

SGD SOR Cessation

Consultation

August 2022

LCH The Markets'
Partner

Disclaimer – Consultation Document:

*The contents of this paper are for informational purposes only and set out LCH Limited's proposals in connection with SGD SOR cessation. All proposals herein remain subject to LCH Limited's internal Risk and Legal approval and external regulatory review or approval. The proposals set out herein **are subject to change** based on feedback or otherwise. LCH Limited expressly disclaims, to the extent permitted by law, any liability in connection with this document and its contents. Clearing Members and their clients should take their own legal and other advice regarding *IBOR reform.*

All rights reserved. SwapClear is a trademark of LCH Limited.

Background and market context

LCH Ltd (LCH) has consistently supported its users as part of industry-wide efforts to transition from IBORs to alternative risk-free rates (RFRs). In particular, SwapClear undertook several conversion processes in late 2021 to convert outstanding contracts linked to EONIA and to CHF/ EUR/ GBP/ JPY LIBORs into corresponding RFR-based contracts, shortly before the index cessation effective date of the relevant rates¹. While LCH's conversion processes in respect of any benchmark to be discontinued are a back-stop, and while LCH encourages market participants to actively consider transitioning ahead of them, we nonetheless need to design and deploy suitably robust arrangements.

As strong proponents of global benchmark reform initiatives, we continue to collaborate with our market partners, including with regards to developments in the USD and SGD markets, both of which are affected by the cessation of USD LIBOR. In line with the cessation of USD LIBOR, about which LCH has recently consulted², all tenors of SGD SOR will be discontinued after 30 June 2023. As announced via member circular on 19 January 2021³, Fallback Rate (SOR) – previously referred to as 'Adjusted SOR' – would apply in fulfilment of LCH-cleared SOR contracts after this date. The Fallback Rate (SOR) definition has been developed by ISDA in the context of its wider effort to support benchmark transition in derivatives markets. Specifically, ISDA published the IBOR Fallbacks Supplement and IBOR Fallbacks Protocol on 23 October 2020⁴, which became effective on 25 January 2021⁵. The Supplement incorporated the fallbacks into new covered IBOR derivatives referencing the 2006 ISDA Definitions, including with regards to contracts referring to SOR, and was incorporated into LCH's Rulebook.

In August 2019, the Association of Banks in Singapore and the Singapore Foreign Exchange Market Committee (ABS-SFEMC) identified SORA as the recommended alternative to SOR⁶. Subsequently, at the end of July 2021, the Steering Committee for SOR & SIBOR Transition to SORA (SC-STs) recommended that by 30 September 2021, all financial institutions and their customers would cease usage of SOR in new derivatives contracts, with the exception of transactions undertaken for risk management of and transition from legacy SOR positions⁷. Whilst the cessation of SOR at the end of June 2023 will contractually trigger the activation of Fallback Rate (SOR) in SOR trades, SC-STs stated in its report that an explicit conversion of SOR contracts into SORA equivalents is preferred, since Fallback Rate (SOR) is only an interim rate that will be discontinued after 31 December 2024⁸.

Most recently, SC-STs published the outcome of its consultation on adjustment spreads for the conversion of SOR contracts to SORA⁹. The discontinuation of Fallback Rate (SOR) triggers a further fallback under ISDA's waterfall to the MAS Recommended Rate ("MAS-RR"). The outcome of this consultation has confirmed that: (i) MAS-RR will involve a formulaic link such that payments based on it for periods ending after 31 December 2024 can be projected based exclusively on SORA market data; and (ii) LCH will therefore be able to determine a cash compensation amount for such periods should LCH convert its SOR contracts to SORA-based contracts in line with previous conversion processes.

¹ LCH Ltd converted a total of ~ 350,000 contracts, totalling a total notional converted of ~€13 trillion (EONIA to €STR conversion), ~\$6 trillion (CHF, EUR, and JPY LIBOR contract conversion into SARON, ESTR and TONA equivalents) and ~€11 trillion (GBP LIBOR to SONIA conversion).

² LCH's Consultation on Conversion of Outstanding USD LIBOR® SwapClear Contracts | LCH Group

³ <https://www.lch.com/membership/ltd-membership/ltd-member-updates/update-lch-limiteds-position-libor-cessation-and>

⁴ ISDA Launches IBOR Fallbacks Supplement and Protocol – International Swaps and Derivatives Association

⁵ New IBOR Fallbacks Take Effect for Derivatives – International Swaps and Derivatives Association ([isda.org](https://www.isda.org))

⁶ [consultation-report.pdf \(abs.org.sg\)](#)

⁷ [sc-sts-recommendations-for-transition-of-legacy-sor-contracts.pdf \(abs.org.sg\)](#)

⁸ [media-release-on-sc-sts-recommendations-for-legacy-sor-transition.pdf \(abs.org.sg\)](#)

⁹ [industry-steering-committee-finalises-the-key-settings-of-the-mas-recommended-rate-and-supplementary-guidance-for-active-transition-of-legacy-wholesale-market-sor-contracts-to-sora.pdf \(abs.org.sg\)](#)

While the interaction between the arrangements above can be complex, absent further intervention from LCH the position for LCH-cleared SOR contracts can be broken down into three time periods:

1. for each period of a SOR contract that relies on a SOR fixing up to and including 30 June 2023 (“Phase 1”), we would be able to refer to SOR itself;
2. for each period of a SOR contract that relies on a SOR fixing after 30 Jun 2023 but which ends on or before 31 December 2024 (“Phase 2”), we would be required to refer to Fallback Rate (SOR); and
3. For each period of a SOR contract ending after 31 December 2024 (“Phase 3”), we would be required to refer to the MAS Recommended Rate.

LCH is seeking to solve the challenges associated with each of these three phases, and we set out proposals in each case below.

SOR contracts and the challenges stemming from the application of Fallback Rate (SOR)

The original SOR formulation can be summarised as generating an implied forward-looking rate for SGD deposits from a combination of a forward-looking USD reference rate (USD LIBOR) and a forward-looking FX rate relationship over the same horizon:

$$SOR = \left[\frac{F}{S} \cdot \left(1 + \frac{USDLIBOR \cdot days}{360} \right) - 1 \right] \cdot \frac{365}{days}$$

where F is the forward FX rate and S is the spot FX rate.

Fallback Rate (SOR) involves adapting the SOR methodology to account for the absence of an upfront USD LIBOR fixing but it continues to use a forward-looking FX rate relationship. In particular, as per the below formulation, it replaces the forward-looking USD LIBOR rate with a backward-looking SOFR-based rate, such that Fallback Rate (SOR) is only known in arrears:

$$Fallback Rate (SOR) = \left[\frac{F}{S} \cdot \left(1 + \frac{USDfbSOFR \cdot days}{360} \right) - 1 \right] \cdot \frac{365}{days}$$

This key difference has dramatic **risk management consequences**, although these do not apply in respect of contract periods while they remain wholly projected as is the case now. The consequences specifically relate to an “in-accrual” period that relies on Fallback Rate (SOR), namely:

- The continued use of a forward-looking FX rate serves to fix the SGD Notional at the start of each accrual period on which a yet-to-be-finalised SOFR interest rate is to be accrued.
- Since SOFR is an interest rate that applies to USD-denominated deposits, this out-of-context use gives rise to non-linear risks which were not present in the original SOR contract and require complex financial models to evaluate accurately. In particular, Fallback Rate (SOR) will not be known until the end of the period, and will be dependent on the correlation between USD interest rates and the SGD/USD FX rate.
- Such valuation models are not in use at LCH, and the arrangements may in our view impair our current risk management and default management capabilities.

Since these novel risks are specific to “in-accrual” coupon periods, **they do not adversely affect LCH’s current ability to accurately and reliably risk manage SOR risk** (since all affected interest periods remain well in the future and can be projected using prevailing techniques and technologies). In addition, there are **operational and technological considerations** to take into account.

Based on these observations, support for SOR products once Fallback Rate (SOR) is in active use lies outside the current scope of LCH's risk and default management framework. In the absence of action from LCH, Fallback Rate (SOR) would be in active use in Phase 2. Since LCH reserves the right to consider whether any Definition would be viable on operational, technological, legal or risk management grounds¹⁰, we need to find a solution that avoids their active use.

Prevailing Fallback Arrangements for LCH-cleared SOR contracts

As noted above, LCH has used ISDA's fallback arrangements as a reference point for the conversion processes it has performed to date. We wish to continue to do so, not least to retain alignment between the outcome of SOR transition for cleared and non-cleared swaps. The fallback from SOR to Fallback Rate (SOR), and then from Fallback Rate (SOR) to the MAS Recommended Rate creates a useful and important degree of certainty.

Nonetheless, even now that the market has certainty over the methodology for the MAS Recommended Rate, it only comes into effect upon the discontinuation of Fallback Rate (SOR) beyond 31 December 2024.

Implications on SOR contracts cleared at SwapClear

With all this in mind, LCH is consulting with its users on the arrangements it needs to make to deal with the Phase 2 period in which Fallback Rate (SOR) would be required to be in active use from July 2023 to December 2024.

As stated above, LCH is not able for operational and risk management reasons to implement Fallback Rate (SOR) as an operative rate in relation to the current coupon period of a SOR contract. The first date on which LCH would be exposed to this risk would be for periods that rely on fixings subsequent to 30 June 2023. Therefore, by this date, LCH must have eliminated this risk from all of its cleared contracts. To do so, LCH considers there to be two potential solutions:

- (1) termination of all SOR contracts; or
- (2) amendment of all SOR contracts such that they are no longer reliant on SOR and instead carry an alternative floating rate option as their contractual reference.

Having assessed the impact of both solutions from our own perspective, LCH believes that solution (2) (a conversion process) has a number of advantages which justify the additional complications. Of these, the greater degree of positional continuity under a conversion solution appears to be the most compelling. Nonetheless, we believe it is necessary to consult on both options with our participants.

Under solution (1), LCH would terminate all SOR contracts outstanding as of a given date at their prevailing market value. Following settlement of a final cycle of variation margin exchanges facilitated by LCH, all SOR contracts would be terminated, with the return of any initial margin associated with them. Parties may be free to re-establish their positions bilaterally, but LCH would not have jurisdiction over such a process. From this date forward, SOR contracts would no longer be eligible for clearing at LCH.

Under solution (2), LCH would convert every SOR contract outstanding as of a given date into a SORA contract, under specified terms to be agreed. As in previous processes, LCH would seek to determine the specifications of such a conversion on a predictable, transparent and standardised basis which would be published as far in

¹⁰ [*LCH's position in respect of ISDA's recommended Benchmark Fallback Approaches | LCH Group*](#)

advance of conversion as is possible. SwapClear believes there is a leading candidate among potential methodologies for conversion, which we set out below.

Potential Conversion Methodology

As noted above, SC-STC has recently published the outcome of its consultation on the potential methodology for a MAS Recommended Rate. The MAS-RR that has been confirmed is the right baseline to use for valuing Phase 3 of SOR contracts ahead of a conversion, noting that this is based on SORA. LCH has recent experience of performing large-scale contractual conversions, for example the conversion of non-USD LIBOR contracts into their RFR equivalents in late 2021. Critically in these processes, based on a binding economic relationship between the prevailing (outgoing) benchmark and the incoming benchmark into which the contracts were converted, it was possible for LCH to perform the conversion with a mechanism to preserve NPV-neutrality from LCH's perspective. This NPV-neutrality allowed for a divergence, within small tolerances, between the projected cashflows on the original contract *under fallbacks* ("Input Contract") and those on the amended contract ("Output Contract"). This divergence was compensated with the incorporation of an associated upfront cash amount at a trade level. The proposed relationship between the Input Contracts and Output Contracts, and therefore the source of the cash compensation, is detailed in Appendix 1.

We believe that an equivalent method could be developed and implemented successfully to deal with Phase 1 and Phase 3 of SOR swap contracts. For Phase 1, we would propose the use of overlays bookings as deployed in prior conversion events. For Phase 3, the fact that the MAS Recommended Rate is now confirmed to provide a binding economic relationship to SORA allows the full specification of a deliverable conversion methodology¹¹.

Now that a binding economic relationship has been established for Phase 3 via fallback arrangements into MAS-RR, we propose to use the Phase 3 coupon structure of the Output Contracts (per Appendix 1) also in Phase 2. Therefore, the main open question in respect of Phase 2 is this: what market data and methodology should be used to value the Input Contract during Phase 2? To this end, we propose to source a robust SOR curve to determine a value of the Input Contracts. For more specific details of the proposed Input Contract Valuation Methodology, please see Appendix 2.

The creation of this Input Contract Valuation Methodology provides a bridge between contractual periods for which a representative SOR is available (Phase 1), and those for which a SORA-based fallback is available (Phase 3). LCH performs valuations of all its SOR and SORA contracts no less than daily, and believes that this proposed methodology can be designed, developed and deployed in the available time.

The approach to valuing the Input Contracts outlined in Appendix 2 provides a number of benefits:

1. it provides consistency with other completed conversion processes, such as those used for GBP/EUR/CHF/JPY LIBOR conversions, as well as with the process now finalised for USD LIBOR conversion, should market participants favour conversion over termination;
2. it maximises consistency in the run-up to with ongoing daily processes in respect of outstanding SOR contracts, such as variation margining against the prevailing SOR curve;

¹¹ As communicated via a *member circular* issued on 18 March 2021, LCH's approach of converting CHF, EUR, GBP and JPY LIBOR contracts into corresponding RFR-based contracts entailed the following key features: i) all cleared LIBOR trades that were outstanding shortly before their confirmed cessation date(s) were converted into contracts with market-standard OIS legs; ii) the LIBOR floating rate was replaced by the relevant compounded RFR plus a non-compounded spread adjustment; iii) LCH cash compensated for any valuation difference between the original LIBOR trade and the new RFR contract; iv) Replication of the economics of the original trade as closely as possible; and v) LIBOR coupons with all LIBOR fixings occurring between conversion date and permanent cessation date were preserved.

3. it accounts for potential declines in SOR swap market liquidity, and corresponding concerns about market representativeness, by adding additional governance steps relating to price submissions but without requiring SOR trade execution.

Request for Feedback

The process put forward in this consultation aims to provide a robust, transparent and standardized outcome for LCH-cleared SGD SOR contracts that remain outstanding at or shortly before 30 June 2023. LCH must apply it consistently to all relevant SOR contracts and cannot provide for any optionality at trade or account level. Customers needing or wanting a tailored approach, either at account level or for individual contracts, should make their own arrangements. In coherence with other LIBOR conversion events, LCH encourages pro-active transition of customers' SOR trade populations ahead of LCH's conversion process and believes that providing clarity and certainty over these back-stop arrangements will assist SwapClear participants with their prioritization and planning.

As with LCH's LIBOR conversion processes, there is likely to be a charge for any trades subject to it. These pricing structures will be part of a separate communication in due course.

We strongly encourage SwapClear participants to respond to this consultation and to express their opinion in order that LCH has the widest set of feedback on which to determine how to proceed. LCH will support this consultation with briefings and with additional materials as required. Please contact your LCH Sales & Relationship manager should you require further information about these.

To participate in this consultation, please reply to SORConversion@lseg.com and we will send you a link to complete the on-line survey by Friday 9 September 2022. Individual responses received by this date will be kept CONFIDENTIAL and will be considered by LCH in determining which approach should be adopted. Any responses received after this date may not be considered. Implementation of any proposal is subject to ongoing legal review, regulatory approval and risk governance and may be subject to further change.

Consultation Questions

1. Given LCH's inability to manage the risks associated with allowing Fallback Rate (SOR) to be in active use, would you prefer that:
 - a. LCH terminate all LCH-cleared SOR contracts outstanding as of a SOR Termination Date to be determined but no later than 30 June 2023 at their prevailing market value as determined by LCH; or
 - b. LCH convert all LCH-cleared SOR contracts outstanding as of a SOR Conversion Date to be determined but no later than 30 June 2023 into SORA contracts using a transparent and predictable relationship between each original input SOR contract and its corresponding output SORA contract, together with cash compensation determined by LCH?
2. In the event that the outcome of this consultation is that LCH adopts option 1.(b) above, and noting that the formulation of the MAS Recommended Rate has been made available, do you agree with LCH's proposal to use it as the economic basis for conversion against which the contribution to total cash compensation would be calculated and exchanged by LCH in relation to all contractual periods during Phase 3?
3. Assuming that market participants **can** rely on the availability of Fallback Rate (SOR) up to and including 31 December 2024, do you agree with LCH's proposal to use the Input Contract Valuation Methodology and Required Market Data Sets as set out in Appendix 2 to determine the termination amount applicable in final settlement of all SOR Contracts terminated in the process (under option 1.(a)) or the contribution to total cash compensation from SOR Contracts converted in the process (under option 1.(b))? If not, please provide an alternative solution and your reasons for preferring it.
4. In the event that the outcome of this consultation is that LCH adopts option 1.(b) above, and noting that the formulation of the MAS Recommended Rate has been made available, do you agree with LCH's proposal to use its central specifications, such as a spread adjustment, as the basis for the Market-Standard SORA OIS to be created as Output Contracts of the conversion process?
5. In the event that the outcome of this consultation is that LCH adopts either option 1.(a) or 1.(b) above, LCH believes that a SOR Termination Date or SOR Conversion Date of Friday 9th June 2023 would be suitable. Do you have any objections to the use of this date? If so, what are your objections?

Appendix 1

Trade attribute, FLT leg	Typical SOR IRS, inc. ISDA fallbacks (Input Contract)	SORA OIS, generic market trading	Market-Standard SORA OIS (Output Contract)	Rationale for Output Contract attribute
Floating Rate Option (FRO)	SGD-SOR	SGD-SORA-OIS Compound	SGD-SORA-OIS Compound	Cessation of SGD-SOR
Floating Rate Spread	None vs SOR, but implicit to SORA via fallbacks	None	Adjustment Spread (as set within MAS-RR)	Ongoing cashflow & NPV alignment vs Input Contract
Interest Period Frequency	1M, 3M, 6M	Annual	Inherited from the Input Contract	Respects Input Contract frequency
Payment Frequency	Aligned with Interest Period Frequency*	Annual	Inherited from the Input Contract	Respects Input Contract frequency
Payment lag	Zero	2 SGSI business days	2 SGSI business days	Preserves Input Contract accrual period
Offset Lag ¹²	2 (creates effective 2D backward shift vs SOR Interest Period)	n/a (zero)	n/a (zero)	Respects Input Contract Interest Periods
Effective Date	Deal specific	Deal specific	Inherited from the Input Contract	Respects Input Contract terms
Termination Date	Deal specific	Deal specific	Inherited from the Input Contract	Respects Input Contract terms

*Contracts with regular periodic compounding will have a Payment Frequency that differs from the Interest Period Frequency. We propose to handle this scenario as set out more fully below.

¹² Offset Lag is a term in the IBOR Fallback Rate Adjustments Rulebook. It defines a complicating but necessary offset between each accrual period in the original SOR contract and the corresponding observation period for SORA compounding towards each Adjusted Reference Rate / Fallback Rate when operating under fallbacks. A non-zero Offset Lag creates SORA trades which would not be fungible with contracts that are traded with SORA as their original FRO.

Appendix 2

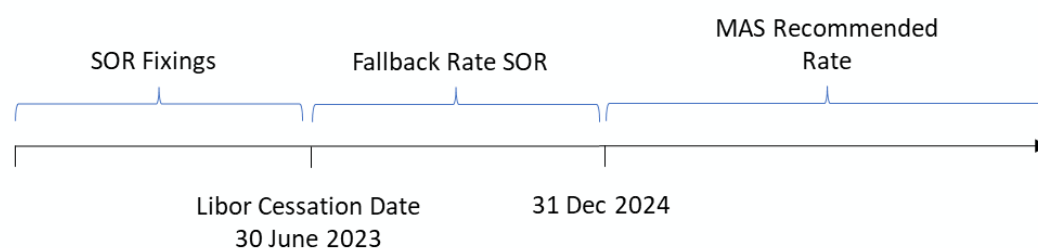
Input Contract Valuation Methodology and Cash Compensation

This methodology involves determining a transparent and predictable *ex ante* approach to valuation of SOR-based Input Contracts, and under conversion allows the determination of trade-level cash compensation between this valuation and the Phase 2 coupon structure of the Output Contracts.

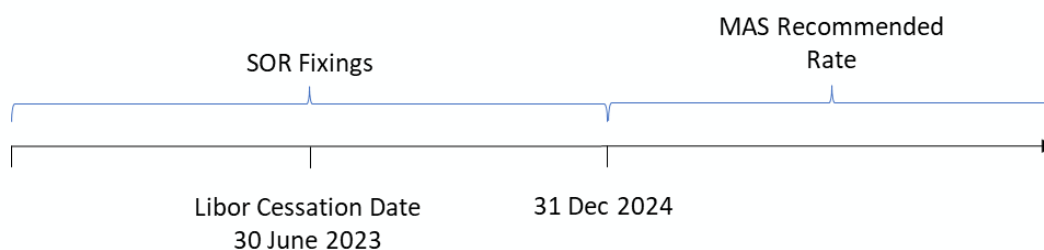
LCH is intending to leverage the same approach to valuation/cash compensation for SGD SOR contracts as that used for the GBP/EUR/JPY/CHF LIBOR conversion process that occurred at the end of 2021, and that *will be* used for conversion of USD contracts in Q2 2023. Under this approach, cash compensation amounts are calculated as the change in NPV between the pre-conversion SGD SOR trade and its post-conversion SGD SORA replacement, both computed as of EOD on the Friday immediately preceding to the conversion weekend.

For the December 2021 LIBOR conversions, this approach resulted in small compensation amounts for vanilla swaps, as the LIBOR projections (based on the fallback curve) were in line with the RFR equivalent output trade cashflows received out of the conversion process, other than for minor differences (e.g. observation/payment date variances).

For SGD SOR this may not be the case. Where the LIBOR projections used in the prior conversion process were a blend of 2 curves (LIBOR curve used up to the cessation date and the fallback curve methodology post cessation), SGD SOR cashflow projections is made up of 3 parts as follows:



LCH is proposing to use SOR curve cashflow projections for Phase 1 and Phase 2 (up to 31 Dec 24) of the curve. Note that the use of overlays for Phase 1 SOR fixings neutralises any NPV difference from their projection. For Phase 2, whilst there are other ways to recreate ISDA's fallback curve projection methodology, LCH believes it to be a better approach given the complexities of Fallback SOR and the fact that SOR contracts, and therefore SOR curve inputs, embed the relevant market information relating to Fallback Rate (SOR) for periods from SOR's cessation date up to and including 31 December 2024. Using this approach, the proposed curve would be made up of 2 parts as follows:



The curve construction will require 2 curves to be sourced, and similar to the conversions performed last year, will result in a split curve underpinning the generation of the correct forward rates. Explicitly this means:

- Phases 1 & 2: where the fixing date of a SOR trade cashflow is no later than 31st December 2024 then LCH propose to use the legacy SOR curve sourced as outlined below.
- Phase 3: where the publication date of the Fallback Rate (SOR) rate applicable for the interest period on the original SOR contract would be later than 31st December 2024, then LCH propose to use the SORA curve built from the Phase 3 Market Data Set as defined below to generate the forward MAS Recommended Rates which would drive payments at that stage of the contract.

The fixed side of any trade is unaffected by conversion, as in prior processes.

Required Market Data Sets

LCH is intending to source all required market data at 9am London time on the conversion day as follows:

Phase 1 & Phase 2 SOR Market Data Set

The SOR component of the valuation curve (required for projections relating to fixing dates up to and including 31 December 2024) will be built using bid/offer SOR/SORA basis swap quotes submitted directly to LCH at 0900 London time on the Friday immediately preceding the conversion date. These quotes will then be used to generate mid prices and will form the official SwapClear close of business curves for the day as published on REPO0099. They will be used to determine all cash compensation amounts (or termination amounts, as applicable) for members and clients. The submissions received will be used to calculate the Mid Prices as follows:

Mid Price Determination Process

This process is used to generate robust prices from which to derive the cash compensation amounts (or termination amounts, as applicable). To ensure the quality of this information, the submissions will go through a cleaning process, described below.

Major SGD SOR swap market participants will be required to submit non-executable bid/offer SOR/SORA basis swap quotes for all Required Products and Required Tenors in representative market sizes. LCH will determine and publish qualification criteria for such market participants in consultation with the industry in the coming months.

For each Required Tenor of each Required Product, LCH will rank the bids of all submitting parties from the highest to the lowest and will rank the offers of all submitting parties from the lowest to the highest. Having done so, LCH will exclude any crossing price submissions, i.e. individual participant bids that are higher than another participant's offer (and vice versa).

The Mid Price for each Required Tenor of each Required Product will be the average of the highest quarter of bids and lowest quarter of offers from the quotes remaining. The number of bids in this calculation will be rounded up to the nearest whole number, e.g. if there are five bids left after removing the crossing bids, the average of the best two will be used for the auction mid calculation.

Given the importance of this set of Mid Prices and to further ensure the quality of the curve, LCH may be required to disclose the submissions to relevant official sector bodies.

Required Products and Required Tenors to be submitted are:

Product type	Basis Swap	Basis Swap	Basis Swap
Floating Leg 1 FRO	SGD SORA	SGD SORA	SGD SORA

Floating Leg 1 Payment Frequency	1Y	1Y	1Y
Floating Leg 2 FRO	SGD SOR, 1M	SGD SOR, 3M	SGD SOR, 6M
Floating Leg 2 Payment Frequency	1M	3M	6M
DayCount Fraction	ACT/365, both legs	ACT/365, both legs	ACT/365, both legs
Price Quotation	Leg 1 Spread	Leg 1 Spread	Leg 1 Spread
Required Tenors	1Y, 2Y, 3Y, 4Y, 5Y	1Y, 2Y, 3Y, 4Y, 5Y	1Y, 2Y, 3Y, 4Y, 5Y

Phase 3 SORA Market Data Set

The MAS Recommended Rate (required 1 Jan 2025 onwards) will be calculated as determined by the methodology set out in the outcome to the recent SC-STC consultation. The SORA component of the MAS-RR will be captured at 0900 London time in line with existing LCH procedures and shown on REP0099. We note that, as with prior conversion processes, we propose to use common SORA projections to project both (i) MAS-RR applicable to the original contract and (ii) the Market-Standard SORA OIS generated as an Output Contract.