Executive Summary

In the Singapore Wholesale Electricity Market, market participants (MPs) may enter into bilateral contracts and authorize the EMC to settle only the net credit or debit after taking the bilateral quantities into consideration.

A review of the current bilateral contract arrangement in this paper has shown that it is largely designed for a market structure of predominantly gentailers. As the market make-up evolves, the bilateral contract arrangement naturally needs to be enhanced to ensure that it remains a relevant and practical tool for the market. Credit risks associated with bilateral contract settlement need to be assessed and monitored closely as well.

We have identified several issues with the current arrangement and analysed the following six potential enhancements to the current bilateral contract arrangement in this paper:

1. for the buyer to be notified by the EMC of the seller-submitted bilateral contract data;
2. for the EMC to validate the seller’s actual generation or credit support level, or both, against a) the bilateral contract submission and b) settlement; specifically,
   - a) for the seller’s bilateral contract submission to be validated and accepted only if its contract position can be sufficiently covered by its actual generation or credit support level, or both; and
   - b) for the seller to be required to make prepayment of its negative preliminary settlement statement amount within 2 business days if such exposure is not covered by its credit support held with the EMC.
3. to introduce Wholesale Electricity Price settlement and strike price settlement as new settlement mechanisms for bilateral contracts;
4. to allow bilateral contracts to be used for ex-post trade reallocation in the event of a buyer’s margin call;
to allow the expected bilateral settlement amount to be subtracted from the initial credit support requirement calculation for new MPs that have entered into bilateral contracts as buyers; and

for the timeline for submission of bilateral contract data to be updated to T-15 calendar days to accommodate the Retail of Last Resort timeline.

At the 119th RCP meeting, the RCP

- **unanimously supported** Proposals 1 and 6; and
- by majority vote **supported** Proposals 2, 3, 4 and 5,
and tasked the EMC to draft the relevant rule modifications.
1. Introduction

In the Singapore Wholesale Electricity Market (SWEM), market participants (MPs) may enter into bilateral contracts and authorize the EMC to settle only the net credit or debit after taking the bilateral quantities into consideration (“net settlement”). Bilateral contract settlement is available for all the three products in the SWEM, namely, energy, reserve\(^1\) and regulation.

This paper reviewed the bilateral contract arrangement in the current market rules and proposed enhancements to it.

2. Background

2.1 Overview of bilateral contract arrangement in SWEM

In electricity markets, a contract for difference (CfD) is one of the most commonly used tools to manage spot price risks. By agreeing to a fixed price (the “strike price”) for a fixed quantity (the “contract quantity”) of electric energy or other ancillary products, the parties to the CfD are shielded from wholesale market price volatilities for the contracted quantity. In the context of the SWEM, such CfDs are termed as bilateral contracts.

Since inception, the SWEM has predominantly been comprised of a few large generation companies (“gencos”) and their affiliated retail companies (“gentailers”). All bilateral contracts have been energy quantity offsets between gencos and their affiliated gentailers. Although the market rules provide for settlement of bilateral reserve contracts and bilateral regulation contracts, they have never been used. This paper focuses predominantly on a discussion on bilateral energy contracts.

There is a similar regulatory contractual arrangement in the SWEM, namely the vesting contract, between some gencos and the market support services licensee (MSSL). For the avoidance of doubt, vesting contract is not considered in this study.

Our study of SWEM data from January 2019 to May 2020 showed that on average, the bilateral energy contract level and vesting contract level were about 65% and 18% of the total withdrawal quantities respectively.

2.2 Current bilateral contract arrangement

2.2.1 Submission of bilateral contract information to EMC

a. The seller of a bilateral contract is the party responsible to submit the contract to the EMC for settlement.

b. The buyer’s settlement account needs to be specified during the submission.

c. The buyer is neither notified of nor required to verify the submission of the seller.

d. Submission must be at least ten days before the dispatch day to which the bilateral contract data apply.

e. Only contract quantity is submitted to the EMC. The strike price is not required. For bilateral energy contracts, the contract quantity can be in one of three forms: (i) percentage of Injection Energy Quantity (IEQ) of seller, (ii) percentage of Withdrawal Energy Quantity (WEQ) of buyer, or (iii) absolute quantity in MWh. For bilateral reserve and regulation contracts, the contract quantity must be in absolute MWh quantity.

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\(^1\) In the reserve market, reserve product is further differentiated by reserve provider groups associated with each reserve class. Therefore, a bilateral reserve contract needs to be associated to a specific reserve provider group.
2.2.2 Settlement of bilateral contract information

While parties to a bilateral contract would typically agree on a specific strike price as the basis for settlement, the EMC’s net settlement only “partially” settles the contract in the sense that the contract quantities are settled using floating market prices. Specifically, bilateral energy quantities (BEQ), bilateral reserve quantities (BRQ) and bilateral regulation quantities (BFQ) are settled using the uniform Singapore energy price (USEP), the market reserve price (MRP) of the associated reserve provider group and market regulation price (MFP) respectively.

Figure 1 below illustrates the effect of bilateral energy contract settlement by the EMC. It is assumed that the seller has generated 200MWh with its nodal price being $95/MWh, the buyer has consumed 150MWh with USEP being $100/MWh and the seller submits the bilateral energy contract to the EMC for settlement with BEQ being an absolute quantity of 100MWh.

2.3 Benefits of bilateral contract settlement by EMC

- Avoid circular cash flow

Note that the EMC may not be able to “fully” settle the bilateral contract since the agreed contract price might not be equal to the USEP that the EMC uses for contract settlement. For illustrative purposes, assuming the actual contract price is $110/MWh in the worked example in Figure 1, the seller needs to additionally compensate the buyer $1,000 (100MWh x $10/MWh) after the EMC has netted the bilateral contract amount in settlement.

Despite the need for out-of-market settlement for the residual difference in price, bulk of the circular cash flow has been avoided.

- Lower financing cost and improved cash flow of the buyer

To fulfill its daily market settlement requirement, the buyer only needs to maintain enough float in its bank account to cover the net amount it owes the market.

In addition, lower credit support level is required from the buyer as its trading exposure decreases. In the worked example, the credit support value (CSV) required from the buyer would be about $570,000 ($15,000 x 38 days) without net settlement; with reduced trading exposure due to net settlement, its CSV decreases substantially to about $190,000 ($5,000 x 38 days).

- Lower settlement risk and smaller share of default levy (if any)

In the event of a settlement shortfall due to an MP’s default in payment, all the non-defaulting MPs share the shortfall amount in proportion to their respective invoice amounts. Net settlement reduces the invoice value of both the seller and the buyer in absolute terms, and consequently results in smaller shares of default levy for both the seller and the buyer of the bilateral contract.
Even if the buyer of the bilateral contract is the party in default, the seller’s proportional share of the default levy is still lower due to the effect of net settlement. For illustrative purposes, assuming the sum of the invoice value of the rest of the market is $200,000, the seller’s share of default levy would be 8.7% ($19,000 ÷ $219,000) without net settlement and 4.3% ($9,000 ÷ $209,000) with net settlement.

3. Issue Analysis and Proposed Enhancements

3.1 Lack of buyer verification of seller’s submission

In accordance with the current bilateral contract arrangement, as summarised in Section 2.2 of this paper, the seller is wholly responsible for the submission of bilateral contract data. The buyer is not informed by the EMC of the submission, until the buyer receives its preliminary settlement invoice that reflects the net settlement. Even if the seller lodges an erroneous submission that is different from the contract, the buyer does not get to verify or rectify the submission with the EMC.

Despite this rigidity, the arrangement has worked fine since parties to bilateral contracts in the SWEM are usually pairs of affiliated gencos and gentailers. However, as the market evolves with emergent new business models and technologies, enhancements to the current arrangement is necessary to expand its applicability and to facilitate participation of new models.

- Example 1 - Bilateral contracts between parties that are unaffiliated

As the generation market becomes increasingly diversified with entry of new “gencos” such as solar and energy storage system developers, independent retailers may be able to secure a bilateral contract with an unaffiliated genco. Having a mechanism that allows the buyer to be able to verify the seller’s submission of bilateral contracts will significantly boost the buyer’s confidence in settlement certainty. The buyer’s validation also minimizes human errors in data input from the seller, therefore reducing the need for private settlement adjustments between the two parties.

- Example 2 – MPs having bilateral contracts with multiple parties

If a retailer has entered into several bilateral contracts with different sellers in respect of the same trading period, its settlement invoice does not provide the breakdown of individual bilateral contract amounts but only shows the total sum. The buyer will not be able to accurately reconcile its net settlement amount if it is not informed of the individual submissions by all the sellers that it has contracted with.

During industry consultation, selling MPs are generally concerned about potential delays or blocking from buying MPs, especially if the contract submission is a downward revision of contract quantities and the buying MP is required to verify the submission in the system before the EMC accepts it. On the other hand, having the buyer notified of the seller’s submission would suffice to rectify the current information asymmetry. It is not critically important for the buyer to verify and agree to the seller’s submission. If the buyer finds any error in the seller’s submission, it can inform the seller to correct the submission or privately settle the differences due to the error.

Therefore, we propose that the buyer be notified by the EMC of any bilateral contract data submission to which the buyer is a party. The buyer is not required to verify the submission.

Proposal 1: we propose that the buyer be notified by the EMC of the seller’s submission of bilateral contract data.
3.2 Credit risk associated with bilateral contract settlement

In the securities and commodities markets, CfD is purely a financial contract that is cash-settled. The seller who shorts a CfD is not required to own (or have borrowed) the underlying product to ensure physical delivery upon settlement but needs to maintain an adequate margin with its broker.

Credit risk management in the SWEM revolves around monitoring prudential requirements and mitigation of payment default risk of market debtors. Sellers of bilateral contracts, typically being gencos with generation assets to physically deliver the contract quantity, do not maintain credit supports with the EMC. However, when the EMC settles a bilateral contract, the buyer’s debit is transferred to the seller and the seller may become a net debitor if the seller’s actual generation is less than its contracted short position.

3.2.1 Failure-to-deliver by gencos

The nature of the current bilateral contract settlement in the SWEM is purely financial. For example, in the event where due to generation outage, a genco is unable to deliver the contract quantity physically in real-time, the EMC would still proceed to execute the net settlement in accordance with the seller’s ex-ante submission of bilateral contract data. In addition, the seller is not allowed to modify its submission close to real-time as the market rules require the bilateral contract data to be submitted at least 10 days prior to the trading day.

From January 2019 to May 2020, MPs predominantly submit bilateral energy contracts in the form of a percentage of the buyer’s WEQ. About 85% of these submissions specified the percentage as 100%. This is consistent with our general understanding of how bilateral contract arrangement is currently used by the MPs – by gencos and their affiliated gentailers to offset the gentailer’s exposure entirely by the genco’s physical generation.

As a result, if the genco fails to deliver at least its affiliated gentailer’s WEQ, the genco can temporarily be in a debit position. Since gencos, being market creditors for most of the time, are not required to maintain credit support with the EMC, their uncovered debit position posts potential credit risk to the market, more so if the debit position becomes prolonged.

To mitigate credit risk associated with the current bilateral contract settlement, we propose the following modifications in the prudential requirements and bilateral contract arrangement in the SWEM:

a. Prior to contract data submission

The seller should self-assess its expected generation output vis-à-vis its contract position on an ongoing basis. If the seller expects its generation to fall short of its contract position, it should provide sufficient credit support to cover its expected net short position prior to submission of the relevant bilateral contract data.

b. EMC’s verification of submission

Prior to accepting the bilateral contract submission made by the seller, the EMC shall first verify if the seller’s contract position poses uncovered trading exposure in the market. Specifically, the estimated credit amount to be transferred to the buyer (BESC) shall be evaluated against the sum of the seller’s expected revenue from energy generation (GESC) and the credit support amount it has provided to the EMC. The verification aims to prevent MPs from taking up excessively significant debit positions (via selling of bilateral contracts) that are beyond the coverage provided by the combination of its physical generation capabilities and its credit support.

2 Except if the Market Surveillance and Compliance Panel (MSCP) instructs the EMC to reject any bilateral contract data submitted by a suspended MP.

3 BESC and GESC in this paper carry the same meaning as defined in Chapter 7 of the market rules.
A worked example

Contract Details
- Contract duration: 6 months
- Contract type: Load (Fraction of WEQ of buyer)
- Bilateral Withdrawal Fraction (BWF): 100%
- Contract price used for settlement: USEP

Estimated daily BESC amount
- Contract quantity of each period is estimated using the 90-day rolling average of buyer’s historical WEQ in that period, denoted by BEQh;
- Contract price of each period is estimated using the 90-day rolling average of historical USEP in that period, denoted by USEPh;
- Estimated daily BESC amount could be calculated by summing the products of BEQh and USEPh over all 48 periods in a trading day, denoted by BESCd.

Estimated daily GESC amount
- Daily GESC amount can be estimated using the 90-day rolling average of seller’s historical GESC, denoted by GESCd.

EMC’s Verification
Suppose BESCd = $350,000, GESCd = $300,000 and the seller has additionally pledged $2,000,000 credit support amount with the EMC, its forecasted contract position for 38 days will be $13,300,000 ($350,000 x 38 days) in total which could be sufficiently covered by the sum of its expected generation revenue of $11,400,000 ($300,000 x 38 days) and its credit support amount of $2,000,000, and the seller’s submission of the bilateral contract data can be accepted by the EMC.

c. EMC’s settlement check
Due to generation outages or other unexpected issues in real-time, the seller may not receive enough generation credit compared to the expected daily GESC amount used in Step b. As a result, its BESC may occasionally fall short of its actual GESC, i.e., the amount to be transferred to the buyer is larger than the seller’s actual gross generation revenue.

Option 1: Provision of credit support to cover the shortfall
If the seller has pledged enough credit support to make up for the shortfall between its BESC and GESC, the EMC will continue to settle the bilateral contract in full given that the seller’s debit position is covered. On the other hand, if the seller has not provided or provided insufficient credit support to cover its generation shortfall, the EMC shall settle the bilateral contract only to the extent that the seller’s GESC is exhausted. This is to prevent the seller from going into a debit position without credit support coverage.

While the proposed change in Step b does not mandate sellers of bilateral contracts to provide credit support if their generation capabilities alone could sufficiently cover their contract positions, the settlement check encourages sellers to pledge a reasonable amount of credit support with the EMC for settlement certainty. For example, if the seller expects a planned maintenance of its units to last for two consecutive trading days, credit support amount equivalent to two days of its contract position should be pledged to the EMC so that the EMC continues to settle its bilateral contract fully even when its units are not running.

Option 2: Prepayment of uncovered debit position

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4 By the existing prudential requirements, if an MP starts to default on its payment, it is generally expected to have up to 38 days of trading exposure in the market before its trading activities can be suspended.
We recognize that Option 1 will lead to increased financing cost for gencos and we have also received similar comments from MPs during industry consultation. We would like to propose an alternative approach for consideration – i.e. for the genco to make prepayment of its negative preliminary settlement statement (PSS) amount within 2 business days (BDs) if its credit support (if any) does not cover its PSS amount. This is similar to the existing margin call approach where MPs, if their risk exposure level exceeds the pre-defined threshold, are required to provide additional credit support or make prepayment of its unsettled invoices to satisfy a margin call.

In this alternative proposal, the BESC will continue to be settled in full by the EMC according to the seller’s submission that has been accepted in Step b, regardless of the seller’s actual GESC amount or its credit support level. Any negative PSS amount of the seller, if not covered by its credit support, will have to be pre-paid within 2 BDs. If the seller fails to make such prepayment in time, it will be deemed an event of default and the EMC may, amongst other things, request the MSCP to issue orders such that the EMC is allowed to withhold any other future payments to the seller.

**Option 1 versus Option 2**

We have evaluated the two options from various aspects and present the assessment in Table 1 below. **Option 2 is recommended as it entails lower costs, higher settlement certainty, lower operational complexity, and resolves the more generic issue of gencos’ negative PSS amount.**

<table>
<thead>
<tr>
<th>Table 1: Option 1 versus Option 2</th>
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<tbody>
<tr>
<td><strong>Option 1:</strong> Provision of credit support to cover the shortfall</td>
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<tr>
<td><strong>Costs to sellers</strong></td>
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<tr>
<td>Higher - to meet continuous credit support requirements.</td>
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<td><strong>Settlement certainty</strong></td>
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<tr>
<td><strong>Operational complexity</strong></td>
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<tr>
<td>High – expected changes to multiple settlement-related reports and process.</td>
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<tr>
<td>Limited to resolving issues of insufficient generation compared to contract position.</td>
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<tr>
<td><strong>Effectiveness in managing risk</strong></td>
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<tr>
<td>Higher – but the risk is merely transferred to the buyer.</td>
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3.2.2 Financial trading via bilateral contract

We further expanded the scope of our analysis and studied the prospects of financial trading via the existing bilateral contract arrangement in the SWEM.

Retailers in the SWEM currently finance their credit support requirements by providing cash, Banker’s Guarantee (BG) or Standby Letter of Credit (SBLC) to the EMC. The associated financing cost can be proxied by the commercial loan rate or the bank charges for issuing BG or SBLC respectively. Although a BG or SBLC generally costs less as its bank charges are typically lower than the prevailing commercial loan rate, small businesses may face difficulties in obtaining

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5 While the market rules stipulate that the Singapore Government Treasury Bills are acceptable form of credit support, they are not currently used by any MP.
one. We observed that smaller-sized independent retailers in the SWEM usually provide credit support in the form of cash.

Tools for hedging spot price volatility in the SWEM are limited as well, especially for independent retailers. Gentailers backed by physical generation assets have a natural hedge that independent retailers do not. Electricity futures⁶ are often used as a hedging tool to lock in forward prices. However, unlike bilateral contracts, prudential requirements and settlement of futures contracts are governed by the Securities and Futures Act (Cap. 289) and administered by the financial exchange. As a result, a retailer’s futures position neither lowers its credit support requirement nor reduces its settlement amount in the SWEM.

By recognizing that bilateral contracts can be purely financial, without the backing of generation assets, to provide more flexibility for settlement reallocation, the market can evolve with new business models and hedging options such as:

- financial traders being sellers of bilateral contracts,
- bilateral contracts between retailers for their over- or under-contracted positions,
- margin call satisfied by trade reallocation, and
- offset of futures positions in the SWEM settlement.

These innovations can encourage more competition in the market by providing more options for trade financing and price risk hedging for MPs. Retailers can potentially enjoy lower financing cost which can in turn flow to end consumers of electricity through lower energy prices.

Our study of other jurisdictions also showed that bilateral contracts in energy markets are generally treated as financial products for trade reallocation. Ontario’s Independent Electricity System Operator (IESO) explicitly allows parties without physical assets to sell bilateral contracts⁷; the Australian Energy Market Operator (AEMO) supports trade reallocations that are based either on contract quantity, or on value in an agreed dollar amount⁸.

For sellers of bilateral contracts who do not own generation assets in the market, credit risk management becomes more critical. A similar arrangement proposed in Section 3.2.1 could be adopted such that sellers are required to provide sufficient credit support to cover their contract position before bilateral contract data submitted can be accepted by the EMC.

**Proposal 2:** we propose that the EMC validates the seller’s actual generation or credit support level, or both, against its bilateral contract submission and settlement. Specifically,

- **Proposal 2a:** for the seller’s bilateral contract submission to be validated and accepted only if its contract position can be sufficiently covered by its actual generation or credit support level, or both; and

- **Proposal 2b:** (Option 2) for the seller to be required to make prepayment of its negative PSS amount within 2 BDs if such exposure is not covered by its credit support held with the EMC.

### 3.3 Is there value in providing different forms of bilateral contract settlement?

The strike price is commercially sensitive and currently not submitted to the EMC. EMC uses market prices for bilateral contract settlement. As discussed in Section 2.3 of this paper, this leads to “partial” settlement of a bilateral contract due to the difference between strike price and the market price used by the EMC for settlement. Parties to the contract must take additional steps

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⁶ Refers to the SGX USEP Quarterly Base Load Electricity Futures and the SGX USEP Monthly Base Load Electricity Futures traded on the Singapore Exchange (SGX)


to settle the residual difference out-of-market. In rare events that the market price clear at negative values, the existing settlement arrangement reallocates “negative credit” from the seller to the buyer, which might contravene the intent of bilateral contracts in the context of electricity markets.

To minimise the transaction costs of off-market settlement for MPs and provide more flexibility to suit different business needs, we consulted industry players and would like to propose to introduce the following new options in the settlement arrangement:

(i) WEP settlement – besides USEP, the Wholesale Electricity Price (WEP)⁹ can be nominated as the contract price for settlement; or

(ii) strike price settlement - the seller can choose to provide the strike price associated with the contract quantity.

For Option (ii), a reasonable price band should be prescribed for the strike price to avoid fraudulent credit transfers. Our initial assessment is that the price floor should be set at zero to prevent negative credit transfer, and the price ceiling could be pegged to a multiple of historical average of market prices, for example, 2 times of the average USEP in the preceding year.

For all options for contract settlement, it is important to ensure that the amount of credit transfer does not exceed the coverage provided by the seller’s generation capability or pledged credit support amount.

Proposal 3: we propose to introduce WEP settlement and strike price settlement as new settlement mechanisms for bilateral contracts.

3.4 Use of ex-post trade reallocation to meet margin calls

A margin call issued to an MP must be satisfied within 2 BDs by making pre-payment or providing additional credit support. Given the tight timeline, MPs often have to fork out the amount required in cash and it can be challenging for MPs without short-term cash flow flexibility. One enhancement we propose is to allow the bilateral contract arrangement to be used for ex-post trade reallocation in the event of a buyer’s margin call.

Specifically, in the event of a margin call, the MP (“buyer”) has the option to negotiate a bilateral contract with another MP (“seller”) to offset its traded positions in order to bring its risk exposure down to the required level. The seller needs to submit the bilateral contract data to the EMC in accordance with the margin call timeline given by the EMC to the buyer. The arrangement works like a “pre-payment” in the form of another MP’s credit instead of cash, at a potentially lower cost.

Proposal 4: we propose to allow bilateral contracts to be used for ex-post trade reallocation in the event of a buyer’s margin call.

3.5 Initial credit support value calculation to include bilateral contract offsets

MPs’ credit support requirements are estimated using the rolling 90-day average of their settlement invoices. Bilateral contracts reduce their credit support requirement by decreasing their daily settlement amounts that are used for prudential calculation. For a new MP with fewer than 90 days of trade in the SWEM, its credit support requirement is calculated using a more prudent approach which takes the product of historical average market price and the maximum of all historical WEQs and its forecasted WEQ. The calculation for a new MP has not considered the case where that new MP has entered into bilateral contract(s) that can reduce its wholesale trading exposure as well as credit support requirement.

Proposal 5: to accurately reflect a new MP’s credit risk in the market, we propose that the expected bilateral settlement amount to be subtracted from the initial credit support requirement calculation for new MPs that have entered into bilateral contracts as buyers.

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⁹ WEP (in $/MWh) is the sum of USEP, energy uplift charges, regulation charges, EMC and PSO fees.
3.6 Inclusion of RoLR timeline in the submission of bilateral contract

To prevent sellers of bilateral contracts from revising contracted quantities upon the buyer’s payment default in the SWEM, rule modifications introduced in RC 341: Review of Mechanisms to Mitigate Credit Default\textsuperscript{10} updated the timeline for submission of bilateral contract data from T+4BD to T-10 calendar days, T being the trading day to which the bilateral contract data apply. The analysis in RC341 was undertaken by the EMC in 2017 prior to the introduction of the Retail of Last Resort (RoLR) framework in preparation for the launch of Open Electricity Market. As a result, the updated timeline did not take the RoLR timeline into consideration. It was set at T-10 calendar days on the basis that a defaulting retailer is expected to be suspended from trading within 6 BDs from its default in payment.

The RoLR timeline entails 3 BDs for completion of customer transfers of the defaulting retailer upon the MSCP issuing a suspension order. Rule modifications introduced in RC 359: Review of Credit Support Requirements in Alignment with the Lead Time for Transfers During a Retailer of Last Resort Event\textsuperscript{11} increased the prudential requirements in accordance with the extended suspension process timeline accommodating the RoLR framework.

Proposal 6: we propose that the timeline for submission of bilateral contract data be updated to T-15 calendar days to accommodate the RoLR timeline.

4. Summary of Proposals and Conclusion

A review of the current bilateral contract arrangement in this paper has shown that it is largely designed for a market structure of predominantly gentailers. As the market evolves with entry of new technologies and participants with new business ideas, the bilateral contract arrangement naturally should be enhanced to ensure that it remains a relevant and practical tool serving the needs of an increasingly diversified mix of MPs. Credit risks associated with bilateral contract settlement need to be assessed and monitored closely as well.

We have identified several issues with the current bilateral contract arrangement and analysed the following six potential enhancements in this paper:

1. for the buyer to be notified by the EMC of the seller-submitted bilateral contract data;
2. for the EMC to validate the seller’s actual generation or credit support level, or both, against the bilateral contract submission and settlement; specifically,
   a. for the seller’s bilateral contract submission to be validated and accepted only if its contract position can be sufficiently covered by its actual generation or credit support level, or both;
   and
   b. for the seller to be required to make prepayment of its negative PSS amount within 2 BDs if such exposure is not covered by its credit support held with the EMC.
3. to introduce WEP settlement and strike price settlement as new settlement mechanisms for bilateral contracts;
4. to allow bilateral contracts to be used for ex-post trade reallocation in the event of a buyer’s margin call;
5. to allow the expected bilateral settlement amount to be subtracted from the initial credit support requirement calculation for new MPs that have entered into bilateral contracts as buyers; and

\textsuperscript{10} RC 341: Review of Mechanisms to Mitigate Credit Default https://www.emcsg.com/f1615,122183/EMC341-EMA-LL.pdf
\textsuperscript{11} RC 359: Review of Credit Support Requirements in Alignment with the Lead Time for Transfers During a Retailer of Last Resort Event https://www.emcsg.com/f1841,139590/EMC359-EMA-WJ.pdf
(6) for the timeline for submission of bilateral contract data to be updated to T-15 calendar days to accommodate the RoLR timeline.

5. Consultation

The concept paper was published for consultation on 3 August 2020 and comments were received from 6 stakeholders.

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<tr>
<th>Comments from</th>
<th>Comments</th>
<th>EMC’s Response</th>
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<tbody>
<tr>
<td><strong>Proposal 1:</strong> for the seller-submitted bilateral contract data to be verified by the buyer before the EMC accepts the bilateral contract for net settlement</td>
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<tr>
<td>ExxonMobil</td>
<td><strong>We support</strong> Proposal 1 (bilateral contract data submission to be verified by the buyer before the EMC accepts the bilateral contract for net settlement).</td>
<td>We note ExxonMobil’s support.</td>
</tr>
<tr>
<td>YTL PowerSeraya</td>
<td>Bilateral arrangement between the buyer and seller is bound by a contractual relationship between the parties outside the wholesale market. <strong>We agree that the buyer shall be informed by the EMC once the seller submitted the bilateral contract data.</strong> Once buyer is informed of the submission, they can check and verify if it is in accordance with their agreed arrangement. If there is an erroneous submission, the buyer should contact the seller directly and request for a re-submission. <strong>There is no need for buyer to verify the submission in the system before it is accepted by EMC.</strong> The seller should be responsible to make sure that the submission is correct and in accordance with the agreement with buyer. The seller is likely to be the party whose money is at risk under a bilateral arrangement. The proposed step to have the buyer to verify before EMC accepts the bilateral contract for net settlement might result in situation whereby a correct submission is not being processed due to buyer slow in responding or intentionally “blocking” the change. For example, there is a standing bilateral arrangement of 100% WEQ, there is an agreement between the parties to reduce to 50% when the credit standing of the buyer deteriorates. When the seller wants to make the amendments, the buyer can intentionally block or delay the amendment and therefore increase the exposure of the seller.</td>
<td>We note YTL PowerSeraya’s comments and have modified Proposal 1 to allow the buyer to be informed of the bilateral contract data submission, but the buyer will not be required to verify such submission in the system.</td>
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<tr>
<td>Senoko</td>
<td>We agree that the current mechanisms in place create certain barriers to performing bilateral trades via EMC. However, the proposal of having the bilateral trade being verified by the buyer before it gets approved might lead to other issues. For instance, if the seller were to key in a higher bilateral volume than the contracted amount and the buyer accepts, rectifying this error could prove to be a</td>
<td>While having the EMC matching submissions of the buyer and the seller may effectively eliminate human error risks of both parties, it does not solve the issues described in the second example given by Senoko – the buyer could choose not</td>
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12 This is the original proposal published for industry consultation on 3 August 2020.
challenge as the buyer is put in an advantageous position with a higher contract coverage, lowering their NEMS credit exposure.

Another example would be when the buyer defaults on payments, and the seller is unable to revoke the bilateral arrangement as any change is contingent on the buyer accepting the bilateral trade volumes, this will create undue risks for sellers as a whole.

Hence, we are proposing for EMC to be the party verifying and accepting the bilateral trade. Once both the buyer and seller submit bilateral volumes & duration that concur, the trade gets accepted by EMC (could be automated with a standardised bilateral submission template). This eliminates the buyer side risk that we are currently facing, and potential seller side risk that Proposal 1 creates.

**Proposal 2:** for the EMC to validate the seller’s actual generation or credit support level, or both, against the bilateral contract submission and settlement.\(^{13}\)

| Senoko | We note that both GESC and BESC are both calculated using the 90-day rolling average exposure to the market. BESC amounts have been duly covered via bank guarantees / cash to mitigate against any potential defaults whilst generators have a net credit in the system. The proposal of 3.2.c whereby EMC performs a check before settling the bilateral arrangement could be over-compensating for the magnitude of the issue and is leaning towards over-mitigating the risks involved. Deeming a seller to have insufficient GESC on a daily basis due to a forced / unplanned outage would prove to be a deterrent and a barrier to bilateral trades, which contradicts one of the objectives of this consultation paper, whereby EMC is looking to minimize credit support requirements and as a result reduce circular cashflows. Gencos or sellers that have very high contract levels or fully hedged generation capacities could choose to generate below their contract levels due to favourable pool prices. By applying the layer of check as per proposal 2, this seller could then be deemed to have insufficient GESC to compensate for their bilateral coverage to other buyers. A daily GESC check against daily bilateral contracts would mean that buyers (retailers) dealing with sellers (especially ones with smaller portfolios) will need to have a bank guarantee on standby at all times as there could potentially be a trading day whereby their seller does not have sufficient GESC to cover their contract position. We encourage EMC to weigh the benefits of being overly conservative in their credit assessment approach as a trade-off with the potential to submit or submit a different set of contract data and render the seller’s submission ineffective. In view of the comments received from industry players, we have modified Proposal 1 to allow the buyer to be informed of the bilateral contract data submission, but the buyer will not be required to verify such submission in the system. We would like to clarify that the objective of Proposal 2 is to manage the potential credit risks associated with genco’s failure to deliver its contract position. We also note Senoko’s comments that the original proposal in Section 3.2.c (Option 1: Provision of credit support to cover the shortfall) might be a deterrent to bilateral trades and have thus proposed the alternative option (Option 2: Prepayment of uncovered debit position) where the EMC will continue to settle the bilateral contracts in full and the sellers are required to make prepayment for any uncovered negative PSS amounts within 2 BDs. |

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\(^{13}\) The original proposal published for industry consultation on 3 August 2020 was for settlement check (Proposal 2b) to follow Option 1 (Provision of credit support to cover the shortfall) of Section 3.2.1 of this paper.
<table>
<thead>
<tr>
<th>Comments from</th>
<th>Comments</th>
<th>EMC’s Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>slight change in daily GESC should not pose any significant risk to the system. As such, to encourage the uptake of bilateral contracts, we strongly disagree with proposal 2 and urge EMC to assess a seller’s credit requirements using the 90-day rolling average GESC instead of a daily GESC.</td>
<td>Settlement of futures positions could not be directly integrated into the NEMS settlement. However, with Proposal 2, it is possible to achieve the intended outcome via a financial trader using the bilateral contract arrangement in the NEMS.</td>
<td></td>
</tr>
</tbody>
</table>
| I Switch | Kindly request that Proposal 2 be expanded as follows:  
- Any Futures Position held by Market Participant to qualify as bilateral settlement to reduce the Credit Support to EMC for Spot purchase. Especially in the case of Independent Retailers who also have offsetting positions in the EFM. |  |
| YTL PowerSeraya | Issue 3.2.1: Failure-to-deliver by gencos  
Under EMC’s verification of submission and EMC’s settlement check, can we confirm that EMC will be notifying the buyer and seller in the event that the full amount submitted is not being cleared? | In Step 2 (EMC’s verification of submission) of Section 3.2 of this paper, the EMC shall either accept or reject the submission and notify both parties accordingly; in the original proposal in Step 3 (EMC’s settlement check) in Section 3.2.c of this paper (Option 1: Provision of credit support to cover the shortfall), the actual bilateral contract settlement amount will be reflected in the PSSs of the parties to the contract. |
| ExxonMobil | We would like EMC to clarify the verification process applied as part of Proposal 2 (EMC validates the seller’s actual generation or credit support level, or both, against the bilateral contract submission and settlement)  
a. The additional credit requirement for Sellers without generating assets may create an additional burden, which may not be reasonable considering the actual default risk, which may be low due to the good reliability of generation assets.  
b. As described in the consultation paper, Sellers without generating assets may be disadvantaged compared to integrated Gencos and we’re wondering if the proposed requirement could add to this inequality. | The additional credit support requirement for sellers is to mitigate uncovered risk exposure and will be in proportion to their risk of non-delivery.  
To safeguard the financial integrity of the NEMS, a seller’s short position in a bilateral contract should either be backed by its physical generation capabilities or its credit support. Proposal 2 does not disadvantage sellers without generating assets in this aspect. |
| PacificLight Power (PLP) | We understand that the objective of the review is to ensure that the bilateral credit arrangements are relevant and practical. We do not believe that the suggested modification under proposal 2 meets this objective. | We note PLP’s comments and would like to clarify that the objective of Proposal 2 is to manage the potential credit risks associated with |
When a Genco has a unit down for maintenance the reduced generation level during the maintenance period might not be adequate to offset exposure from the retail side. However, since maintenance activities are pre-planned, short term and infrequent it is unlikely to cause any additional risk of default by the gentailer. We therefore **do not consider it is necessary to impose the additional administrative burden and costs on a Genco for such a remote risk.**

Prior to a pre-planned maintenance where a reduction in generation level is expected, the genco should either reduce its contract level or provide credit support to cover the potential short position such that there is no uncovered credit risk left to the market.

We also note PLP’s comments that the original proposal imposes additional administrative burden and costs, and have thus proposed the alternative option (Option 2: Prepayment of uncovered debit position) where the EMC will continue to settle the bilateral contracts in full and the sellers are required to make prepayment for any uncovered negative PSS amounts within 2 BDs.

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**Proposal 3: to introduce options of different bilateral contract settlement mechanisms**

<table>
<thead>
<tr>
<th>Company</th>
<th>Comments</th>
<th>EMC’s Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>ExxonMobil</td>
<td>We would welcome additional settlement options mentioned in Proposal 3.</td>
<td>We note ExxonMobil’s preference of introducing strike price settlement option and would like to assure MPs that the bilateral contract data submitted to the EMC will be kept confidential as required by the market rules.</td>
</tr>
<tr>
<td></td>
<td>a. We think that offering the “complete” settlement as agreed between the parties of a Bilateral Contract could – if conducted appropriately - remove the additional administration efforts for buyer/seller and be more efficient overall if done by EMC for many MPs.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. We would welcome a strike price settlement option and would like to better understand how EMC could ensure the confidentiality of this information.</td>
<td></td>
</tr>
<tr>
<td>YTL PowerSeraya</td>
<td>For market price settlement, we would like to have WEP in addition to USEP.</td>
<td>We note YTL PowerSeraya’s preference of introducing WEP settlement option.</td>
</tr>
<tr>
<td>Keppel</td>
<td>Keppel does not see substantial benefit in providing an alternative settlement mechanism. Can EMC share what the indicative cost to implement an alternative settlement mechanism will be like?</td>
<td>We note Keppel’s comments and have included an indicative cost estimation in Section 6 of the paper.</td>
</tr>
<tr>
<td>Comments from</td>
<td>Comments</td>
<td>EMC's Response</td>
</tr>
<tr>
<td>--------------</td>
<td>----------</td>
<td>----------------</td>
</tr>
<tr>
<td>PacificLight Power</td>
<td>To reduce administrative and IT development costs we do not believe that any new bilateral settlement mechanism should be implemented until there is sufficient demand.</td>
<td>We note PLP’s comment.</td>
</tr>
</tbody>
</table>

**Proposal 4: to allow the bilateral contract arrangement to be used for ex-post trade reallocation in the event of a buyer's margin call**

| Keppel | Keppel does not recommend allowing the use of bilateral contract arrangements to be used for ex-post trade reallocation to satisfy a buyer’s margin call. Market Participants should practice sufficient self-prudence to meet their own margin call. Furthermore, it is not practical to use bilateral contract arrangements to satisfy a buyer’s margin call within the short lead time of 2 BDs. | We note Keppel’s comment and would like to clarify that Proposal 4 is to provide an additional means for MPs to meet their margin calls. It could be more practical compared to the existing means if the MP already has established relationship with some selling MPs. |

**Proposal 5: to allow the expected bilateral settlement amount based on the seller's submission to be subtracted from the initial credit support requirement calculation for new MPs that have entered into bilateral contracts as buyers**

| ExxonMobil | We support Proposal 5 (the expected bilateral settlement amount based on the seller’s submission to be subtracted from the initial credit support requirement calculation) but would like it to be applied for all (and not only new) MPs that have entered into bilateral contracts as buyer. Maybe you can clarify what is meant with “new MP” but assuming bilateral contracts are used by parties from time to time (and not continuously), the rolling 90-day average may not consider the effect of a recently concluded bilateral contract if it wasn’t used in the last 90-day period. | We note ExxonMobil’s support of Proposal 5 and additional proposal to review the credit support requirement of existing MPs when they enter into new bilateral contracts. We would endeavour to assess the proposal as part of the review of the credit support requirement. |

**Proposal 6: for the timeline for submission of bilateral contract data to be updated to T-15 calendar days to take the additional RoLR timeline into consideration**

| Senoko | We agree with the proposal 6, however also suggest that EMC includes a clause whereby bilateral contract volumes for buyers in default are to be automatically set to 0 to mitigate against any seller side risks. | We note Senoko’s support of Proposal 6 and request to allow bilateral contracts to be zeroised when the buyer is in default. However, such request would contravene the intention of the requirement for ex-ante submission of bilateral contract data. We will separately study the issue of zeroising bilateral contracts of a buying MP. |

**General Comments**

| Keppel | In view of several potential defaults by newer market participants and their subsequent withdrawal from the | We note Keppel’s comment and will review entry |
market, Keppel recommends that EMC takes a more prudent view on the credit support of new market entrants. New market entrants with no generation assets and low capital should be required to maintain a higher credit support level.

6. Implementation Time and Cost

The projected implementation time and cost of the six proposals combined, including Option 2 for Proposal 2b, is presented in Table 2 below.

**Table 2: Implementation Time and Cost**

<table>
<thead>
<tr>
<th>Time Estimates</th>
<th>Man week(s)</th>
<th>Elapse Time Calendar week(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0. Vendor Selection/Preparation</td>
<td>N.A.</td>
<td>11</td>
</tr>
<tr>
<td>1. Change Requirement Scoping and Analysis</td>
<td>17.4</td>
<td>9</td>
</tr>
<tr>
<td>2. System Development/Testing/Project Management</td>
<td>82.3</td>
<td>29</td>
</tr>
<tr>
<td>3. User Acceptance Testing (UAT)</td>
<td>14.0</td>
<td>14</td>
</tr>
<tr>
<td>4. Audit</td>
<td>5.0</td>
<td>5</td>
</tr>
<tr>
<td>Total Effort Required</td>
<td>118.7</td>
<td>68</td>
</tr>
</tbody>
</table>

**Cost**

1. Internal EMC Manpower                $197,096.00
2. External resource to support (Vendor excluding Audit) $321,556.16
3. Audit                                $40,000.00

7. RCP’s Decision at the 119th RCP Meeting

The EMC recommended, at the 119th RCP meeting, that the RCP support the six proposals as described in Section 4 of this paper and task the EMC to draft the relevant rule modifications.

The Panel **unanimously supported** the following proposals:

- **Proposal 1**: for the buyer to be notified by the EMC of the seller-submitted bilateral contract data; and
- **Proposal 6**: for the timeline for submission of bilateral contract data to be updated to T-15 calendar days to accommodate the RoLR timeline.

The Panel, by majority vote, **supported** the following proposals:

- **Proposal 2**: for the EMC to validate the seller’s actual generation or credit support level, or both, against the bilateral contract submission and settlement; specifically,
  - for the seller’s bilateral contract submission to be validated and accepted only if its contract position can be sufficiently covered by its actual generation or credit support level, or both; and
  - for the seller to be required to make prepayment of its negative PSS amount within 2 BDs if such exposure is not covered by its credit support held with the EMC.
- **Proposal 3**: to introduce WEP settlement and strike price settlement as new settlement mechanisms for bilateral contracts;
- **Proposal 4**: to allow bilateral contracts to be used for ex-post trade reallocation in the event of a buyer’s margin call; and
- **Proposal 5**: to allow the expected bilateral settlement amount to be subtracted from the initial credit support requirement calculation for new MPs that have entered into bilateral contracts as buyers.

Details of voting outcomes are set out in Table 3 below.

**Table 3: Summary of Voting Outcomes**

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Representative of EMC</td>
<td>Mr. Henry Gan</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
<td>Abstain</td>
<td>Abstain</td>
</tr>
<tr>
<td>Representative of PSO</td>
<td>Mr. Soh Yap Choon</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
</tr>
<tr>
<td>Mr. Tony Tan</td>
<td>Support</td>
<td>Do not Support</td>
<td>Do not Support</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
</tr>
<tr>
<td>Mr. Teo Chin Hau</td>
<td>Support</td>
<td>Do not Support</td>
<td>Do not Support</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
</tr>
<tr>
<td>Mr. Marcus Tan</td>
<td>Support</td>
<td>Do not Support</td>
<td>Abstain</td>
<td>Support</td>
<td>Abstain</td>
<td>Support</td>
</tr>
<tr>
<td>Representative of Transmission Licensee</td>
<td>Ms. Carol Tan</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
</tr>
<tr>
<td>Representative of Retail Electricity Licensee</td>
<td>Mr. Sean Chan</td>
<td>Support</td>
<td>Support</td>
<td>Do not Support</td>
<td>Do not Support</td>
<td>Support</td>
</tr>
<tr>
<td>Representative of the market support services licensee</td>
<td>Ms. Ho Yin Shan</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
</tr>
<tr>
<td>Person experienced in financial matters in Singapore</td>
<td>Mr. Tan Chian Khong</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
</tr>
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