

RCP PAPER NO. : **EMC/RCP/46/2009/CP20**

SUBJECT : **REVIEW OF EMC FEES ON INTERRUPTIBLE LOAD PROVIDERS**

FOR : **COMMENTS**

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Executive Summary

The paper analyses the rule change proposal to charge Interruptible Load providers of Reserve (ILs) EMC fees, since they utilize services from EMC. For consistency, if such fees were to be recovered from ILs, then they would have to be similarly applied to other buyers and sellers of Reserve and Regulation.

The study found that there is a reasonable basis to charge EMC fees to Reserve and Regulation from the perspectives of fairness (ILs utilize more services than other loads without IL function) and to accurately reflect the prices of reserve.

However, extending EMC fees to Reserve and Regulation providers will have no material improvement to economic efficiency; given the price inelasticity of Reserve and Regulation, EMC fees will be directly passed on to Load/Consumers eventually in any case.

On balance, weighing the minimal benefits with the likely system costs and resources required to implement the rule change, EMC proposes not to change the current method of charging EMC fees.

At the 45th RCP meeting, the RCP requested EMC to provide the start-up costs incurred by EMC to implement interruptible loads.

At the 46th RCP meeting, EMC provided the panel with the cost information. By majority, the RCP voted 8 against 2 to maintain the current method of charging EMC fees. One panel member abstained from voting.

1. Introduction

Currently the majority of EMC's administration fees are recovered by apportioning them over the energy injection and withdrawal quantities (IEQ and WEQ) in the wholesale market. The other remaining fees are recovered through direct charging to the specific parties, including derogation fees on derogation applicants, and cost/financial penalties on parties found by the Market Surveillance and Compliance Panel to be guilty of rule breaches or violations.

During the 2009 RCP Work Plan Prioritization exercise, a proposal was received suggesting that Interruptible Load (ILs) providers of Reserve should be subjected to EMC/PSO fees, since they receive services from these two organizations. This study reviews the original principles behind the current EMC fee recovery mechanism, and analyses the merit of recovering EMC fees from ILs based on the nature of services that EMC provides to them. As the current EMC fee recovery mechanism was approved by the EMA, any proposed changes will have to be approved by the EMA. Further, the analysis will focus on EMC fees, although EMA can decide whether to extend the findings to similarly apply to PSO fees.

2. Principles behind EMC Fee Recovery Mechanism

2.1 Original Recommendations from Consultants

The current EMC fee recovery mechanism was based on a report by the LECG¹ consultants, who proposed the following key principles in the recovery of fees and charges in the Singapore Wholesale Electricity Market (SWEM):

- **Compliance with Market Rules and Market License** – Condition 18 in EMC's Market License states that it should:
 - Establish prices that reflect the underlying cost structure of the services provided (e.g. fixed prices to recover fixed costs, and usage-based prices to recover variable costs)
 - Ensure that the fees and charges do not discriminate between any persons or class or classes of persons similarly situations
- **Economic Efficiency (Cost Recovery)** – For user services (services that can be commercially and technically isolated to particular users), the costs of a service should be allocated to users of that service. Where it cannot be meaningfully allocated to users, these common services costs should be allocated as near to end users (electricity consumers or retailers) as possible, so as to minimize distortions.
- **Economic Efficiency (Price Setting)** - Usage-based prices should be used to recover variable costs, based on the user-pay principle. Conversely, fixed costs should be recovered using a fixed charge; however, if the fixed charge is so high as to pose a significant barrier to new entrants, then it needs to be weighed up against applying variable charges (e.g. based on energy quantities).
- **Fairness** – There are two dimensions in analyzing fairness, namely vertical (those who have different levels of use of a service should pay different amounts) and horizontal (those who receive the same level of service should pay the same amount).

¹ EMC Fee Methodology, September 2002, LECG

- **Simplicity** – The fee structure should be simple in design and allow Market Participants to easily understand what services they are paying for, the basis for calculating those fees, and who is liable to pay each fee.

As about 90% of EMC’s cost were considered fixed, the principle of “Economic Efficiency (Price Setting)” above suggests that setting fixed fees to recover fixed non-attributable costs for EMC common services creates the least distortions to economic efficiency. However, this leads to large fixed fees for market participation, which could deter new entrants. As such, the consultants proposed to charge fees on a per-unit basis rather than a fixed fee, which is consistent with practice in other competitive electricity markets.

They proposed to use the volume of energy traded to proxy the varying levels of use that Market Participants require of EMC’s services. As a result, it was determined that most of EMC’s costs would be recovered by means of a fee per unit of energy traded on both IEQ and WEQ. In addition, a numbers of services were identified as user services, whereby the costs involved in providing the service should be charged to the specific users.

Table 1: Services Identified by LECG Consultants as User Services

| S/N | Service | Comments |
|-----|---|---|
| 1 | Managing registration of Market Participants, their facilities and their agents | The fee of S\$5,000 is charged on the registration applicant. |
| 2 | Derogation from the Market Rules | The fee of S\$5,500 is charged on the derogation applicant. |
| 3 | Investigation on parties that breach rules | Costs/Financial penalties (if any) applied onto parties found to be guilty of rule breaches are used to offset EMC’s exogenous budget for market assessment. The financial penalties could be either at or above the cost of resources incurred in the investigation. |

The above principles were used to set the basis of recovering EMC fees when the wholesale electricity market was first started, and these principles should be applied consistently to all services over time as the market evolves.

2.2 Subsequent Removal of Registration Fees

In 2007, there was a change to the original fee mechanism in Table 1, arising from a rule change to remove the registration fee (s/n 1). The rule change was approved on the basis that the registration fee:

- i) is seen by some small producers as a high cost to participate in SWEM;
- ii) has negligible impact on portion of EMC fees collected on a per MWh basis; and
- iii) if removed, is unlikely to result in undesirable behavior such as frivolous applications

3. Analysis

3.1 EMC Services Utilized by ILs

An IL provider is a registered market participant who offers reserve analogous to that from gencos, by letting either its own load or its customer's load be interrupted for a limited duration. The IL makes reserve offers, and receives payments for scheduled reserve, similar to gencos. To analyze if ILs should be charged EMC fees, we first assess the type of EMC services that they utilize, vis-à-vis the whole set of services provided by EMC. This is shown in the table below:

Table 2: Key Services Provided by EMC

| S/N | Service | Covers | Common or User Service? | Used by ILs? | Are ILs Charged Directly? |
|---------------------------------|------------------------------|--|-------------------------|--------------|---------------------------|
| Market Operations and IT | | | | | |
| 1 | Pricing and Information | Receiving and validating offers from generators, generation and publication of clearing and final prices, and outlook scenarios, management of queries about prices and scenarios, calculation of final settlement prices | Common | Yes | No |
| 2 | Settlement | Receiving bilateral trade data, and producing settlement statements, producing invoices and reconciling settlement accounts, management of prudential requirements, collection of fees (for EMC and PSO) and MEUC | Common | Yes | No |
| 3 | Systems | Provision of market applications (e.g. MCE, PowerBid, the settlements system and the website), help desk services to enable resolution of any customer problems, and enhancements to services over time as agreed with customers | Common | Yes | No |
| 4 | Ancillary Service Management | Assessing ancillary service contracts and checking test results for report to EMA and PSO. | Common | No | No |

| S/N | Service | Covers | Common or User Service? | Used by ILs? | Are ILs Charged Directly? |
|------------------------------|---------------------------------|--|-------------------------|--------------|----------------------------|
| Market Administration | | | | | |
| 5 | Market Participation | A) Managing registration of Market Participants, their facilities and their agents | User | Yes | No (neither are other MPs) |
| | | B) Derogation from the Market Rules | User | Yes | Yes |
| 6 | Market Assessment | A) General monitoring, investigation, enforcement and reporting to MSCP, as well as management of inquiries and complaints from Market Participants, liaison between MSCP and the market, and education about the rules. | Common | Yes | No |
| | | B) Costs for investigation efforts and/or financial penalty impose by on party found guilty by the MSCP of rule breaches. | User | Yes | Yes |
| 7 | Rule Changes | Receipt, analysis, reporting, publication and process management of Rule changes | Common | Yes | No |
| 8 | Panel Administrative support | Secretarial and administrative support to the MSCP, DRCP as required. | Common | Yes | No |
| 9 | Dispute Resolution ² | Administrative fees involved with maintaining the Dispute Resolution Counselor and the Dispute Resolution and Compensation Panel (DRCP) | Common | Yes | No |

Of the 9 key EMC services identified by the LECG consultants above, ILs are liable for payment of direct charges for all User services (s/n 5B and 6B), except for registration (s/n 5A) from which the whole market is exempted. At the same time, ILs pay for common services indirectly based on energy consumed; it can only provide IL service when it is consuming energy, just like how most GRFs (except OCGT) can provide reserve only when they are generating energy.

² Fees charged by arbitrators/mediators on the DRCP for services rendered in arbitrating/mediating on a specific case are agreed upon and paid by the disputing parties. However, these fees are not included in the EMC budget/fee and are effectively outside of the SWEM.

In conclusion, other than the registration fee which was removed for all Market Participants, ILs have to pay for the other user services that they consume, namely for Derogation and components of Market Assessment and Dispute Resolution. The subsequent section analyzes if ILs should be charged for the common, non-attributable services that they utilize for reserve provision.

3.2 Basis to Charge ILs for Common Services

Based on the assessment above, charging ILs for the common services that they consume for reserve provision is consistent with the principles behind the EMC fee recovery mechanism analyzed earlier, for the following reasons:

- **Economic Efficiency** - From an economic perspective, charging ILs for the EMC services that they utilize will likely result in higher IL reserve offers, which in turn leads to more accurate price signals on the true cost of reserve provision in the wholesale market.
- **Fairness** – The principle of vertical fairness states that those who have different levels of use of a service should pay different amounts. In this case, since ILs utilize more services compared to other loads without Reserve capability, it stands to reason that they should pay higher fees beyond what is currently applied to the latter group (e.g. EMC fees levied on WEQ).

However, extrapolating on the concept of horizontal fairness (those who receive the same level of service should pay the same amount), gencos providing reserve/regulation and paying for reserve/regulation, and load paying for regulation should be charged on the same basis as ILs, since they utilize comparable services. Essentially, in the alternative arrangement, both buyer and seller of all three products traded in SWEM will be apportioned the EMC fee, as summarized in Table 3 below:

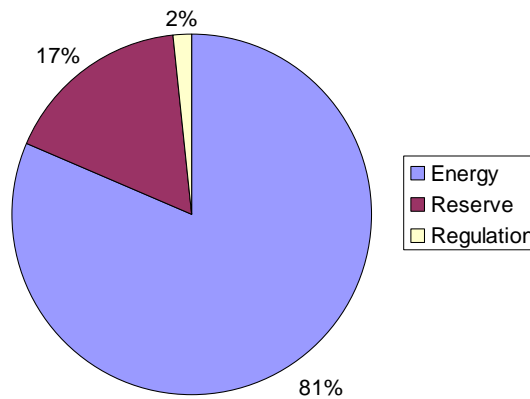
Table 3: Current and Alternative EMC Common Fee Recovery Mechanism, by Products Traded in SWEM

| Products | Current | | Alternative | |
|------------|-------------------------|--------------------------------------|---|---|
| | Seller | Buyer | Seller | Buyer |
| Energy | Gencos pay based on IEQ | Load (including IL) pay based on WEQ | Gencos pay based on IEQ | Load (including IL) pay based on WEQ |
| Reserve | Nil | Nil | Gencos and ILs pay based on scheduled reserve | Gencos pay based on reserve proportion share of total scheduled reserve |
| Regulation | Nil | Nil | Gencos pay based on scheduled regulation | Gencos and Load pay based on share of IEQ ³ /WEQ of scheduled regulation |

³ Generators are charged up to the first 5 MWh of the IEQ

The above reasons support the charging of EMC fees to both the reserve market (both genco and ILs) and regulation market (both genco and load). Assuming that EMC fees were recovered from all the 3 markets of energy, reserve and regulation based on their respective MW quantities, the EMC fees to be borne by the 3 markets is shown in the figure below:

Figure 1: Split in EMC Fees by Respective Markets based on 2008 Average Quantities



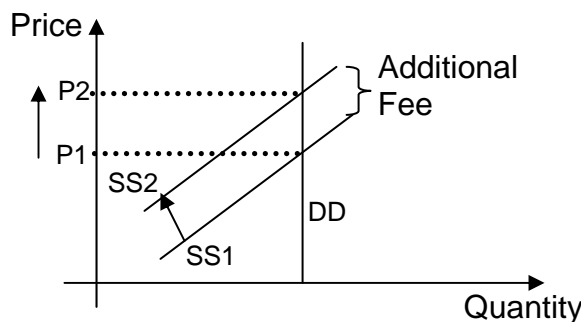
If the EMC fees were charged based on the average quantities in the energy (IEQ, WEQ), reserve (schedule) and regulation (schedule) markets, then based on the 2008 figures, the EMC fees would be apportioned in a 81:17:2 ratio for the Energy:Reserve:Regulation markets.

3.3 Implications of Charging EMC Fees on Reserve and Regulation Markets

The earlier section concludes that it makes sense from a theoretical perspective to charge EMC fees to the Reserve and Regulation markets. This section analyses the practical implications if the proposal were carried out.

The demand for all three classes of Energy, Reserve and Regulation are all price-inelastic in the short-run, and are determined based on either the load forecast or system security parameters. Correspondingly, the demand/supply analysis on the three classes of products is shown in the figure below:

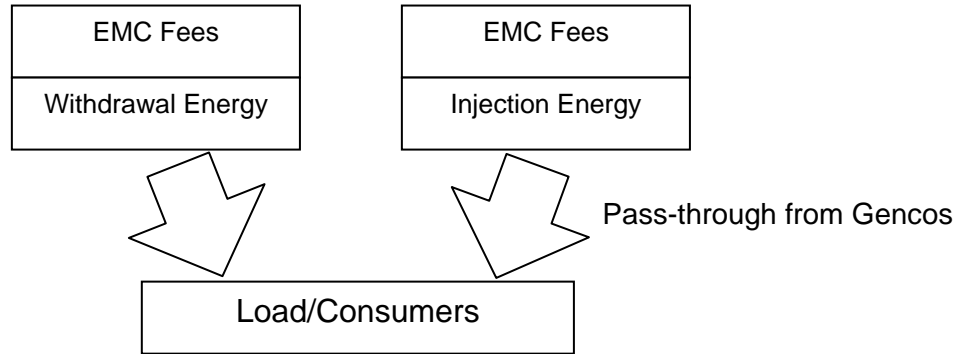
Figure 2: Demand/Supply Analysis of Applying Fixed Uniform Fee



The demand curve (DD) is shown above as a vertical line at the load forecast/system security requirement level. Arising from the charging of a fixed uniform fee (e.g. EMC/PSO fees), the supply curve shifts up from SS1 to SS2, by the amount of the additional fee.

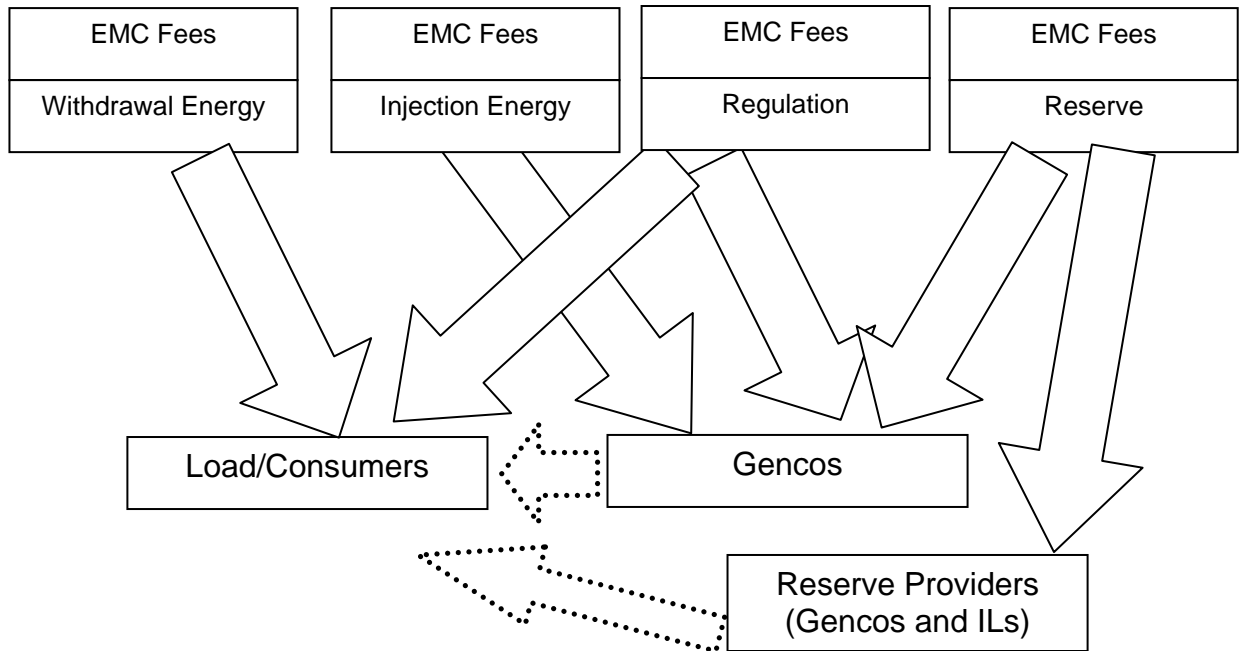
Arising from the inelastic demand curve, the price will shift up from P1 to P2 by the amount of the additional fee. This implies that when faced with an inelastic demand, the suppliers will simply pass on any additional fees onto the consumer. There will be no changes to the quantity demand or the merit order of genco schedules and thus, there will be negligible impact on economic efficiency.



Figure 3: Current Method of Charging EMC Fees



The figure above shows the impact when EMC fees are charged to both IEQ and WEQ. EMC fees levied on WEQ are directly translated to Load/Consumers. At the same time, since Gencos are facing an inelastic demand, they will pass through the EMC fees levied on their IEQ onto Load/Consumers. So in effect, all of the EMC fees will be eventually borne by Load/Consumers.

Figure 4: Alternative Method of Charging EMC Fees



Legend:  Direct Cost Recovery
 Cost Pass-Through due to Inelastic Demand

The figure above shows the impact in an alternative arrangement, whereby EMC fees are apportioned to IEQ, WEQ, Reserve and Regulation. As shown, EMC fees will be charged directly to loads/consumers (through WEQ and Regulation), Gencos (IEQ, Reserve and Regulation) and Reserve Providers (could be either a Genco or IL, through Reserve). However, given that Gencos and Reserve Providers face inelastic demand for Energy, Reserve and Regulation, this provides the channel through which they will pass through these EMC fee components to Load/Consumers, who are the end-users.

From the above 2 scenarios, we note that in either case, the EMC fees will pass on to the end-user (Load/Consumers), regardless of how the EMC fees are apportioned between IEQ, WEQ, Reserve and Regulation. There will be negligible effects on the economic efficiency on the market as a whole, as the gencos' schedule will not be affected.

4. CONSULTATION

EMC published the concept paper for this proposal on the 24 July 2009 to seek the industry's feedback. The comments received from the industry together with EMC comments are reproduced below.

| From | Comments | EMC's Response |
|--------------|---|---|
| Senoko Power | <p>We note that the EMC proposed maintaining status quo - i.e. IL providers will not be charged EMC fees for consuming services from the EMC. The justification for this recommendation was that it had minimal benefits with potential system costs and resources.</p> <p>We find this reasoning unacceptable, especially since the paper went through great lengths to explain why charging IL providers EMC fees would in fact be equitable; because of this, we find the conclusion reached very surprising. Also, the paper did not explain what the "system costs and resources" that would be incurred would be.</p> <p>That IL providers consume EMC services has been established. The question now is how these providers should be charged.</p> <p>There is already a basis for charging gencos for reserve and we do not imagine it to be too difficult to establish a basis for charging IL providers.</p> <p>That the cost of EMC fees borne by gencos and IL providers (if imposed) will be eventually borne by the customers is beside the point. As a market participant, we wish to be assured that we are paying only for services that we consume and that our fees are fairly established.</p> | <p>We do not recommend charging IL providers fees specifically to provide reserve. ILs do pay for common services indirectly based on energy consumed. Moreover, ILs can only provide IL service when it is consuming energy. Similarly we do not GRFs fees directly for providing reserve but for their energy production.</p> <p>If IL reserve providers were to be charged EMC fees, then these fees would have to be similarly extended to genco providers (sellers) of Reserve and Regulation and buyers of reserve and regulation. The gist of this paper's argument is that while equitable, these fees will eventually be incident onto the end users of electricity, albeit through different channels. Since there is no material improvement in economic efficiency, while incurring additional costs for system changes, the paper proposes to stick to the current fee recovery methodology.</p> <p>As for the charge applied to gencos, it is reserve charge for the cost of purchasing reserve to guard against generators tripping.</p> |

| From | Comments | EMC's Response |
|----------------|--|---|
| Diamond Energy | <p>It is important to recognize that the interruptible load provider is the load facility itself or a service provider acting on behalf of the load facility. Load facilities are also contestable consumers and, in accordance with current regulations, have entered into an electricity supply arrangement with a) a Retail Licensee, b) SP Services or c) the wholesale market. Under said arrangement EMC fees and PSO fees are already being levied on every MWh consumed.</p> <p>Reserve energy traded corresponds to a subset of the same energy consumed under the electricity supply arrangement of which both EMC fees and PSO fees are already being levied on the load facility. Any proposal to apply EMC fees and/or PSO fees on the subset of reserve energy after said fees have already been levied under the electricity supply arrangement would be duplicative.</p> <p>We therefore support the EMC's proposal not to change the current method of charging EMC fees, however, for the reason stated above (i.e. EMC fees are currently already being levied on the load facility).</p> | <p>We recognize that IL providers are also load facilities and that they have to pay for EMC fees on the energy (WEQ) that they consume. This is already mentioned in the paper (section 3.1 after Table 2). However, we do not agree that it is duplicative to charge fees to ILs for providing reserve since they utilize relatively more EMC resources than load facilities that do not provide reserve. However if ILs are charge fees separately for providing reserve, GRFs should also be similarly charged for providing reserve.</p> |

5. CONCLUSION

The paper analyses the rule change proposal to charge Interruptible Load providers of Reserve (ILs) EMC fees, since they receive services from EMC. For consistency, if such fees were to be recovered from ILs, then they would have to be similarly applied to other buyers and sellers of Reserve and Regulation.

The study found that there is a reasonable basis to charge EMC fees to Reserve and Regulation, from the perspectives of fairness (ILs utilize more services than other loads without IL function) and economic efficiency (to reflect the accurate prices of reserve). However, from a practical approach, it found that there is no material difference whether EMC fees are charged to Reserve and Regulation. This is because given the price inelasticity of Reserve and Regulation, the EMC fees will be passed on to Load/Consumers eventually in any case. More importantly, there is no material improvement in economic efficiency to the industry even if the changes are made.

On balance, weighing the minimal benefits with the likely system costs and resources required to implement the rule change, EMC proposes not to change the current method of charging EMC fees.

6. DECISION BY RCP

At the 45th RCP meeting, the panel discussed the points raised in this paper and considered the comments from two market participants. The panel deferred its decision and requested EMC to provide the startup cost incurred by EMC to implement interruptible load.

At the 46th RCP meeting, EMC informed that start-up cost was estimated at \$100,000. The panel noted that this constitutes about 1% of the initial total market implementation costs of EMC. The panel members voted 8 against 2 in favour of EMC's recommendation, which is to maintain the current method of charging EMC fees. One panel member abstained from voting.

Those who voted in favour of maintaining the current method:

- | | |
|-----------------------|--|
| 1. Mr Brendan Wauters | Representative of Generation Licencee |
| 2. Mr Chan Hung Kwan | Representative of Transmission Licencee |
| 3. Mr Dallon Kay | Representative of Generation (Wholesaler) Licencee |
| 4. Dr Goh Bee Hua | Consumer Representative |
| 5. Mr Kenneth Lim | Representative of EMC |
| 6. Mr Ng Meng Poh | Representative of Retail Electricity Licencee |
| 7. Mr Robin Langdale | Representative of financial subject matter expert |
| 8. Mr Sim Meng Khuan | Representative of Generation Licencee |

Those who voted against it:

- | | |
|-------------------|---------------------------------------|
| 1. Mr Philip Tan | Representative of Generation Licencee |
| 2. Mr Yeo Lai Hin | Representative of PSO |

Those who abstained:

- | | |
|-----------------|---|
| 1. Ms Annie Tan | Representative of Retail Electricity Licencee |
|-----------------|---|