 2.2 (*Calculation of the Momentum Risk Control Exposure*) below).

Excess Returns and Deduction Rate

The Index Value is calculated on each Index Business Day in U.S. dollars. The Base Index is calculated on an excess return basis, reflecting a deduction of the return that could be earned on a notional cash deposit at the Notional Interest Rate. The Notional Interest Rate will be reset daily on each Index Business Day starting from and including the Base Index Base Date (as specified in Section 11 (*Annex*)). The returns of the Volatility Controlled Index (composed of the Base Index and the Deleverage Cash Position) reflect the weighted sum of (i) the excess returns of the Base Index as described above and (ii) a zero return attributable to the non-interest bearing

Deleverage Cash Position, further reduced in each case by a deduction rate of 0.65% per annum (accruing daily), where the relative weights attributable to the Base Index and the Deleverage Cash Position (if any) are determined based on the application of the 5% volatility control. The returns of the Index are based on the weighted sum of (i) the returns of the Volatility Controlled Index and (ii) a zero return attributable to the non-interest bearing Momentum Risk Control Cash Position, as further reduced by a deduction rate of 0.65% per annum (accruing daily) applied to the weight of the Momentum Risk Control Cash Position, where the relative weights attributable to the Volatility Controlled Index and the Momentum Risk Control Cash Position (if any) are determined based on the application of the momentum risk control adjustment mechanism. As a result, any portion of the Index attributable to a Return-Based Money Market Position, a Deleverage Cash Position or a Momentum Risk Control Cash Position will effectively have a zero net return on an excess return basis before deducting 0.65% per annum (accruing daily). Any interest accrued on the Return-Based Money Market Position is deemed to be reinvested on a daily basis in such Return-Based Money Market Position. See Section 2.1 (*Calculation of the Index Value*) and related sections below for additional details.

Publication of the Index

Solactive AG (the "**Calculation Agent**") calculates and publishes the value of the Index on each Index Business Day and publishes it on both Bloomberg and Reuters. The relevant tickers are specified in the Annex. The Index Sponsor does not have any obligation to ensure that the relevant Calculation Agent continues to publish, and the Index Sponsor may discontinue publication of, the value of the Index at any time at the sole discretion of the Index Committee. The Index Sponsor may at any time appoint one or more replacement Calculation Agents including itself or an affiliate.

Publication of Changes to the Index and to the Methodology

Changes to the components of the Index made by the Index Committee will be publicly announced as promptly as is reasonably practicable and normally at least five Index Business Days prior to the effective date of the changes. Changes to the Methodology made by the Index Committee will be publicly announced at least 60 New York business days prior to their effective date. Adjustments made by the Calculation Agent in response to market adjustment events and potential adjustment events will be publicly announced as promptly as is reasonably practicable.

Index Committee

An Index Committee is responsible for overseeing the Index and the Methodology, while the Calculation Agent is responsible for the day-to-day implementation of the Methodology, for the calculation of the Index, including responding to Market Disruption Events (as defined in Section 5 (*Market Disruption Events*) below) and potential adjustment events, and for publication of the Index Values and the Methodology. The Index Committee is comprised (as of the date hereof) of employees of The Goldman Sachs Group, Inc. or one or more of its affiliates. At least 40 percent of the committee is comprised of employees of non-revenue generating functions (such employees being "control side" employees). Other members consist of employees of The Goldman Sachs Group, Inc.'s global markets division, which includes employees who regularly trade the Underlying Assets. If the Index Committee exercises any discretion related to the Index, as described in this Methodology, such exercise of discretion must be approved by 100% of the control side employees present at the relevant Index Committee meeting.

The Index Committee may exercise limited discretion with respect to the Index, as contemplated by the Methodology, including in the situations described in Section 7 (*Changes to the Index Constituents*) below and "*Publication of Changes to the Index and to the Methodology*" above. Subject to the exceptions described under "*Publication of Changes to the Index and to the Methodology*", any such changes or actions are publicly announced as promptly as is reasonably practicable and normally at least 60 New York business days prior to their effective date. The Calculation Agent may from time to time consult the Index Committee on matters of interpretation with respect to the Methodology.

Because the Index Committee considers information about changes to the Index and related matters that may be potentially market moving and material, all Index Committee discussions, including those with the Calculation Agent, are confidential. The Index Committee will determine the successor of any of its members.

1. Base Index Values

1.1 **Calculation of the Base Index Value**

The Base Index Value on the Base Index Base Date (as defined in the Annex) is equal to 100. On any given Index Business Day$_{(t)}$ following the Base Index Base Date, the Base Index Value is calculated according to the following formula:

$$BI_t = BI_{t-1} \times \left[\frac{BITR_t}{BITR_{t-1}} - Interest\_Rate_{t-1} \times DCF_{t-1,t}\right]$$

Where:

Subscript$_{(t)}$ refers to the given Index Business Day$_{(t)}$;

Subscript$_{(t-1)}$ refers to the Index Business Day immediately preceding (but excluding) Index Business Day$_{(t)}$;

"*BI$_{date}$*" means the Base Index Value as of date$_{(date)}$;

"*BITR$_{date}$*" means the Base Index Total Return Value as of date$_{(date)}$;

"*Interest_Rate$_{t-1}$*" means the Notional Interest Rate as of date$_{(t-1)}$; and

"*DCF$_{t-1,t}$*" is the day count fraction for the period from (but excluding) date$_{(t-1)}$ to (and including) the given Index Business Day$_{(t)}$, determined by using the USD Rate Day Count Convention (as specified in Section 11 (*Annex*)).

1.2 **Calculation of the Base Index Total Return Value**

The Base Index Total Return Value on the Base Index Base Date is equal to 100. On any given Index Business Day$_{(t)}$ following the Base Index Base Date, the Base Index Total Return Value is calculated according to the following formula:

$$BI_t = BI_{t-1} \times \left[\frac{BITR_t}{BITR_{t-1}} - Interest\_Rate_{t-1} \times DCF_{t-1,t}\right]$$

Where:

Subscript$_{(t)}$ refers to the given Index Business Day$_{(t)}$;

Subscript$_{(t-1)}$ refers to the Index Business Day immediately preceding (but excluding) Index Business Day$_{(t)}$;

Subscript$_{(i)}$ refers to the relevant Underlying Asset;

"BITR$_{date}$" means the Base Index Total Return Value as of date$_{(date)}$;

"n" is the number of eligible Underlying Assets (10);

"$W_{i,date}^{BI}$" is the Underlying Asset Weight$_{(i)}$ of Underlying Asset$_{(i)}$ as of date$_{(date)}$ (which may be zero); and

"A$_{i,date}$" means the Underlying Asset Value$_{(i)}$ of Underlying Asset$_{(i)}$ as of date$_{(date)}$.

1.3 **Underlying Asset Weights, and Base Index Rebalancing**

The respective target weights of the Underlying Assets in the Base Index (each an "**Underlying Asset Target Weight**" and together the "**Underlying Asset Target Weights**"), which can be as low as zero (although US Large-Cap Equities and US Technology Equities must have a minimum combined weight of 20%), are determined for each Look-Back Period on each Index Business Day, within the investment and volatility maximum constraints described in the table "OVERVIEW OF THE UNDERLYING ASSETS" in Section 11 (*Annex*) below, by applying the Methodology algorithm. The weights of the Underlying Assets in the Base Index (each an

"**Underlying Asset Weight**" and together the "**Underlying Asset Weights**") will then be adjusted daily on each Index Business Day such that the weight of each Underlying Asset is equal to the average of the Averaged Underlying Asset Target Weights (which Averaged Underlying Asset Target Weights is the average of the Underlying Asset Target Weights determined in respect of each Look-Back Period) over the Weight Averaging Period.

1.3.1 *Calculation of the Underlying Asset Target Weights*

The target weight attributed to each Underlying Asset pursuant to the Methodology on each Index Business Day (regardless of whether a Market Disruption Event occurs on that day) is intended to maximize the total return performance of the Underlying Assets based on an analysis of the historical returns of the Underlying Assets, subject to the constraints included in the Methodology.

For each Look-Back Period (as specified below), the Methodology algorithm seeks to select — out of all the combinations of admissible Underlying Asset Target Weights within a set of investment constraints and volatility constraints described below — the combination with the highest Annualized Assets Combination Return. Among other things, this requires the Calculation Agent to calculate the Annualized Assets Combination Return and the Annualized Assets Combination Realized Volatility for each relevant Look-Back Period.

The Averaged Underlying Asset Target Weight for an Underlying Asset will be equal to the average of the target weights for that Underlying Asset determined in respect of each Look-Back Period (with rounding effects treated as described below under "*Rounding Convention*"). For the avoidance of doubt, rounding will be applied only when calculating the Averaged Underlying Asset Target Weight, but not at the level of each individual Look-Back Period.

If on an Index Business Day, for any Look-Back Period, no combination of Underlying Asset Target Weights comply with the pre-defined investment and volatility constraints, then the Methodology algorithm will successively relax the volatility constraints by increments of 0.50%, up until two times the initial volatility constraints, until a combination of Underlying Asset Target Weights can be found that complies with the pre-defined investment constraints and updated volatility constraint. If, after such relaxation, no combination of Underlying Asset Target Weights can be found, the Methodology algorithm will select from all combinations of Underlying Asset Target Weights that comply with the investment constraints, the combination with the lowest Annualized Assets Combination Realized Volatility, regardless of that combination's Annualized Assets Combination Return. The particular combination so selected will therefore exceed the volatility constraint.

The "**Look-Back Period**" on any given Index Business Day is the period from (and excluding) the day which falls respectively nine (9), six (6) or three (3) calendar months before the third Index Business Day prior to the given Index Business Day (or, if any such date is not an Index Business Day, the Index Business Day immediately preceding such day) to (and including) the third Index Business Day prior to the given Index Business Day.

- Investment Constraints: Investment constraints set a minimum weight and a maximum weight (specified in the section "OVERVIEW OF THE UNDERLYING ASSETS" in Section 11 (*Annex*)) for each Underlying Asset as well as a minimum weight and a maximum weight (specified in the section "OVERVIEW OF THE UNDERLYING ASSETS" in Section 11 (*Annex*)) for each Asset Class (for the avoidance of doubt, the sum of the weights for each Underlying Asset within an Asset Class has to be greater than or equal to the minimum weight for that Asset Class and less than or equal to the maximum weight for that Asset Class). Negative weights (that is, short positions) are not permitted by the Methodology, but weights can be as low as zero (although US Large-Cap Equities and US Technology Equities must have a minimum combined weight of 20%) so that the performance of zero-weighted Underlying Assets would not be reflected in the performance of the Base Index for the relevant periods. The sum of the weights of all Underlying Assets in the Base Index is always equal to 100% (with rounding effects treated as described below under "*Rounding Convention*").

  Where, among other situations described in Section 7 (*Changes to the Index Constituents*), an Underlying Asset ceases to exist, or is no longer tradable and is not replaced by the Index Committee in the manner described below, it will be deemed to have been assigned a zero weight in the Base Index and will be replaced with a hypothetical position in the Money Market Position. On the next Index Business Day, the weights of the remaining Underlying Assets will be calculated pursuant to the Methodology except that any Underlying Asset that ceases to exist, or is no longer

tradable will be assigned a zero weight. If either the US Large-Cap Equities or US Technology Equities cease to exist, or is no longer tradable and is not replaced by the Index Committee in the manner described below, the minimum combined weight of 20% applicable to those Underlying Assets will apply to the remaining Underlying Asset.

The minimum weight and maximum weight per Underlying Asset and the minimum weight and maximum weight per Asset Class applicable to the Base Index are set out in the section "OVERVIEW OF THE UNDERLYING ASSETS" in Section 11 (*Annex*).

- Volatility Constraint: The volatility constraint of the Methodology algorithm sets a limit of 5% on the Annualized Assets Combination Realized Volatility within a Look-Back Period of any selected combination of Underlying Asset Target Weights, which may be relaxed as described above if no admissible combination of Underlying Asset Target Weights satisfies the initial volatility constraint.

Realized volatility is a historical calculation of the degree of movement based on prices or values of an asset observed periodically in the market over a specified period. The realized volatility of an asset is characterized by the frequency of the observations of the asset price used in the calculation and the period over which observations are made.

1.3.2 *Calculation of the Underlying Asset Weights*

On each Index Business Day$_{(t)}$, the Underlying Asset Weight$_{(i)}$ of an Underlying Asset$_{(i)}$ is calculated according to the following:

$$w_{i,t}^{BI} = \frac{1}{10} \times \sum_{s} w_{i,s}^{Averaged\ Target}$$

Where:

Subscript$_{(i)}$ refers to the relevant Underlying Asset;

Subscript$_{(t)}$ refers to the relevant Index Business Day;

Subscript$_{(s)}$ refers to the relevant Index Business Day and each Index Business Day (on which no Market Disruption Event occurs or is continuing with respect to any Underlying Asset) prior to such Index Business Day within the relevant Weight Averaging Period;

"$W_{i,t}^{BI}$" is the Underlying Asset Weight$_{(i)}$ of Underlying Asset$_{(i)}$ on calendar date$_{(t)}$; and

"$W_{i,s}^{Averaged\ Target}$" is the Averaged Underlying Asset Target Weight$_{(i)}$ of Underlying Asset$_{(i)}$ on calendar date$_{(s)}$.

The "**Weight Averaging Period**" on any given Index Business Day is the period from (but excluding) the day which is 10 Index Business Days (on which no Market Disruption Event occurs or is continuing with respect to any Underlying Asset) prior to the given Index Business Day to (and including) the given Index Business Day.

1.3.3 *Calculation of the Averaged Underlying Asset Target Weights*

On each Index Business Day$_{(t)}$, the Averaged Underlying Asset Target Weight$_{(i)}$ of an Underlying Asset$_{(i)}$ is calculated according to the following formula:

$$w_{i,t}^{Averaged\ Target} = \frac{1}{3} \times \sum_{l=1}^{3} w_{i,t,l}^{Target}$$

Where:

Subscript$_{(i)}$ refers to the relevant Underlying Asset;

Subscript$_{(t)}$ refers to the relevant Index Business Day;

Subscript$_{(l)}$ refers to the relevant Look-Back Period;

"$W_{i,t}^{Averaged\ Target}$" is the Averaged Underlying Asset Target Weight$_{(i)}$ of Underlying Asset$_{(i)}$ on calendar date$_{(t)}$ (with rounding effects treated as described below under "Rounding Convention"); and

"$W_{i,t,l}^{Target}$" is the Underlying Asset Target Weight$_{(i)}$ of Underlying Asset$_{(i)}$ for the Look-Back Period$_{(l)}$ on calendar date$_{(t)}$ as determined by the Methodology algorithm.

Rounding Convention: The Averaged Underlying Asset Target Weights computed on each Index Business Day is rounded to the nearest three decimal places with 0.05% (0.0005) being rounded upward. For example, if the optimal Averaged Underlying Asset Target Weights is 12.36% (0.1236), it would be rounded up to 12.4% (0.124). The effect of rounding is that the sum of the rounded weights may not add up to 100%. For this reason, on each Index Business Day, the sum of the rounded Averaged Underlying Asset Target Weights is deducted from 100%. If the resulting excess weight is positive, it is added to the Underlying Asset with the highest average historical return over the three Look-Back Periods for that Index Business Day regardless of whether this might cause the Averaged Underlying Asset Target Weight to violate any of the constraints specified above. If the resulting excess weight is negative, its absolute value is subtracted from Averaged Underlying Asset Target Weight of the Underlying Asset that had the lowest average historical return over the three Look-Back Periods for that Index Business Day and an Averaged Underlying Asset Target Weights higher than the absolute value of the excess amount being deducted regardless of whether this might cause the Averaged Underlying Asset Target Weight to violate any of the constraints specified above.

1.3.4 *Calculation of the Annualized Assets Combination Return*

The Annualized Assets Combination Return, during the relevant Look-Back Period, of each admissible combination of Underlying Asset Target Weights, with respect to any given Index Business Day, is calculated according to the following formula:

$$AAC\_Return_t = \sum_{i=1}^{n} a_i \times AssetReturn_{i,t}$$

Where:

Subscript$_{(t)}$ refers to the relevant Index Business Day;

Subscript$_{(i)}$ refers to the relevant Underlying Asset;

"*AAC_Return*$_t$" is the Annualized Assets Combination Return, during the relevant Look-Back Period, of the given combination of Underlying Asset Target Weights on Index Business Day$_{(t)}$;

"*n*" is the number of Underlying Assets (10);

"a_i" is the Underlying Asset Target Weight$_{(i)}$ in the given combination of Underlying Asset Target Weights; and

"$Asset\ Return_{i,t}$" is the Annualized Asset Return of the Underlying Asset$_{(i)}$ as of the Index Business Day$_{(t)}$, and is calculated according to the following formula:

$$AssetReturn_{i,t} = \frac{252}{N_t} \times \sum_{s} \ln\left(\frac{A_{i,s}}{A_{i,s-1}}\right)$$

Where:

Subscript$_{(i)}$ refers to the relevant Underlying Asset;

Subscript$_{(t)}$ refers to the relevant Index Business Day;

Subscript$_{(s)}$ refers to each Index Business Day (on which no Market Disruption Event occurs or is continuing with respect to any Underlying Asset) within the relevant Look-Back Period;

"$Asset\ Return_{i,t}$" is the Annualized Asset Return, during the relevant Look-Back Period, of the Underlying Asset$_{(i)}$ on Index Business Day$_{(t)}$;

"N_t" is the actual number of Index Business Days (on which no Market Disruption Event occurs or is continuing with respect to any Underlying Asset) within the relevant Look-Back Period;

"$A_{i,s}$" is the Underlying Asset Value$_{(i)}$ of Underlying Asset$_{(i)}$ on Index Business Day$_{(s)}$; and

"$A_{i,s-1}$" is the Underlying Asset Value$_{(i)}$ of Underlying Asset$_{(i)}$ on the Index Business Day immediately preceding Index Business Day$_{(s)}$.

1.3.5 *Calculation of the Annualized Assets Combination Realized Volatility*

The Annualized Assets Combination Realized Volatility, during the relevant Look-Back Period, of each admissible combination of Underlying Asset Target Weights, with respect to any Index Business Day, is calculated according to the following formula:

$$AAC\_Realized\_Volatility_t = \sqrt{\sum_{i,j=1}^{n} a_i \times a_j \times AssetCovariance_{i,j,t}}$$

Where:

Subscript$_{(t)}$ refers to the relevant Index Business Day;

Subscript$_{(i)}$ and $_{(j)}$ refer to the relevant Underlying Assets;

"*AAC_Realized_Volatility*$_t$" is the Annualized Assets Combination Realized Volatility, during the relevant Look-Back Period, of the given combination of Underlying Asset Target Weights on Index Business Day$_{(t)}$;

"n" is the number of Underlying Assets (10);

"a_i" is the Underlying Asset Target Weight$_{(i)}$ in the given combination of Underlying Asset Target Weights;

"a_j" is the Underlying Asset Target Weight$_{(j)}$ in the given combination of Underlying Asset Target Weights; and

"$AssetCovariance_{i,j,t}$" is the Annualized Asset Co-Variance between Underlying Asset$_{(i)}$ and Underlying Asset$_{(j)}$ during the relevant Look-Back Period on Index Business Day$_{(t)}$, and is calculated according to the following formula:

$$AssetCovariance_{i,j,t} = \frac{252}{5 \times N_t} \times \sum_{s} \left[\ln\left(\frac{A_{i,s}}{A_{i,s-5}}\right) \times \ln\left(\frac{A_{j,s}}{A_{j,s-5}}\right) \right]$$

Where:

Subscript$_{(i)}$ and $_{(j)}$ refer to the relevant Underlying Assets;

Subscript$_{(s)}$ refers to each Index Business Day (on which no Market Disruption Event occurs or is continuing with respect to any Underlying Asset) within the relevant Look-Back Period;

Subscript$_{(t)}$ refers to the relevant Index Business Day;

"N_t" is the actual number of Index Business Days (on which no Market Disruption Event occurs or is continuing with respect to any Underlying Asset) within the relevant Look-Back Period;

"$A_{i,s}$" is the Underlying Asset Value$_{(i)}$ of Underlying Asset$_{(i)}$ on Index Business Day$_{(s)}$;

"$A_{i,s-5}$" is the Underlying Asset Value$_{(i)}$ of Underlying Asset$_{(i)}$ on the fifth (5th) Index Business Day immediately preceding Index Business Day$_{(s)}$;

"$A_{j,s}$" is the Underlying Asset Value$_{(j)}$ of Underlying Asset$_{(j)}$ on Index Business Day$_{(s)}$; and

"$A_{j,s-5}$" is the Underlying Asset Value$_{(j)}$ of Underlying Asset$_{(j)}$ on the fifth (5th) Index Business Day immediately preceding Index Business Day$_{(s)}$.

Rebalancing; Impact of Disruptions

If a Base Index rebalancing or an Index rebalancing must be effected on an Index Business Day which corresponds to the first day of a given Market Disruption Event (as defined in Section 5 (*Market Disruption Events*)) with respect to any Underlying Asset included in the Index, the Calculation Agent shall then rebalance the Base Index or the Index as if (i) for each Underlying Asset that had not been affected by such Market Disruption Event, the Index Business Day occurred on such day and (ii) for each Underlying Asset that had been affected by such Market Disruption Event, the Index Business Day occurred on the first day on which there was no Market Disruption Event occurring or continuing. An Index Business Day will be deemed not to occur on a business day if a Market Disruption Event is continuing (as opposed to occurring for the first time). Besides, an Additional Index Holiday will be deemed to occur on the first day on which there is no Market Disruption Event occurring or continuing after such Market Disruption Event and which is an Asset Business Day for all of the Underlying Assets.

Solely for purposes of calculating the volatility (variance) and volatility controlled index level which includes an Index Business Day, which corresponds to the first day of a given Market Disruption Event with respect to any Underlying Asset, the Base Index Value or the Underlying Asset Value will include any Underlying Asset that has been affected by a Market Disruption Event and will be calculated by assuming the Reference Level of the affected Underlying Asset is equal to the Reference Level on the first day on which there is no Market Disruption Event occurring or continuing.

On the sixth New York business day following the occurrence of a Market Disruption Event with respect to any Underlying Asset included in the Index, if such Market Disruption Event is continuing, the Index Committee may determine in its sole discretion to instruct the Calculation Agent to rebalance the Index using a specified price. In the event the Index Committee determines on such sixth New York business day, in its sole discretion, that no such instructions should be given to the Calculation Agent, the Index Committee may revisit such determination on any business day thereafter on which the Market Disruption Event is continuing.

2. Index Values

2.1 Calculation of the Index Value

The Index Value on the Index Base Date (as defined in Section 11 (*Annex*)) is equal to 100. On any following Index Business Day$_{(t)}$, the Index Value is calculated according to the following formulas:

$$IV_t = IV_{t-1} \times \left[1 + MRCE_{t-1} \times \left(\frac{VCIL_t}{VCIL_{t-1}} - 1\right) - (1 - MRCE_{t-1}) \times Deduction\_Rate \times DCF_{t-1,t}\right]$$

Where:

Subscript$_{(t)}$ refers to the given Index Business Day$_{(t)}$;

Subscript$_{(t-1)}$ refers to the Index Business Day immediately preceding (but excluding) Index Business Day$_{(t)}$;

"IV_{date}" refers to the Index Value as of date$_{(date)}$;

"$MRCE_{date}$" refers to the Momentum Risk Control Exposure as of date$_{(date)}$;

"$VCIL_{date}$" refers to the Volatility Controlled Index Level as of date$_{(date)}$;

"*Deduction_Rate*" refers to the Deduction Rate (as specified in Section 11 (*Annex*)); and

"$DCF_{t-1,t}$" is the day count fraction for the period from (but excluding) date$_{(t-1)}$ to (and including) the given date$_{(t)}$, determined by using the USD Rate Day Count Convention (as specified in Section 11 (*Annex*)).

2.2 **Calculation of the Momentum Risk Control Exposure**

On any Index Business Day$_{(t)}$, the Momentum Risk Control Exposure is calculated as follows:

$$MRCE_t = \frac{1}{21}\sum_{s} MRCE_s^{Target}$$

Where:

$$MRCE_t^{Target} = \left\{ \begin{matrix} 1 & if\ VCIL_t \geq VCIL_{t-100} \\ 0.25 & otherwise \end{matrix} \right\}$$

And where:

Subscript$_{(t)}$ refers to the given Index Business Day$_{(t)}$;

Subscript$_{(t-100)}$ refers to the one-hundredth (100th) Index Business Day immediately preceding (but excluding) Index Business Day$_{(t)}$;

Subscript$_{(s)}$ refers to each Index Business Day falling within the relevant Momentum Risk Control Exposure Averaging Period;

"$MRCE_t$" refers to the Momentum Risk Control Exposure as of date$_{(t)}$;

"$MRCE_{date}^{Target}$" refers to the Momentum Risk Control Target Exposure as of date$_{(date)}$;

"$VCIL_{date}$" refers to the Volatility Controlled Index Level as of date$_{(date)}$.

The "Momentum Risk Control Exposure Averaging Period" on any given Index Business Day is the period from (but excluding) the 23rd Index Business Day prior to the given Index Business Day to (and including) the 2nd Index Business Day prior to the given Index Business Day.

2.3 **Calculation of the Volatility Controlled Index Level**

The Volatility Controlled Index Level on the Volatility Controlled Index Base Date (as defined in the Annex) is equal to 100. On any following Index Business Day$_{(t)}$, the Volatility Controlled Index Level is calculated according to the following formulas:

$$VCIL_t = VCIL_{t-1} \times \left(1 + VCE_{t-1} \times \left(\frac{BI_t}{BI_{t-1}} - 1\right) - Deduction\_Rate \times DCF_{t-1,t}\right)$$

Where:

Subscript$_{(t)}$ refers to the given Index Business Day$_{(t)}$;

Subscript$_{(t-1)}$ refers to the Index Business Day immediately preceding (but excluding) Index Business Day$_{(t)}$;

"$VCIL_{date}$" refers to the Volatility Controlled Index Level as of date$_{(date)}$;

"VCE_{date}" refers to the Volatility Control Exposure as of date$_{(date)}$;

"BI_{date}" means the Base Index Value as of date$_{(date)}$;

"*Deduction_Rate*" refers to the Deduction Rate (as specified in Section 11 (*Annex*)); and

"$DCF_{t-1,t}$" is the day count fraction for the period from (but excluding) $date_{(t-1)}$ to (and including) the given $date_{(t)}$, determined by using the USD Rate Day Count Convention (as specified in Section 11 (*Annex*)).

In the sections above, the term (1- $VCE_{t-1} \times MRCE_{t-1}$) would correspond to the combined weight of the Non-Interest Bearing Cash Positions described in the "*Overview*" above.

2.4 Calculation of the Volatility Control Exposure

The Volatility Control Exposure with respect to any Index Business $Day_{(t)}$ is calculated according to the following formula:

$$VCE_t = \min(100\%, \frac{Volatility\ Control\ Level}{\max(BaseIndexRealizedVol_t^{0.94}, BaseIndexRealizedVol_t^{0.97})})$$

Where:

Subscript$_{(t)}$ refers to the given Index Business $Day_{(t)}$;

"VCE_t" refers to the Volatility Control Exposure with respect to $date_{(t)}$;

"*Volatility Control Level*" refers to the Volatility Control Level (as specified in Section 11 (*Annex*)); and

"$BaseIndexRealizedVol_t^{\lambda}$" refers to the Base Index Exponentially Weighted Realized Volatility with respect to a decay factor λ as of $date_{(t)}$.

2.5 Calculation of the Base Index Exponentially Weighted Realized Volatility

The Base Index Exponentially Weighted Realized Volatility on the Volatility Controlled Index Base Date (as defined in Section 11 (*Annex*)) is equal to the Volatility Control Level (as specified in Section 11 (*Annex*)). On each following Index Business $Day_{(t)}$, the Base Index Exponentially Weighted Realized Volatility is calculated as follows:

$$BaseIndexRealizedVol_t^{\lambda} = \sqrt{\lambda \times (BaseIndexRealizedVol_{t-1}^{\lambda})^2 + (1-\lambda) \times \frac{252}{5} \times \left[\ln\left(\frac{BI_{t-2}}{BI_{t-7}}\right)\right]^2}$$

Where:

Subscript$_{(t)}$ refers to the relevant Index Business Day;

Subscript$_{(t-x)}$ refers to the x-th Index Business Day immediately preceding (but excluding) Index Business $Day_{(t)}$;

"$BaseIndexRealizedVol_{date}^{\lambda}$" refers to the Base Index Exponentially Weighted Realized Volatility with a decay factor λ as of $date_{(date)}$;

"BI_{date}" means the Base Index Value as of $date_{(date)}$; and

"λ" is the decay factor.

3. Calculation of the Underlying Asset Value

3.1 The Underlying Asset Value of the Money Market Position

The Underlying Asset Value of the Money Market Position is equal to the Money Market Position Value, which is calculated as set forth under Section 3.3.1 (*Calculation of the Money Market Position Value*) below.

$$A_{MoneyMarketPosition,t} = MMPV_t$$

3.2 **The Underlying Asset Value of Other Underlying Assets**

3.2.1 Calculation of the Underlying Asset Values of Other Underlying Assets

The Underlying Asset Value$_{(i)}$ of an Underlying Asset$_{(i)}$ on the Underlying Asset Base Date (as defined in Section 11 (*Annex*)) is equal to 100. On any Asset Business Day$_{(t)}$ following the Underlying Asset Base Date, the Underlying Asset Value$_{(i)}$ of Underlying Asset$_{(i)}$ is calculated according to the following formula:

(i) If the Underlying Asset Currency (as specified in the section "*OVERVIEW OF THE UNDERLYING ASSETS" in Section 11 (Annex)) of such Underlying Asset is U.S. dollars*:

$$A_{i,t} = A_{i,t-1} \times \frac{RL_{i,t}}{RL_{i,t-1}}$$

(ii) Otherwise:

$$A_{i,t} = A_{i,t-1} \times \left[\frac{DFA_{i,t}^{USD}}{DFA_{i,t-1}^{USD}} - \left(\frac{CFA_{i,t}^{CCY}}{CFA_{i,t-1}^{CCY}} \times \frac{FX_{i,t}}{FX_{i,t-1}}\right) + \left(\frac{RL_{i,t}}{RL_{i,t-1}} \times \frac{FX_{i,t}}{FX_{i,t-1}}\right)\right]$$

Where:

Subscript$_{(t)}$ refers to the given Asset Business Day;

Subscript$_{(i)}$ refers to the given Underlying Asset;

Subscript$_{(t-1)}$ refers to the Asset Business Day immediately preceding (but excluding) Asset Business Day$_{(t)}$;

Subscript$_{(CCY)}$ refers to the relevant currency;

"$A_{i,date}$" means the Underlying Asset Value$_{(i)}$ of Underlying Asset$_{(i)}$ as of date$_{(date)}$;

"$RL_{i,date}$" means the Reference Level of Underlying Asset$_{(i)}$ as of date$_{(date)}$;

"$FX_{i,date}$" means the applicable Currency Exchange Rate for Underlying Asset$_{(i)}$ as of date$_{(t)}$;

"$DFA_{i,date}^{USD}$" means the U.S. Dollar Financing Amount Level (determined as described in Section 3.2.2 (*Calculation of the U.S. Dollar Financing Amount Level*)) as of date$_{(date)}$; and

"$CFA_{i,date}^{CCY}$" means the Currency Financing Amount Level (determined as described in Section 3.2.3 (*Calculation of the Currency Financing Amount Levels*)) for the currency in which the non-U.S. dollar denominated Index Component$_{(i)}$ is denominated as of date$_{(date)}$.

Note: If on any day the U.S. Dollar Financing Amount Level or the Currency Financing Amount Level is zero, the Index Committee may determine in its sole discretion to instruct the Calculation Agent to calculate the Underlying Asset Value using an alternative formula.

3.2.2 *Calculation of the U.S. Dollar Financing Amount Level*

The U.S. Dollar Financing Amount Level has an initial value of 100 as of the U.S. Dollar Financing Amount Base Date (as defined in Section 11 (*Annex*)).

On any calendar date$_{(t)}$ that is not a Saturday or Sunday following the U.S. Dollar Financing Amount Base Date, the "**U.S. Dollar Financing Amount Level**" will be calculated according to the following formula:

$$DFA_t^{USD} = DFA_{NRt}^{USD} \times \left(1 + NIR_{NRt} \times DCF_{NRt,t}\right)$$

Where:

Subscript$_{(t)}$ refers to the given calendar day that is not a Saturday or Sunday;

Subscript$_{(NRt)}$ refers to the Notional Interest Rate Reset Day (as defined in Section 11 (*Annex*)) immediately preceding day$_{(t)}$;

"DFA_t^{USD}" means the U.S. Dollar Financing Amount Level as of date$_{(t)}$;

"DFA_{NRt}^{USD}" means the U.S. Dollar Financing Amount Level as of date$_{(NRt)}$;

"NIR_{NRt}" means the Notional Interest Rate as of date$_{(NRt)}$; and

"$DCF_{NRt,t}$" is the day count fraction for the period from (but excluding) date$_{(NRt)}$ to (and including) date$_{(t)}$, determined by using the USD Rate Day Count Convention (as specified in Section 11 (*Annex*)).

Note: If on any day the level is equal to or less than zero, the level shall be deemed to be zero on such day and for all future days.

3.2.3 *Calculation of the Currency Financing Amount Levels*

The Currency Financing Amount Level of each of the relevant currencies has an initial value of 100 as of the Currency Financing Amount Base Date (as specified in Section 11 (*Annex*)).

On any calendar date$_{(t)}$ that is not a Saturday or Sunday following the Currency Financing Amount Base Date, the "**Currency Financing Amount Level**" for each of the relevant currencies will be calculated according to the following formula (on the Currency Financing Amount Base Date, the level is 100):

$$CFA_t^{CCY} = CFA_{CRt}^{CCY} \times \left(1 + R_{CRt}^{CCY} \times DCF_{CRt,t}^{CCY}\right)$$

Where:

Subscript$_{(t)}$ refers to the given calendar day that is not a Saturday or Sunday;

Subscript$_{(CRt)}$ refers to the Currency Financing Amount Rate Reset Day (as specified in Section 11 (*Annex*)) immediately preceding day$_{(t)}$;

Superscript$_{(CCY)}$ refers to the relevant currency;

"CFA_t^{CCY}" means the Currency Financing Amount Level of the relevant currency as of the date$_{(t)}$;

"CFA_{CRt}^{CCY}" means the Currency Financing Amount Level of the relevant currency as of date$_{(CRt)}$;

"R_{CRt}^{CCY}" means the Currency Financing Amount Rate of the relevant currency as of date$_{(CRt)}$; and

"$DCF_{CRt,t}^{CCY}$" is the day count fraction for the period from (but excluding) date$_{(CRt)}$ to (and including) date$_{(t)}$, determined by using the Currency Financing Amount Rate Day Count Convention of the relevant currency (as specified in Section 11 (*Annex*)).

Note: If on any day the level is equal to or less than zero, the level shall be deemed to be zero on such day and for all future days.

3.3 **Calculation of the Money Market Position**

The Money Market Position is intended to express the notional returns accruing to a hypothetical investor from an investment in a notional overnight money account denominated in U.S. dollars that accrues interest at a rate determined by reference to the Notional Interest Rate (Fed Fund Rate, determined as specified in Section 11 (*Annex*)). The Money Market Position will have a positive notional return if the Notional Interest Rate is positive.

3.2.1 *Calculation of the Money Market Position Value*

The value of the Money Market Position (the "**Money Market Position Value**") is equal to 100 on the Money Market Base Date (as defined in Section 11 (*Annex*)). On any Asset Business Day$_{(t)}$ following the Money Market Base Date, the Money Market Position Value will be calculated according to the following formula:

$$MMPV_t = MMPV_{IRt} \times \left(1 + R_{IRt} \times DCF_{IRt,t}\right)$$

Where:

Subscript$_{(t)}$ refers to the given calendar date;

Subscript$_{(IRt)}$ refers to the Notional Interest Rate Reset Day immediately preceding calendar date$_{(t)}$;

"$MMPV_t$" means the Money Market Position Value as of date$_{(t)}$;

"$MMPV_{IRt}$" means the Money Market Position Value as of date$_{(IRt)}$;

"R_{IRt}" means the Notional Interest Rate as of date$_{(IRt)}$; and

"$DCF_{IRt,t}$" is the day count fraction for the period from (but excluding) date$_{(IRt)}$ to (and including) date$_{(t)}$, determined by using the USD Rate Day Count Convention (as specified in Section 11 (*Annex*)).

Note: If on any day the value is equal to or less than zero, the value shall be deemed to be zero on such day and for all future days.

4. Historical Data

The "**Launch Date**" for the Index, which is the date the Calculation Agent began calculating the Index, is specified in Section 11 (*Annex*). Therefore, historical information provided for the period from the Index Base Date until the Launch Date is hypothetical and is provided as an illustration of how the Index would have performed during the period had the Calculation Agent begun calculating the Index on the Index Base Date using the Methodology. This data does not reflect actual performance, nor was a contemporaneous investment model run on the Index. Historical information for the period from and after the Launch Date is based on the actual performance of the Index.

Historical levels of the Index are calculated with reference to the Reference Levels of the Underlying Assets determined based on the latest available data published by the relevant Underlying Asset Sponsors (as specified in Section 11 (*Annex*)).

5. Market Disruption Events

Capitalised terms defined in this Section 5 (*Market Disruption Events*) shall have the meaning given to them solely for the purposes of this Section 5 (*Market Disruption Events*) unless otherwise specified or cross-referred to.

A "**Market Disruption Event**" may be deemed by the Index Committee to have occurred in any of the following situations:

(i) the official closing price, level, rate or other measure of any Index Constituent is unavailable on any relevant day on which such measure is scheduled to be published (including cases where a member of the Goldman Sachs Group is the Index Component Sponsor, publisher or benchmark provider of an Index Constituent);

(ii) a relevant Exchange is not open for trading during its regular trading session, or closes prior to its scheduled closing time, on any relevant day or there is a material Exchange Disruption (as determined by the Calculation Agent);

(iii) upon the occurrence or existence of a Trading Disruption, for more than two hours of trading, or at any time during the one-hour period that ends at the scheduled closing time of the relevant Exchange;

(iv) upon the occurrence or existence of an Index Dislocation;

(v) upon the occurrence or existence of a Force Majeure Event;

(vi) upon the occurrence or existence of a Currency Exchange Rate Disruption Event; or

(vii) upon the occurrence or existence of an Interest Rate Disruption Event.

Where:

"**Trading Disruption**" means any suspension of or limitation imposed on trading by the relevant Exchange, and whether by reason of movements in price exceeding limits permitted by the relevant reference exchange or otherwise, relating to any component of an Index Component.

"**Exchange Disruption**" means any event that disrupts or impairs (as determined by the Calculation Agent in consultation with the Index Committee) the ability of market participants in general to effect transactions in, materially increases the costs of transacting in, or obtain market values for, any Index Component or its underlying constituents on the relevant Exchange.

"**Exchange** " means the relevant exchanges on which the components of the Index Components are traded as set forth in Section 11 (*Annex*).

"**Index Dislocation**" means the Calculation Agent (in consultation with the Index Committee) determines that a market participant, as a result of a market-wide condition relating to the Index or any Index Constituent would (i) be unable, after using commercially reasonable efforts, to acquire, establish, re-establish, substitute, maintain, unwind, or dispose of all or a material portion of any hedge position relating to the Index or an Index Constituent, or (ii) incur a materially increased cost in doing so, including due to any capital requirements or other law or regulation.

"**Force Majeure Event**" means the Calculation Agent determines that there has been the occurrence of a systems failure, natural or man-made disaster, act of God, armed conflict, act of terrorism, riot or labor disruption or any similar intervening circumstance that is beyond the reasonable control of the Index Sponsor, Calculation Agent or any of their respective affiliates that the Calculation Agent determines is likely to have a material effect on an Index Constituent, or on its ability to perform its role in respect of the Index.

"**Currency Exchange Rate Disruption Event**" means (and a Currency Exchange Rate Disruption Event shall be deemed to have occurred if):

(i) in respect of a Currency Exchange Rate and a relevant day:

(a) such currency exchange rate splits into dual or multiple currency exchange rates;

(b) the currency exchange rate specified in the Annex is not published on a date on which it is scheduled for publication and the Calculation Agent is unable to determine (after consultation with the Index Committee) any commercially reasonable substitute;

(c) an event has occurred in or affecting any relevant jurisdiction that generally makes it impossible to deliver (1) a relevant currency (as specified in the Annex) from accounts inside such jurisdiction to accounts outside such jurisdiction, or (2) a relevant currency (as specified in the Annex) between accounts inside such jurisdiction for the applicable reference currency or to a party that is a non-resident of such jurisdiction; or

(d) the applicable reference currency ceases to exist and has not been replaced by a new currency; and

(ii) in respect of a Currency Financing Amount Rate and a relevant day:

(a) such Currency Financing Amount Rate is not published on a date on which it is scheduled for publication; or

(b) such Currency Financing Amount Rate is no longer published.

"**Interest Rate Disruption Event**" means (and an Interest Rate Disruption Event shall be deemed to have occurred if), in respect of the Notional Interest Rate and a relevant day:

(i) such Notional Interest Rate is not published on a date on which it is scheduled for publication; or

(ii) such Notional Interest Rate is no longer published.

On any Index Business Day which corresponds to the first day of a given Market Disruption Event, the Calculation Agent shall postpone calculation of the Index Value to the next Index Business Day on which no Market Disruption Event is occurring or continuing and which is not an Additional Index Holiday, and an indicative level for the Index may be published. Such level will be identified as a "disrupted indicative level." The Calculation Agent shall resume calculating and publishing the Index Value for the first Index Business Day on which no Market Disruption Event is occurring or continuing and which is not an Additional Index Holiday, as determined by the Index Committee. An Index Business Day will be deemed not to occur on a business day if a Market Disruption Event is continuing (as opposed to occurring for the first time). Besides, an Additional Index Holiday will be deemed to occur on the first day on which there is no Market Disruption Event occurring or continuing after such Market Disruption Event and which is an Asset Business Day for all of the Underlying Assets. The Calculation Agent, in consultation with the Index Committee, may use the Currency Financing Amount Rate or Notional Interest Rate in effect prior to such market disruption during the period of any market disruption event with respect to a Currency Financing Amount Rate. On the sixth New York business day following the occurrence of a Market Disruption Event with respect to any Index Constituents, if such Market Disruption Event is continuing and the affected Index Constituents have not been removed from the Index, the Index Committee may determine in its sole discretion to instruct the Calculation Agent to calculate the Index, using a price for such Index Constituents as determined by the Index Committee in its sole discretion. In the event the Index Committee determines on such sixth New York business day, in its sole discretion, that no such instructions should be given to the Calculation Agent, the Index Committee may revisit such determination on any business day thereafter on which the Market Disruption Event is continuing.

6. **Revision to Index Values in the Event of Data Error**

If the Calculation Agent determines that the price made available for an Index Constituent (or the published level of a Notional Interest Rate, Currency Exchange Rate or Currency Financing Amount Rate) reflects a manifest error, the calculation of the Index shall be delayed until such time a corrected price or level is made available. In the event a corrected price or level with respect to an Index Constituent is not made available on a timely basis, or in the event that the price made available for an Index Constituent is subsequently corrected and such correction is published, then the Calculation Agent may, if practicable, adjust or correct the relevant calculation or determination, including the level of the Index Constituent, as of any Index Business Day to take into account such correction.

On any Index Business Day during which the price, level or rate of an Index Constituent reflects such an error (and such error has not been corrected), the Underlying Asset Weights, Volatility Control Exposure and the Momentum Risk Control Exposure will be calculated using the price, level or rate made available by the relevant sponsor, publisher or provider of such Index Constituent (an "**Index Constituent Sponsor**") (notwithstanding any manifest error). If the relevant Index Constituent Sponsor subsequently corrects the price it has made available, the Index Value may be calculated using such corrected price, but the quantities of Index Constituents implied by the Underlying Asset Weights, Volatility Control Exposure and the Momentum Risk Control Exposure (prior to the error being corrected) may or may not be adjusted by the Index Committee.

7. **Changes to the Index Constituents**

The designated Index Components, Cash Position Components, Currency Financing Amount Rates (as defined in Section 11 (*Annex*)), Currency Exchange Rates and the Notional Interest Rate (or a stock, government bond instrument or other market measure underlying such Index Constituent, or option or futures contract related thereto, which the Index Committee determines is necessary to effectively replicate its performance) (collectively, the "**Index Constituents**" and each an "**Index Constituent**"), are not expected to be changed or replaced. However, if the Index Committee determines that any of the following events has occurred:

- the Index Component Sponsor (as described in "*OVERVIEW OF UNDERLYING ASSETS*" in Section 11 (*Annex*)) of an Index Component announces that it will make a material change in the formula for or the method of calculating such Index Component (or the selection of the components thereof) or otherwise materially modifies such Index Component (or the selection of the components thereof) for the purpose of maintaining such Index Component;

- an Index Component is no longer published by its Index Component Sponsor;

- an Index Component, its constituents or derivative instruments linked thereto, are no longer tradable on commercially reasonable terms (as determined by the Calculation Agent in consultation with the Index Committee) in light of changes to financial market conditions (including market liquidity), regulatory or similar factors;

- any third-party Index Component Sponsor of an Index Component terminates its license with the Index Sponsor and its affiliates such that the Index Sponsor may not use the Index Component or any related index in connection with any financial product or index;

- the Index Sponsor and its affiliates cease to have the relevant data license in respect of an Index Component;

- the applicable Currency Exchange Rate, related currency or Currency Financing Amount Rate ceases to exist; or

- the Notional Interest Rate ceases to exist,

then the affected Index Constituent will be replaced by a successor constituent that, in the determination of the Index Committee in its sole discretion, most closely replicates, in the case of an index, the constituents and method of calculation of the Index Component, or, with respect to a successor interest or exchange rate, most closely captures the relevant market measure and satisfies any other criteria of an effective benchmark identified by the Index Committee, and the Index Sponsor may use such constituent as a successor Index Constituent. If the Index Committee determines in its sole discretion that no successor constituent exists, such Index Constituent will be removed from the Index.

Such deletions and substitutions may be undertaken on any date. The effective date will be determined at the discretion of the Index Committee and may be applied retroactively (although the Index Committee will seek to announce any such deletions or substitutions as promptly as is reasonably practicable), and will be reflected in an updated version of this Methodology. The Index Committee may permit the use of a temporary Index constituent until a permanent successor Index Constituent is identified.

8. Publication of Changes to the Index and to the Methodology

Changes to the components of the Index made by the Calculation Agent or, in certain cases, the Index Committee, will be publicly announced as promptly as is reasonably practicable and normally at least five Index Business Days prior to the effective date of the changes. Changes to the Methodology made by the Index Committee will be publicly announced at least 60 New York business days prior to their effective date. Adjustments made by the Calculation Agent in response to market adjustment events and potential adjustment events will be publicly announced as promptly as is reasonably practicable. Notwithstanding the foregoing, the Index Committee may modify the Index (including its composition), the Methodology or any data obtained from a third party, in its sole discretion and without notice to correct any manifest error, or to cure or correct any ambiguity, contradiction or defect, in the description or operation of the Index.

9. Other Information

Licensing Information

Goldman Sachs & Co. LLC is the sole licensing agent for the Index. Questions about licensing the Index can be directed to the group listed under "Contact Information" below.

Contact Information

STS Group: gs-sts-all@gs.com

Calculation Agent Website

http://www.solactive.com/

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11. **Annex**

Index Base Date	3 August 2020
Base Index Base Date	6 January 2020
Volatility Controlled Index Base Date	17 January 2020
Underlying Asset Base Date	30 April 2013
Launch Date	12 January 2021
Index Bloomberg Ticker	GSMBFC5 Index
Index Reuters Ticker	.GSMBFC5

Index Business Day	Each day which is an Asset Business Day for all of the Underlying Assets and on which no Market Disruption Event is continuing, and such day is not an Additional Index Holiday (as described in *"Rebalancing; Impact of Disruptions"*). For the avoidance of doubt, for purposes of this definition of "Index Business Day", a Market Disruption Event is not deemed to be continuing on the first day such Market Disruption Event occurs.
Asset Business Day	In respect of: (i) the Money Market Position, a calendar day that is not a Saturday or Sunday; and (ii) any other Underlying Asset: each day which is a business day for the associated Index Component according to the holiday calendar of such associated Index Component (see "Additional Information" as specified in "OVERVIEW OF UNDERLYING ASSETS" in Section 11 (*Annex*))
Reference Level	In respect of each Underlying Asset, on any given calendar day in respect of such Underlying Asset, the closing level of the relevant Underlying Asset as published by the relevant Underlying Asset Sponsor or Underlying Asset Data Sponsor in respect of such calendar day.
Volatility Control Level	5%
Deduction Rate	0.65% per annum
Money Market Base Date	10 January 1994
Notional Interest Rate	USD-FEDERAL-FUNDS-H15 (as provided by Reuters on page FEDFUNDS1 or by another recognized source used for the purpose of displaying such rate). For any given calendar day which is not a scheduled publication day for the Notional Interest Rate, the Calculation Agent will use for such calendar day the Notional Interest Rate for the scheduled publication day immediately preceding such calendar day.
Notional Interest Rate Reset Day	Each day which is a New York business day
USD Rate Day Count Convention	Actual/360, meaning the number of days in the relevant period divided by 360.

<table>
<tr><td rowspan="4">"Currency Financing Amount Rates" and "Currency Financing Amount Business Days"</td><td>Currency</td><td>Currency Financing Amount Rate</td><td>Currency Financing Amount Rate Business Days</td><td>Currency Financing Amount Rate Day Count Convention</td><td>Currency Financing Amount Base Date</td></tr>
<tr><td>EUR</td><td>On or before 31 December 2021, EUR-EONIA (as provided by Reuters on EONIA RSF.REC.EONIA=.NaE or another recognized source, as determined by the Calculation Agent, used for the purpose of displaying such rate).

On or after 3 January 2022, 8.5bps + €STR (as provided by Reuters on EUROSTR= or another recognized source, as determined by the Calculation Agent, used for the purpose of displaying such rate).</td><td>Business days as per TARGET system</td><td>Actual/360, meaning the number of days in the relevant period divided by 360</td><td>4 January 1999</td></tr>
<tr><td>JPY</td><td>JPY-BOJ-TONAT (as provided by Reuters on RSF.REC.JPONMU=RR.NaE or another recognized source, as determined by the Calculation Agent, used for the purpose of displaying such rate)</td><td>Business days in Tokyo</td><td>Actual/365 Fixed, meaning the number of days in the relevant period divided by 365</td><td>3 December 2004</td></tr>
<tr><td colspan="5">For any given calendar day which is not Currency Financing Amount Rate Business Day, the Calculation Agent will use the level of such Currency Financing Amount Rate published for the Currency Financing Amount Rate Business Day immediately preceding such calendar</td></tr>
<tr><td>Currency Financing Amount Rate Reset Day</td><td colspan="5">In respect of a Currency Financing Amount Rate, each day which is a Currency Financing Amount Rate Business Day</td></tr>
<tr><td>"U.S. Dollar Financing Amount Base Date"</td><td colspan="5">10 January 1994</td></tr>
</table>

Currency Exchange Rate	**One JPY into USD:** The 4 p.m. London time closing spot mid rate for converting one unit of Japanese yen into US dollar as published by WM Performance Services or any successor company. **One EUR into USD:** The 4 p.m. London time closing spot mid rate for converting one unit of Euro into US dollar as published by WM Performance Services or any successor company. The days on which the Currency Exchange Rates are usually fixed and published, as determined by the Calculation Agent, by WM Performance Services or any successor company are referred to herein as "**Fixing Days**". If any calendar day is not a Fixing Day, the Calculation Agent will use the level of the relevant Currency Exchange Rate published for the applicable Fixing Day immediately preceding such calendar day. If any calendar day is a Fixing Day but the applicable Currency Exchange Rate is not available on such day at the applicable time indicated above, the Calculation Agent (after consultation with the Index Committee) shall determine the Currency Exchange Rate in a commercially reasonable manner.

OVERVIEW OF THE UNDERLYING ASSETS

Underlying Asset	Return Type	Underlying Asset Currency	Underlying Asset Sponsor	Bloomberg/ Reuters Page	Index Calculation Agent	Reference Exchange	Futures Contracts	Minimum Weight	Maximum Weight	Asset Class Group	Asset Class Minimum Weight	Asset Class Maximum Weight	Additional Information
US Equity Futures Rolling Strategy Index ("US Large-Cap Equities")	Total Return	USD	Goldman Sachs International	FRSIUSE Index	S&P Dow Jones LLC	Chicago Mercantile Exchange	E-mini S&P 500® Index futures contracts	0.0%	30.0%	Focused U.S. Equities	20%	50%	Appendix 1
US Technology Equity Futures Rolling Strategy Series Q Total Return Index ("US Technology Equities")	Total Return	USD	Goldman Sachs International	GSISNQET Index	Goldman Sachs International	Chicago Mercantile Exchange	E-mini NASDAQ 100 Stock Index futures contracts	0.0%	30.0%				Appendix 2
European Equity Futures Rolling Strategy Index	Total Return	EUR	Goldman Sachs International	FRSIEUE Index	STOXX Limited	Eurex	Dow Jones EURO STOXX 50® Index futures contracts	0.0%	30.0%	Other Developed Market Equities	0%	50%	Appendix 3
Japanese Equity Futures Rolling Strategy Index	Total Return	JPY	Goldman Sachs International	FRSIJPE Index	S&P Dow Jones LLC	Osaka Securities Exchange	TOPIX® Stock Price Index futures contracts	0.0%	30.0%				Appendix 4
US Government Bond Futures Rolling Strategy Index	Total Return	USD	Goldman Sachs International	FRSIUSB Index	S&P Dow Jones LLC	Chicago Mercantile Exchange	Futures contracts on government bonds of the USA	0.0%	60.0%				Appendix 5

European Government Bond Futures Rolling Strategy Index	Total Return	EUR	Goldman Sachs International	FRSIEUB Index	S&P Dow Jones LLC	Eurex	Futures contracts on federal bonds of the Federal Republic of Germany	0.0%	60.0%	Developed Market Fixed Income	0%	80%	Appendix 6
Japanese Government Bond Futures Rolling Strategy Index	Total Return	JPY	Goldman Sachs International	FRSIJPB Index	S&P Dow Jones LLC	Osaka Securities Exchange	Futures contracts on government bonds of Japan	0.0%	60.0%				Appendix 7
Emerging Markets Equity Futures Rolling Strategy Index	Total Return	USD	Goldman Sachs International	FRSIEME Index	S&P Dow Jones LLC	ICE Futures U.S.	MSCI Emerging Markets futures contracts	0.0%	20.0%	Emerging Market Equities	0%	20%	Appendix 8
Bloomberg Gold Subindex Total Return	Total Return	USD	Bloomberg	BCOMGCTR Index	Bloomberg	Trading Facilities* of the Commodity Contracts included in the Bloomberg Gold Subindex Total Return	Commodity Contracts included in the Bloomberg Gold Subindex Total Return	0.0%	25.0%	Commodities	0%	25%	https://www.bloomberg.com/professional/product/indices/bloomberg-commodity-index-family/
Money Market Position**	Total Return	USD	N/A	N/A	N/A	N/A	N/A	0%	80%	Cash Equivalent	0%	80%	N/A

***** "**Trading Facility**" means, in respect of a relevant Commodity Contract, the exchange or trading facility or principal trading market on which such Commodity Contract is traded, or any successor to such exchange or trading facility or principal trading market to which trading in such Commodity Contract has temporarily relocated, as determined by the Index Calculation Agent.

**As described in the Methodology.".

Interpretation

To the extent that there is any inconsistency between (a) any statement in this Prospectus Supplement and (b) any other statement in or incorporated by reference into the Base Prospectus, the statements in (a) above will prevail.

References to the Base Prospectus shall hereafter mean the Base Prospectus as supplemented by this Prospectus Supplement.

U.S. notice

This Prospectus Supplement is not for use in, and may not be delivered to or inside, the United States.

The date of this Prospectus Supplement is 26 June 2025.

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