Singapore Electricity Market Rules

Chapter 7
Settlement

Energy Market Authority

1 April 2022
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1 INTRODUCTORY RULES

1.1 PURPOSE

Explanatory Note: For generality, these rules allow for more than one MSSL – although some MSSL functions, most notably the reconciliation of metering data, the allocation of losses, etc., are natural monopoly functions that cannot realistically be decentralised among multiple MSSLs.

1.1.1 This chapter sets out the respective rights and obligations of the EMC, the PSO, market participants and market support services licensees in determining, billing for and paying financial obligations arising from transactions in the wholesale electricity markets and under other provisions of the market rules and applicable law, including financial obligations arising from or relating to the following:

1.1.1.1 the markets for energy, regulation and reserve of each reserve class;

1.1.1.2 financial transmission rights;

1.1.1.3 bilateral financial contracts settled through the EMC;

1.1.1.4 contracted ancillary services; and

1.1.1.5 vesting contracts.

1.1.2 Any reference in this Chapter to a market support services licensee shall be deemed to be a reference only to a market support services licensee that has been authorised to participate by the EMC pursuant to section 3 of Chapter 2.

1.1.3 The provisions in respect of load registered facilities in this Chapter shall not be construed and applied to any load registered facility except that, if the EMC has published a notice referred to in section 5.1.2.2 of Chapter 2, the provisions in respect of load registered facilities in this Chapter shall, to the extent applicable and from the effective date specified in that notice, then be construed and applied to the type of load registered facilities referred to in that notice.
1.2 **TAXES**

1.2.1 Notwithstanding any other provision of this Chapter, all taxes and government fees, levies or charges applicable to the financial obligations referred to in section 1.1.1 shall be applied by the EMC where and in the manner required by *applicable law*. The methodology for the application of any such taxes and government fees, levies or charges shall be *published* by the EMC and updated as required.

1.3 **TRANSITORY PROVISIONS**

1.3.1 In relation to dispatch periods commencing before 28 June 2011 (and their corresponding settlement intervals), the following sections in force immediately before 28 June 2011 shall continue to apply, notwithstanding the modifications relating to the following sections taking effect on or from 28 June 2011:

- 1.3.1.1 section 2.1.2;
- 1.3.1.2 section 2.2.3;
- 1.3.1.3 section 3.5.3;
- 1.3.1.4 section 3.7;
- 1.3.1.5 section 4.1.7;
- 1.3.1.6 section 4.1.8;
- 1.3.1.7 section 4.1.9; and
- 1.3.1.8 section 4.4.
2 SETTLEMENT DATA

2.1 RESPONSIBILITIES

2.1.1 It shall be the responsibility of a market support services licensee to:

2.1.1.1 undertake, to the extent required by and in accordance with the metering code and any other applicable code of practice, all activities necessary to determine the energy quantities specified in section 2.2.3;

2.1.1.2 provide to the EMC, to the extent required by and in accordance with the metering code and any other applicable code of practice, the designation and identity of the RQMs and the loss factors and other adjustments that will be used to determine IEQs at associated MNNs or WEQs at the SHUB;

2.1.1.3 provide to the EMC such other metering-related information to the extent required by and in accordance with this Chapter and Appendix 7B, the metering code and any other applicable code of practice;

2.1.1.4 provide such information to the EMC as may be required for the EMC to establish and maintain such settlement accounts in accordance with section 2.1.2 as may be required to enable the market support services licensee to perform its obligations under these market rules, any applicable market manual, its electricity licence, any applicable code of practice and any contract that it may have with a person on whose behalf it provides market support services pertaining to the wholesale electricity markets;

2.1.1.5 establish and maintain such bank accounts as may be required to enable it to perform its obligations under these market rules, any applicable market manual, its electricity licence, any applicable code of practice and any contract that it may have with a person on whose behalf it provides market support services pertaining to the wholesale electricity markets;

2.1.1.6 provide such assistance and information as may be requested by the EMC for the purposes of assisting the EMC to resolve settlement disputes where the subject-matter of the settlement dispute relates to or involves the accuracy of information provided to the EMC by the market support services licensee; and

2.1.1.7 perform the activities referred to in sections 2.1.1.1 to 2.1.1.6 in accordance with these market rules, any applicable market
manual, its electricity licence and any applicable code of practice.

2.1.2 The EMC shall establish procedures whereby each market participant and market support services licensee shall provide to the EMC such information as may be required by the EMC to establish and maintain a settlement account for it, such that:

2.1.2.1 each settlement account is associated with a single market participant or market support services licensee, in the sense that that market participant or market support services licensee is financially responsible for the settlement payments made into or from that settlement account; and

2.1.2.2 each market participant and each market support services licensee is associated with a single settlement account, in the sense that the settlement payments made with respect to that market participant or market support services licensee are accounted for, invoiced and made through that settlement account, except that,

2.1.2.3 where a market participant or market support services licensee has embedded generation facilities, the market participant or market support services licensee will be associated with a separate settlement account for each of its EGF groups, provided always that, where the market participant or market support services licensee only has one EGF group, and has no other generation facility that has not been assigned to such EGF group and no other load facility which load has not been assigned as the associated load of such EGF group, then such market participant or market support services licensee shall be associated only with a single settlement account; and

2.1.2.4 where a market participant is registered as a market participant for the sole purpose of registering one or more generation facilities as one or more non-exporting embedded intermittent generation facilities, the EMC is not required to establish and maintain a settlement account for such market participant.

2.1.3 The EMC shall be entitled to and shall rely on any metering data or corrected metering data provided to it by a market support services licensee in accordance with this Chapter and Appendix 7B for determining settlement amounts in accordance with this Chapter and, notwithstanding section 13 of Chapter 1:
2.1.3.1 the EMC shall not be required to inform any person of the receipt or use of such metering data or corrected metering data other than in the ordinary course of determining and reporting settlement amounts;

2.1.3.2 the EMC shall not be liable to any person in respect of the use of such metering data or corrected metering data where effected in accordance with this Chapter; and

2.1.3.3 the market support services licensee submitting such metering data or corrected metering data shall indemnify and hold harmless the EMC in respect of any and all claims, losses, costs, liabilities, obligations, actions, judgements, suits, expenses, disbursements and damages incurred, suffered, sustained or required to be paid, directly or indirectly, by, or sought to be imposed upon, the EMC arising from the use of such metering data or corrected metering data where effected in accordance with this Chapter.

2.2 ENERGY, REGULATION AND RESERVE MARKET DATA

2.2.1 For the purposes of this Chapter, a reference to “GRF m” shall mean a reference to the GRF located at “MNN m”, a reference to “IRF m” shall mean a reference to the IRF located at “MNN m”, a reference to “GSF m” shall mean a reference to the GSF located at “MNN m”, and a reference to “LRF p” shall mean a reference to a given load registered facility associated with restricted energy bid p.

2.2.2 The EMC shall, for each dispatch period and in accordance with section 10 of Chapter 6, determine the following energy, regulation and reserve prices and quantities for the settlement interval corresponding to that dispatch period:

\[
\text{MEP}_h^m = \text{market energy price (in \$/MWh) at MNN m for settlement interval } h
\]

\[
\text{USEP}_h = \text{uniform Singapore energy price (in \$/MWh) at the SHUB for settlement interval } h
\]

\[
\text{MRP}_{r,h} = \text{market reserve price (in \$/MWh) for reserve from reserve provider group } r \text{ for settlement interval } h
\]

\[
\text{GRQ}_{r,h}^m = \text{generation registered facility reserve quantity (in MWh) of reserve from reserve provider group } r \text{ for GRF m for settlement interval } h
\]
\[ \text{IEQ}_{h}^{m(a)} = \text{injection energy quantity (in MWh) for } IRF \ m(a) \ associated \ with \ settlement \ account \ a \ for \ settlement \ interval \ h, \ as \ determined \ by \ the \ EMC \ in \ accordance \ with \ the \ applicable \ market \ manual.} \]

\[ \text{LRQ}_{r,h}^{a} = \text{load registered facility reserve quantity (in MWh) of reserve from reserve provider group } r \text{ for all } LRFs \ associated \ with \ settlement \ account \ a \ for \ settlement \ interval \ h} \]

\[ \text{MFP}_{h} = \text{market regulation price (in $/MWh) for settlement interval} \]

\[ \text{GFQ}_{h}^{m} = \text{generation registered facility regulation quantity (in MWh) for GRF } m \text{ for settlement interval} \]

\[ \text{LCP}_{h} = \text{load curtailment price (in $/MWh) for settlement interval} \]

\[ \text{LCQ}_{h}^{p(a)} = \text{load curtailment quantity (in MWh) for } LRF \ p \ associated \ with \ settlement \ account \ a \ for \ settlement \ interval \ h} \]

**Explanatory Note:** Settlement of energy payments for import registered facilities will be based on their energy schedules. For an import registered facility, its injection energy quantities shall be determined by the EMC from its energy schedules instead of the energy quantities provided by the market support services licensee. The IEQ for import registered facilities is set out in this section 2.2.2, and is determined differently from the IEQ for generation registered facilities or generation settlement facilities.

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2.2.3 Subject to section 1.3, the market support services licensee shall, for each dispatch period, determine and provide the following energy quantities for the settlement interval corresponding to that dispatch period:

\[ \text{IEQ}_{h}^{m(a)} = \text{injection energy quantity (in MWh) for } GRF \ m(a) \ or \ GSF \ m(a) \ associated \ with \ settlement \ account \ a \ for \ settlement \ interval \ h} \]

\[ \text{WEQ}_{h}^{a} = \text{withdrawal energy quantity (in MWh), deemed to be withdrawn at the SHUB by all load associated with settlement account a for settlement interval} \]
WFQ<sub>h</sub><sup>a</sup> = total withdrawal fee quantity (in MWh) for settlement account a for settlement interval h, being the quantity of energy determined as the sum of:

(a) the sum of net withdrawal or net injection energy quantities for every EGF group and its associated load which are associated with settlement account a for settlement interval h; and

(b) withdrawal energy quantity of any other load associated with settlement account a for settlement interval h, which are not associated with any EGF group.

WMQ<sub>h</sub><sup>a</sup> = total withdrawal MEUC quantity (in MWh) for settlement account a for settlement interval h, being the quantity of energy determined as the sum of:

(a) sum of net withdrawal energy quantities for every EGF group and its associated load which are associated with settlement account a for settlement interval h; and

(b) withdrawal energy quantity of any other load associated with settlement account a for settlement interval h, which are not associated with any EGF group;

WPQ<sub>h(sa)</sub> = total withdrawal price quantity (in MWh) determined for the purpose of price neutralisation, being the quantity of energy deemed to be withdrawn at the SHUB for settlement interval h by the associated load for each EGF group associated with settlement account sa.

IIQ<sub>h</sub><sup>i</sup> = net imported intertie quantity (in MWh) flowing into or out of the transmission system due to intertie flows at MNN i for settlement interval h.

WDQ<sub>h</sub><sup>a</sup> = total withdrawal energy quantity (in MWh) determined for the purposes of recovering load curtailment uplift charges, being the quantity of energy withdrawn by all load associated with settlement account a for settlement interval h.

WLQ<sub>h</sub><sup)>p(a)</sup> = withdrawal energy quantity (in MWh) by LRF p associated with settlement account a for settlement interval h.
Explanatory Note: For dispatch periods commencing on or after 28 June 2011, WMQ is required for the EMC to determine the amount of MEUC cost to be charged to a settlement account for a settlement interval. Each EGF group (which is comprised wholly of embedded generation facilities) and their associated load will be charged MEUC cost based on ‘net load’. All other load will be charged MEUC cost based on ‘gross load’.

For dispatch periods commencing on or after 28 June 2011, WFQ is required for the EMC to determine the amount of PSO fee and EMC fee to be charged to a settlement account for a settlement interval. Each EGF group (which is comprised wholly of embedded generation facilities) and their associated load will be charged PSO fee and EMC fee based on “net injection” or “net withdrawal”.

Dispatch periods commencing before 28 June 2011 (and their corresponding settlement intervals) will continue to be subject to the market rules specified in section 1.3 in force before 28 June 2011.

WCQ – the total withdrawal charge quantity (in MWh) – for dispatch periods commencing before 28 June 2011 (and their corresponding settlement intervals) will still need to be determined and provided by the MSSL for the purpose of settlement adjustments for metering errors, as per the process and for the period set out in Appendix 7B (which is approximately one year beginning 28 June 2011).

WDQ – total withdrawal energy quantity (in MWh) – In the Authority’s final determination paper, on “Implementing Demand Response in the National Electricity Market of Singapore” dated 28 October 2013, it was intended for WDQ to comprise the withdrawal energy quantity of all contestable consumers. For dispatch periods commencing before 19 March 2018 (and their corresponding settlement intervals), the WDQ comprises the withdrawal energy quantity of all contestable consumers. With the launch of the open electricity market, the Authority has decided to recover load curtailment uplift charges on all consumers instead. For dispatch periods commencing on or after 19 March 2018 (and their corresponding settlement intervals), the WDQ would therefore comprise the withdrawal energy quantity of all consumers, regardless of their contestability status.

2.2.4 The EMC shall, following each dispatch period, determine the reserve responsibility share (RRS) for each GRF or IRF for the settlement interval corresponding to that dispatch period:

\[
RRS_{hm} = \text{share of total reserve costs to be paid by GRF}_m \text{ or IRF}_m, \text{ as determined in accordance with Appendix 7A.}
\]
2.3 **Bilateral Contract Data**

2.3.1 The EMC shall define, and publish in a market manual, procedures and schedules whereby a **selling market participant** may submit **bilateral contract data** (and if submitted, such submission shall be made any time prior to but no later than ten days before the *dispatch day* to which such **bilateral contract data** apply) to the EMC that:

2.3.1.1 define quantities of one or more of energy, regulation and reserve that the **selling market participant** is selling to a **buying market participant** in a specified settlement interval; and

2.3.1.2 identify the **selling market participant’s settlement account** from which the market value of the energy (at the USEP), regulation or reserve being sold is to be debited and the **buying market participant’s settlement account** to which this market value is to be credited.

2.3.2 For the bilateral sale of energy, the **selling market participant** may submit **bilateral contract data** that define a bilateral energy quantity (BEQ) as an absolute amount of energy (in MWh), as a fraction or multiple of a withdrawal energy quantity or an injection energy quantity, or as a combination of these, using the following definitions:

\[
BAQ_{h}^{s,b} = \text{bilateral absolute quantity of energy (in MWh) being sold by the selling market participant and debited from the selling market participant’s settlement account } s \text{ to the buying market participant and credited to the buying market participant’s settlement account } b \text{ at the SHUB for settlement interval } h, \text{ with } BAQ_{h}^{s,b} \geq 0
\]

\[
BWF_{h}^{s,b} = \text{bilateral withdrawal fraction indicating the fraction of the total withdrawal energy quantity in the buying market participant’s settlement account } b \text{ (WEQ}_{h}^{b}) \text{ that is to be credited to that settlement account } b \text{ and debited from the selling market participant’s settlement account } s \text{ at the SHUB for settlement interval } h, \text{ with } BWF_{h}^{s,b} \geq 0
\]

\[
BIF_{h}^{s,b} = \text{bilateral injection fraction indicating the fraction of the total injection energy quantity in the selling market participant’s settlement account } s \text{ (IEQ}_{h}^{s}) \text{ that is to be credited to the buying market participant’s settlement account } b \text{ at the SHUB for settlement interval } h, \text{ with } BIF_{h}^{s,b} \geq 0
\]
2.3.3 The *EMC* shall use properly submitted *bilateral contract data* to compute bilateral *energy* quantities (BEQ, in MWh) in accordance with the following formula:

\[
BEQ_{h}^{s,b} = BAQ_{h}^{s,b} + BWF_{h}^{s,b} \times WEQ_{h}^{b} + BIF_{h}^{s,b} \times IEQ_{h}^{s}
\]

2.3.4 For the bilateral sale of *regulation*, the *selling market participant* may submit *bilateral contract data* that define a bilateral *regulation* quantity (BFQ, in MWh) using the following definition:

\[
BFQ_{h}^{s,b} = \text{bilateral regulation quantity (in MWh) of regulation being sold by the selling market participant and debited from the selling market participant’s settlement account s to the buying market participant’s settlement account b in settlement interval h}
\]

2.3.5 For the bilateral sale of *reserve* from *reserve provider group* r, the *selling market participant* may submit *bilateral contract data* that define a bilateral *reserve* quantity (BRQ, in MWh) using the following definition:

\[
BRQ_{r,h}^{s,b} = \text{bilateral reserve quantity (in MWh) of reserve from reserve provider group r being sold by the selling market participant and debited from the selling market participant’s settlement account s to the buying market participant’s settlement account b in settlement interval h}
\]

2.3.6 No bilateral *energy* quantities, bilateral *regulation* quantities or bilateral *reserve* quantities determined in accordance with this section 2.3 shall be used by the *EMC* for any purpose under these *market rules* other than for *settlement* purposes in accordance with this Chapter.

2.3.7 The *EMC* shall be entitled to and shall rely on any *bilateral contract data* submitted by a *selling market participant* for determining *settlement amounts* in accordance with this Chapter and, notwithstanding section 13 of Chapter 1:

2.3.7.1 the *EMC* shall not be required to inform a *buying market participant* of the receipt or use of such *bilateral contract data* other than in the ordinary course of determining and reporting *settlement amounts*;

2.3.7.2 the *EMC* shall not be liable to any person in respect of or arising from the use of such *bilateral contract data* where effected by the *EMC* in accordance with this Chapter; and
2.3.7.3 the selling market participant submitting such bilateral contract data shall indemnify and hold harmless the EMC in respect of any and all claims, losses, costs, liabilities, obligations, actions, judgements, suits, expenses, disbursements and damages incurred, suffered, sustained or required to be paid, directly or indirectly, by, or sought to be imposed upon, the EMC arising from the use of such bilateral contract data where effected by the EMC in accordance with this Chapter.

2.4 FINANCIAL TRANSMISSION RIGHT QUANTITIES

Explanatory Note: There will be no allocation of FTRs as part of the vesting of rights. While the following rules describe the settlement of the FTR market in the event that such an allocation is made in the future, these rules do not address the precise structure of such rights.

Once allocated, each generator would hold financial transmission rights (FTRs) from its MNN to the SHUB, with the quantity based on its historical production during constrained periods. While the initial allocation of FTRs will not be the responsibility of the EMC (or MSSL) the EMC would maintain a register of FTR ownership and provide for the transfer of FTR ownership among settlement accounts. The FTR quantities in the FTR register will not vary by settlement interval, but the EMC will from time to time change these quantities to reflect sales of FTRs among market participants or changed transmission capacity.

Because FTRs do not vary by settlement interval, there is no need for a subscript “h” on the FTR quantities in the register – although this does require that changes in FTR quantities are made only between the periods over which settlement amounts are aggregated.

2.4.1 The EMC shall establish and maintain an FTR register that contains current values for the following data for all MNNs and all settlement accounts:

\[
FTQ^{m,a} = \text{quantity (in MWh) of FTRs from } MNN \text{ } m \text{ to the SHUB associated with settlement account } a
\]

2.4.2 The EMC shall from time to time make changes in the quantities recorded in the FTR register in the circumstances referred to in this section 2.4 in accordance with such procedures and schedules as may be specified in the applicable market manual.

2.4.3 Two market participants may jointly specify a quantity of FTRs from any MNN m to the SHUB and request that the EMC add this quantity of FTRs to the FTR register entry for the settlement account associated with one of the market participants and subtract this same quantity of FTRs from the
FTR register entry for the settlement account associated with the other market participant.

2.4.4 The EMC shall, upon receipt of a request referred to in section 2.4.3 and after verifying the validity of the request in accordance with the applicable market manual, change the FTR register accordingly, with such changes to become effective at a time specified by the EMC in accordance with the applicable market manual.

2.4.5 The EMC shall be entitled to and shall rely on any request submitted by market participants pursuant to section 2.4.3 for determining settlement amounts in accordance with this Chapter and, notwithstanding section 13 of Chapter 1:

2.4.5.1 the EMC shall not be required to inform any person of the receipt of such request or of any change in the FTR register other than in the ordinary course of determining and reporting settlement amounts or as may be required by the applicable market manual for purposes of the verification referred to in section 2.4.4;

2.4.5.2 the EMC shall not be liable to any person in respect of or arising from any change in the FTR register where such change was effected by the EMC in accordance with this Chapter; and

2.4.5.3 the market participants submitting such request shall be jointly and severally liable to indemnify and hold harmless the EMC in respect of any and all claims, losses, costs, liabilities, obligations, actions, judgements, suits, expenses, disbursements and damages incurred, suffered, sustained or required to be paid, directly or indirectly, by, or sought to be imposed upon, the EMC arising from the associated change in the FTR register where such change was effected by the EMC in accordance with this Chapter.

2.4.6 Section 2.4 shall come into force on a date to be published by the EMC.

2.5 Vesting Contract Data

Explanatory Note: It is assumed that there will only ever be one MSSL that deals with the EMC for the purpose of settling vesting contracts with generators and that no assignment of these contracts will be permitted by the MSSL. This MSSL will be a party to vesting contracts with generators that are intended both to control generator market power and to hedge consumers against “uncontrollable” variations in the USEP. The total vesting contract quantity for each generator may comprise one or more of the following vesting quantity or vesting quantities:
The tender vesting quantity, being the vesting quantity awarded by the Authority pursuant to the Authority’s Tendering Regime and subsequently allocated by the MSSL under a vesting contract;

(ii) LNG vesting quantity, being the vesting quantity determined by the Authority pursuant to the Authority’s LNG Vesting Scheme and subsequently allocated by the MSSL under a vesting contract; and

(iii) balance vesting quantity, being the vesting quantity allocated as such by the MSSL under a vesting contract.

“Tendering Regime” means all those agreements and arrangements referred to in the Authority’s final determination paper of “Tendering of a portion of the non-contestable load” circulated to the industry on 26 October 2009 and “LNG Vesting Scheme” means the policy to encourage the uptake of regasified liquefied natural gas (“LNG”) through the existing Vesting Contracts Regime as indicated in the Authority’s final policy of “LNG Vesting Scheme” dated 30 October 2009 and all subsequent notifications by the Authority.

The MSSL will provide the EMC an electronic file containing vesting quantity and vesting price information for each settlement interval and for each vesting contract generator settlement account for each vesting period (i.e. a calendar quarter).

A generator subject to vesting contracts will receive a positive vesting contract settlement credit when its weighted average MEP (or Vesting Contract Reference Price) is “low” relative to the relevant vesting prices in the vesting contract, and the MSSL will receive a corresponding negative vesting contract settlement credit. Conversely, the generator will receive a negative vesting contract settlement credit when its weighted average MEP (or Vesting Contract Reference Price) is “high” relative to the relevant vesting prices in the vesting contract, and the MSSL will receive a corresponding positive vesting contract settlement credit.

The MSSL will determine the expected cost of these vesting contract payments to generators before the beginning of the 3 month period, modifying this by any shortfall or surplus between what it expected to pay and what it actually paid in the previous 3 months, and will use this information to determine a uniform price for non-contestable consumers and a partial hedge for contestable consumers. Contestable consumers will receive a hedge as it is likely that the required level of contracting of generators to manage market power will exceed the total level of non-contestable load.

2.5.1 The PSO and the EMC shall, as directed and in such form and at such times as may be specified by the Authority, provide to the MSSL counterparty such data as the Authority may specify as being necessary for the determination by the MSSL counterparty of vesting quantities and
vesting prices under each vesting contract in accordance with section 2.5.2.

2.5.2 The MSSL counterparty shall, in accordance with such procedures and at such times as may be specified in the applicable vesting contract, determine for each settlement account associated with a market participant that is subject to a vesting contract, each vesting quantity (with its associated vesting price) for that settlement account for each settlement interval in the vesting period as follows:

\[
\begin{align*}
BVQ_{h,a} &= \text{balance vesting quantity (in MWh) allocated for settlement interval } h \text{ for settlement account } a \\
BVP_{h,a} &= \text{balance vesting price (in $/MWh) associated with a given balance vesting quantity allocated for settlement interval } h \text{ for settlement account } a \\
LVQ_{h,a} &= \text{LNG vesting quantity (in MWh) allocated for settlement interval } h \text{ for settlement account } a \\
LVP_{h,a} &= \text{LNG vesting price (in $/MWh) associated with a given LNG vesting quantity allocated for settlement interval } h \text{ for settlement account } a \\
TVQ_{h,b,a} &= \text{tender vesting quantity (in MWh) allocated for settlement interval } h \text{ for settlement account } a, \text{ for tender tranche } b \\
TVP_{h,b,a} &= \text{tender vesting price (in $/MWh) associated with a given tender vesting quantity allocated for settlement interval } h \text{ for settlement account } a, \text{ for tender tranche } b
\end{align*}
\]

where “tender tranche” means a tranche in a tender called by the Authority pursuant to the Tendering Regime for the supply of energy for non-contestable load.

2.5.3 The MSSL counterparty shall, in accordance with such procedures and at such times as may be specified in the applicable market manual, provide the EMC with an electronic data file containing all relevant vesting quantities and prices referred to in section 2.5.2 pertaining to each vesting contract for a given vesting period. Such vesting contract data shall describe, for each vesting contract, each relevant vesting quantity with its associated vesting price for that settlement account for each settlement interval in the vesting period.

2.5.4 Following receipt of the vesting contract data referred to in section 2.5.3, the EMC shall confirm receipt of such vesting contract data to the MSSL counterparty in accordance with such procedures and within such time as
may be specified in the applicable market manual. The EMC shall use such vesting contract data to determine vesting contract settlement credits in accordance with section 3.6.1.

2.5.5 Where required, the MSSL counterparty may, in accordance with such procedures and within such time as may be specified in the applicable market manual, submit to the EMC revisions to any vesting contract data previously submitted by the MSSL counterparty pursuant to section 2.5.3 or this section 2.5.5. Section 2.5.4 shall apply, mutatis mutandis, to any such revised vesting contract data.

2.5.6 The EMC shall be entitled to and shall rely on any vesting contract data submitted by the MSSL counterparty pursuant to section 2.5.3 or 2.5.5 for determining settlement amounts in accordance with this Chapter and, notwithstanding section 13 of Chapter 1:

2.5.6.1 the EMC shall not be required to inform any person of the receipt of such vesting contract data other than in the ordinary course of determining and reporting settlement amounts;

2.5.6.2 the EMC shall not be liable to any person in respect of or arising from the use of such vesting contract data where effected by the EMC in accordance with this Chapter; and

2.5.6.3 the MSSL counterparty submitting such vesting contract data shall be liable to indemnify and hold harmless the EMC in respect of any and all claims, losses, costs, liabilities, obligations, actions, judgments, suits, expenses, disbursements and damages incurred, suffered, sustained or required to be paid, directly or indirectly, by, or sought to be imposed upon, the EMC arising from use of such vesting contract data where effected by the EMC in accordance with this Chapter.

2.6 RESERVE AND REGULATION NON-PROVISION EVENT

2.6.1 Where the PSO suspects that a non-provision event may have occurred in respect of a market participant, the PSO may inform that market participant of the PSO’s suspicion and request such information from that market participant as the PSO deems necessary to determine whether a non-provision event has occurred.

2.6.2 A market participant shall, where it receives a request for information from the PSO pursuant to section 2.6.1, provide the PSO with such information as the PSO has requested for, no later than 2 business days after the PSO’s request.
2.6.3 The PSO shall use its best endeavours to notify not later than 5.00pm on the fifth business day after a given trading day:

2.6.3.1 the EMC of all non-provision events which occurred in that given trading day, in the form prescribed in the applicable market manual; and

2.6.3.2 each market participant of each non-provision event which occurred in that given trading day in respect of that market participant.

2.7 [DELETED AND INTENTIONALLY LEFT BLANK]

2.8 LOAD NON-CURTAILMENT EVENT

2.8.1 A non-curtailment event in a given dispatch period in respect of an LRF with REB is deemed to have occurred if, for the given dispatch period:

2.8.1.1 the LRF with REB has been deemed to be a deviating load registered facility pursuant to section 3.6.3 of Chapter 5; or

2.8.1.2 the LRF with REB was subject to load curtailment but failed to do so, which would be the case if:

\[ \text{OIEC}_{p,h} - \text{WLQ}_{p,h} < \text{LCQ}_{p,h} \]

where:

\[
\text{OIEC}_{p,h} = \text{offered implied energy consumption quantity of that LRF with REB for the given dispatch period h, determined in accordance with section L.2.2 of Appendix 6L} \\
\text{WLQ}_{p,h} = \text{withdrawal energy quantity for that LRF with REB, for the settlement interval corresponding to the given dispatch period h, received from the market support services licensee in accordance with section 2.2.3} \\
\text{LCQ}_{p,h} = \text{load curtailment quantity of that LRF with REB, for the given dispatch period h}
\]

Explanatory Note: It should be noted that section 2.8.1.1 and section 2.8.1.2 are disjunctive. This means that a non-curtailment event could be deemed to have occurred in respect of an LRF with REB for a given dispatch period if either section 2.8.1.1 or section 2.8.1.2 is satisfied. In other words, even if an LRF with REB is not deemed to be a deviating load registered facility for the purposes of section 2.8.1.1, a non-curtailment event can still be deemed to have occurred in respect of that LRF with REB if such LRF with REB satisfies the criteria set out in section 2.8.1.2.
3 NET SETTLEMENT INTERVAL CREDITS

3.1 NET ENERGY SETTLEMENT CREDITS

3.1.1 The EMC shall determine the generation energy settlement credit (GESC) for each settlement account for each settlement interval in accordance with the following formula:

\[
GESC_h^a = \sum_{m(a)} MEP_h^{m(a)} \times IEQ_h^{m(a)}
\]

where:

- \(a\) = a settlement account
- \(h\) = a settlement interval

\(\sum_{m(a)}\) = sum over all GRFs \(m(a)\), IRFs \(m(a)\) and GSFs \(m(a)\) associated with settlement account \(a\)

3.1.2 The EMC shall determine the load energy settlement debit (LESD) applicable to each settlement account for each settlement interval in accordance with the following formula:

\[
LESD_h^a = USEP_h \times WEQ_h^a
\]

where:

- \(a\) = a settlement account
- \(h\) = a settlement interval

Explanatory Note: A WEQ can be negative, indicating that the settlement account includes one or more embedded, non-MSSL-metered generators that, in total, were producing more than all loads in the account were consuming. Because all embedded generators larger than 1MW are GRFs or GSFs and hence must be separately metered by the MSSL, the distortions resulting from ignoring such generators will not be significant.
3.1.3 The EMC shall determine the bilateral energy settlement credit (BESC) applicable to each settlement account for each settlement interval in accordance with the following formula:

\[ BESC_{h,a} = USEP_h \times \sum_j (BEQ_{h,j,a} - BEQ_{h,a,j}) \]

where:

- \( a \) = a settlement account
- \( h \) = a settlement interval
- \( \sum_j \) = sum over all settlement accounts \( j \)

3.1.4 The EMC shall determine the net energy settlement credit (NESC) applicable to each settlement account for each settlement interval in accordance with the following formula:

\[ NESC_{h,a} = GESC_{h,a} - LESD_{h,a} + BESC_{h,a} \]

where:

- \( a \) = a settlement account
- \( h \) = a settlement interval
Explanatory Note: The total cost of regulation in each settlement interval is, in general, allocated on a $/MWh basis across all MWh of consumption plus all MWh of energy produced by each pseudo generation settlement facility and the first CSZ produced by each generation registered facility, import registered facility and generation settlement facility (that is not classified as a pseudo generation settlement facility) in that settlement interval.

CSZ is the critical size and is 5 MWh, the maximum output of a 10 MW unit in a half-hour settlement interval.

Units that are not Secondary Contingency Units and are scheduled for less than 10 MW of energy do not pay a share of reserve costs under the “modified runway formula” used to allocate reserve costs to generators as defined in Appendix 7A.

In accordance with the Authority’s final determination paper titled “Enhancements to the Regulatory Framework for Intermittent Generation Sources in the National Electricity Market of Singapore” dated 25 July 2017, an exception is made for, among others, all residential contestable consumers with embedded intermittent generation facilities that, together with all other intermittent generation facilities directly or indirectly connected to a given substation for the purposes of supplying electricity to a given contestable consumer, have an aggregate name-plate rating of below 1 MW. If such embedded intermittent generation facilities of residential contestable consumers are registered with a market support services licensee and comprised in a pseudo generation settlement facility, net AFP treatment will be granted to the EGF group associated with such pseudo generation settlement facility, where only the net withdrawal or net injection energy quantities, as represented by WFQ and as determined by the market support services licensee, will be allocated regulation costs.

3.2 **Net Regulation Settlement Credits**

3.2.1 The **EMC** shall determine the *regulation settlement credit* (FSC) for each *settlement account* for each *settlement interval* in accordance with the following formula:

\[
FSC_{h}^{a} = MFP_{h} \times GFQ_{h}^{a}
\]

where:

\( a = \text{a settlement account} \)  
\( h = \text{a settlement interval} \)

3.2.2 The allocated *regulation price* (AFP, in $/MWh) for a *settlement interval* shall be the sum of the cost of *regulation* (FSC, in $) over all *settlement accounts* divided by the sum of total energy subject to *regulation* charges.
(FEQ, in MWh) over all settlement accounts in that settlement interval, and shall be determined in accordance with the following formula:

\[ AFP_h = \frac{\sum_i FSC_{h,i}}{\sum_j FEQ_{h,j}} \]

where:

- \( h \) = a settlement interval
- \( \Sigma_i \) = sum over all settlement accounts \( i \)
- \( \Sigma_j \) = sum over all settlement accounts \( j \)

\( FEQ_{h,j} \) = total energy (in MWh) associated with settlement account \( j \) that is subject to regulation payments for settlement interval \( h \), determined in accordance with sections 3.2.2.1 to 3.2.2.3

3.2.2.1 For a settlement account which is not associated with any pseudo generation settlement facility:

\[ FEQ_{h,a} = WEQ_{h,a} + \sum_{m(a)} \left| \text{MIN}[IEQ_{h,m(a)}, \text{CSZ}] \right| \]

where:

- \( a \) = a settlement account which is not associated with any pseudo generation settlement facility
- \( h \) = a settlement interval
- \( \Sigma_{m(a)} \) = sum over all MNNs \( m(a) \) of GRFs, IRFs and GSFs associated with settlement account \( a \)
- \( \text{MIN}[X,Y] = \) Minimum of \( X \) or \( Y \)
- \( [X] = \) positive value for a real number, disregarding the sign
- \( \text{CSZ} = \) the cut-off size (in MWh) described in Appendix 7A

3.2.2.2 For a settlement account which is associated with a pseudo generation settlement facility and net AFP treatment is not granted to the EGF group to which such pseudo generation settlement facility is assigned:

\[ FEQ_{h,a} = WEQ_{h,a} + \sum_{m(a)} | IEQ_{h,m(a)} | \]
where:

\[ a = \text{a settlement account which is associated with a pseudo generation settlement facility and net AFP treatment is not granted to the EGF group to which such pseudo generation settlement facility is assigned} \]

\[ h = \text{a settlement interval} \]

\[ \Sigma_{n(a)} = \text{sum over all MNNs n(a) of pseudo generation settlement facilities associated with settlement account a} \]

\[ |X| = \text{positive value for a real number, disregarding the sign} \]

3.2.2.3 For a settlement account which is associated with a pseudo generation settlement facility and net AFP treatment has been granted under section 5.5A.4 of Chapter 2 to the EGF group to which such pseudo generation settlement facility is assigned:

\[ \text{FEQ}_h^a = \text{WFQ}_h^a \]

where:

\[ a = \text{a settlement account which is associated with a pseudo generation settlement facility and net AFP treatment has been granted to the EGF group to which such pseudo generation settlement facility is assigned} \]

\[ h = \text{a settlement interval} \]

3.2.3 The EMC shall determine the regulation settlement debit (FSD) for each settlement account for each settlement interval in accordance with the following formula:

\[ \text{FSD}_h^a = \text{AFP}_h \times \text{FEQ}_h^a \]

where:

\[ a = \text{a settlement account} \]

\[ h = \text{a settlement interval} \]

3.2.4 The EMC shall determine the regulation contract credit (FCC) for each settlement account for each settlement interval in accordance with the following formula:
FCC$_{h,a} = MFP_h \times \sum_j (BFQ_{h,i}^{a,j} - BFQ_{h}^{a,j})$

where:

- $a = a$ settlement account
- $h = a$ settlement interval
- $\sum_j$ = sum over all settlement accounts $j$

3.2.5 The EMC shall determine the net regulation settlement credit (NFSC) for each settlement account for each settlement interval in accordance with the following formula:

NFSC$_{h,a} = FSC_{h,a} - FSD_{h,a} + FCC_{h,a}$

where:

- $a = a$ settlement account
- $h = a$ settlement interval

3.3 NET RESERVE SETTLEMENT CREDITS

3.3.1 The EMC shall determine the reserve settlement credit (RSC) for each reserve provider group $r$ for each settlement account for each settlement interval in accordance with the following formula:

RSC$_{r,h,a} = MRP_{r,h} \times (\sum_{m(a)} \text{GRQ}_{r,h,m(a)} + \text{LRQ}_{r,h,a})$

where:

- $r = a$ reserve provider group
- $a = a$ settlement account
- $h = a$ settlement interval
- $\sum_{m(a)}$ = sum over all MNNs $m(a)$ associated with settlement account $a$

3.3.2 The EMC shall determine the reserve settlement debit (RSD) for each settlement account for each settlement interval in accordance with the following formula:
\[ RSD_{h}^{a} = \sum_{m(a)} RRS_{h}^{m(a)} \times \sum_{j} \sum_{r} RSC_{r,h}^{j} \]

where:

\[ RRS_{h}^{m(a)} = \text{reserve responsibility share for GRF } m(a) \text{ for settlement interval } h \text{ as determined in accordance with Appendix 7A} \]

\[ h = \text{a settlement interval} \]

\[ \sum_{m(a)} = \text{sum over all GRFs } m(a) \text{ associated with settlement account } a \]

\[ \sum_{r} = \text{sum over all reserve provider groups } r \]

\[ \sum_{j} = \text{sum over all settlement accounts } j \]

3.3.3 The EMC shall determine the reserve contract credit (RCC) for each reserve provider group for each settlement account for each settlement interval in accordance with the following formula:

\[ RCC_{r,h}^{a} = MRP_{r,h} \times \sum_{j} (BRQ_{r,h}^{j,a} - BRQ_{r,h}^{a,j}) \]

where:

\[ a = \text{a settlement account} \]

\[ h = \text{a settlement interval} \]

\[ r = \text{a reserve provider group} \]

\[ \sum_{j} = \text{sum over all settlement accounts } j \]

3.3.4 The EMC shall determine the net reserve settlement credit (NRSC) for each settlement account for each settlement interval in accordance with the following formula:

\[ NRSC_{h}^{a} = \sum_{r} (RSC_{r,h}^{a} + RCC_{r,h}^{a}) - RSD_{h}^{a} \]

where:

\[ a = \text{a settlement account} \]

\[ h = \text{a settlement interval} \]

\[ \sum_{r} = \text{sum over all reserve provider groups } r \]
3.4 **NET TRANSMISSION RIGHTS SETTLEMENT CREDITS**

3.4.1 The *EMC* shall determine the net financial transmission right settlement credit (NTSC) for each *settlement account* for each *settlement interval* in accordance with the following formula:

\[
NTSC_h^a = \sum_m \{FTQ_h^{m,a} \times (USEP_h - MEP_h^m)\}
\]

where:

- \(a\) = a *settlement account*
- \(h\) = a *settlement interval*
- \(\sum_m\) = sum over all MNNs \(m\)

**Explanatory Note:** The NTSC may be positive or negative for any settlement account/generator, i.e., generators located where the nodal price exceeds the USEP will have to pay the difference multiplied by their FTR quantities. If FTR holdings are approximately equal to actual generation during constrained periods, total NTSC payments to generators should be positive and should approximate the constraint-related component of the settlement surplus.

3.4A **NET LOAD CURTAILMENT SETTLEMENT CREDIT**

3.4A.1 The *EMC* shall determine the net load curtailment settlement credit (LCSC) for each *settlement account* for each *settlement interval* in accordance with the following formula:

\[
LCSC_h^a = LCP_h \times \sum_pLCQ_h^{p(a)}
\]

where:

- \(a\) = a *settlement account*
- \(h\) = a *settlement interval*
- \(\sum_p\) = sum over all LRFs \(p\) associated with *settlement account* \(a\)

3.4A.2 The hourly *load curtailment uplift* (HLCU, in $/MWh) for a *settlement interval* shall be the total over all *settlement accounts* of the cost of load curtailment (LCSC, in $) for that *settlement interval*, divided by, the aggregate of the *energy* withdrawn (in MWh) by all *load* over all *settlement accounts* for that *settlement interval*, determined in accordance with the following formula:

\[
HLCU_h = \sum_a \frac{LCSC_h^a}{\sum_a WDQ_h^a}
\]
where:

\( a = \text{a settlement account} \)

\( h = \text{a settlement interval} \)

\( \sum_a = \text{sum over all settlement accounts} \)

### 3.5 **SETTLEMENT INTERVAL ENERGY UPLIFT CHARGES**

#### 3.5.1

The EMC shall determine the settlement interval energy uplift amount (HEUA) for each settlement interval in accordance with the following formula:

\[
\text{HEUA}_h = \sum_a (\text{NESC}_h^a + \text{NRSC}_h^a + \text{NTSC}_h^a + \text{NFSC}_h^a + \text{NMEA}_h^a)
\]

where:

\( a = \text{settlement account} \)

\( h = \text{settlement interval} \)

\( \sum_a = \text{sum over all settlement accounts} \)

\( \text{NMEA}_h^a = \text{net metering error adjustment for settlement account} \) computed in accordance with Appendix 7B.

#### 3.5.2

The EMC shall determine the hourly energy uplift rebate (HEUR) for each settlement interval in accordance with the following formula:

\[
\text{HEUR}_h = \frac{\text{HEUA}_h}{\sum_a \text{WEQ}_h^a}
\]

where:

\( h = \text{settlement interval} \)

\( \sum_a = \text{sum over all settlement accounts} \)

#### 3.5.2A

The EMC shall determine the hourly energy uplift charge (HEUC) for each settlement interval in accordance with the following formula:

\[
\text{HEUC}_h = \text{HEUR}_h + \text{HLCU}_h
\]

where:

\( h = \text{settlement interval} \)
3.5.3 Subject to section 1.3, the EMC shall, prior to the start of each calendar month, estimate the monthly energy uplift charge (MEUC) for the immediately following calendar month in accordance with section 4.1.

\[
\text{MEUC} = \text{the charge (in $/MWh) to recover the costs estimated to be incurred by the EMC in respect of the elements referred to in sections 4.1.1 to 4.1.6, adjusted to reflect any over- or under-recovery in the MEUC applied in the previous month. The MEUC shall be applied in a constant manner over all settlement intervals in the calendar month.}
\]
3.6 **VESTING CONTRACT SETTLEMENT CREDITS**

3.6.1 The EMC shall determine the *vesting contract settlement* credit (VCSC) for each *settlement account* for each *settlement interval* in accordance with the following formula:

\[
\text{VCSC}_{h}^{a} = \left( \text{LVP}_{h}^{a} - \text{VCRP}_{h}^{a} \right) \times \text{LVO}_{h}^{a} + \left( \text{BVP}_{h}^{a} - \text{VCRP}_{h}^{a} \right) \times \text{BVQ}_{h}^{a} + \\
\sum_{h=1}^{n} \left[ \left( \text{TVP}_{h,b}^{a} - \text{VCRP}_{h}^{a} \right) \times \text{TVQ}_{h,b}^{a} \right]
\]

for all \( a \neq k \)

where:

\[
\text{VCRP}_{h}^{a} = \sum_{m(a)} \text{MEP}_{h,m(a)} \times \text{MAX}[\text{IEQ}_{h,m(a)}, 0] / \sum_{m(a)} \text{MAX}[\text{IEQ}_{h,m(a)}, 0]
\]

= Vesting Contract Reference Price (VCRP) for *settlement interval* \( h \) for *settlement account* \( a \), and

if \( \sum_{m(a)} \text{MAX}[\text{IEQ}_{h,m(a)},0] = 0 \), then \( \text{VCRP}_{h}^{a} \) equals to the simple average of its MEPs.

\[
\text{MAX}[\text{IEQ}_{h,m(a)}, 0] = \text{maximum of IEQ}_{h,m(a)} \text{ or } 0
\]

\( a = \) a *settlement account*

\( b = \) a tender tranche as defined in section 2.5.2

\( h = \) a *settlement interval*

\( k = \) the *settlement account* associated with the MSSL counterparty

\( \sum_{m(a)} = \text{sum over all GRFs } m(a) \text{ and GSFs } m(a) \text{ associated with settlement account } a \)

**Explanatory Note:** \( \text{VCRP}_{h}^{a} \) is infinite when the sum of \( \text{MAX}[\text{IEQ}_{h,m(a)}, 0] \) is zero. In this instance, the \( \text{VCRP}_{h}^{a} \) will be the simple average of the settlement account’s MEPs.
VCSC₇₉₅ = −∑ₐₜₖ VCSC₇₉ₕ

where:

a = a settlement account

h = a settlement interval

k = the settlement account associated with the MSSL counterparty

Explanatory Note: To enable the MSSL to allocate VCSC₇₉₅ among the relevant parties, the EMC will compute a uniform vesting contract reference price for the MSSL’s VCRP₇ₙₖ as follows:

VCRP₇ₙₖ = \sumₗ₉₈ \left[ \text{VCRP}₇ₙₖ \left( \text{LVQ}ₙₖ + \text{BVQ}ₙₖ \right) \right] \over \sumₗ₉₈ (\text{LVQ}ₙₖ + \text{BVQ}ₙₖ)

3.7 Net Settlement Interval Credits

3.7.1 Subject to section 1.3, the EMC shall determine the net account settlement credit (NASC) for each settlement account for each settlement interval in accordance with the following formula:

NASCₐₙₑₕ = NESCₐₙₑₕ + NFSCₐₙₑₕ + NRSCₐₙₑₕ + LCSCₐₙₑₕ + NTSCₐₙₑₕ + VCSCₐₙₑₕ − (HEUR₇ₙₑₕ × WEQₐₙₑₕ) − (MEUC × WMQₐₙₑₕ) − (HLCU₇ₙₑₕ × WDQₐₙₑₕ)

where:

a = a settlement account

h = a settlement interval

Explanatory Note: The above definition allocates uplift based on consumption net only of any unmetered generation. Because all generators larger than 1 MW must be registered, at least for settlements purposes, and hence must be metered, this is as close to a gross-load allocation as one can realistically get. The uplift amount should not be large (and may even be negative), given that congestion is priced, FTRs, once made available, should redistribute most congestion rentals (except during grid outages), reserve and regulation costs are recovered from generators and loads outside of uplift, and net imports should equal zero over time.
3.7.2 Subject to section 1.3, the EMC shall determine the net participant settlement credit (NPSC) for each market participant and market support services licensee for each settlement interval in accordance with the following formula:

\[ \text{NPSC}_{h}^{k} = \sum_{a(k)} \text{NASC}_{h}^{a(k)} \]

where:

- \( h \) = a settlement interval
- \( k \) = a market participant or market support services licensee
- \( a(k) \) = the settlement account \( a(k) \) associated with market participant or market support services licensee \( k \)
- \( \sum_{a(k)} \) = sum over all settlement accounts \( a(k) \) associated with market participant or market support services licensee \( k \)
4 RECOVERY OF NON-SETTLEMENT-INTERVAL COSTS

4.1 THE MONTHLY ENERGY UPLIFT CHARGE

4.1.1 Prior to the beginning of each calendar month, the EMC shall calculate for that calendar month the monthly amount for compensation and other payments (MACP), which shall be the sum of:

4.1.1.1 an estimate of the amounts that has or may be invoiced by the ancillary service providers under ancillary service contracts;

4.1.1.2 an estimate of the costs that may be incurred by the PSO in testing related to the procurement of ancillary services;

4.1.1.2A an estimate of the costs that may be incurred by the EMC and the Authority in engaging a consultant to conduct any audit and/or services related to the procurement of ancillary services and refurbishment works under sections 8.3.4 and 8.2B of Chapter 5;

4.1.1.2B an estimate of the Authority funding costs that are or may be due or payable to the Authority under the framework agreement;

4.1.1.2C the amount of compensation and/or costs that have been awarded against the Authority under any ancillary service funding agreement, AS financing documents, tripartite agreement and/or framework agreement or otherwise payable by the Authority in connection with the resolution of any disputes or appeals under, arising out of or in connection with any of these contracts (including in connection with any consolidation of proceedings or joinder to any proceedings);

4.1.1.2D an estimate of the costs and expenses (including legal costs and taxes) that are or may be incurred by the Authority to make any claims against, or defend any claims made by, a counterparty to any ancillary service funding agreement, AS financing documents, tripartite agreement and/or framework agreement under, arising out of or in connection with any of these contracts (including in connection with any consolidation of proceedings or joinder to any proceedings);

4.1.1.3 the amounts of compensation claims to be paid by the EMC or the PSO under section 3.11 of Chapter 3, and the compensation amounts to be paid by the EMC under section 10.5 of Chapter 6;
4.1.1.4 the amount of compensation and/or costs that have been awarded against the EMC and/or the PSO under the market rules or otherwise payable by the EMC and/or the PSO in connection with the resolution of any disputes or appeals under, arising out of or in connection with these market rules;

4.1.1.4A the amount of financial penalties to be refunded to market participants pursuant to any award made by an arbitration tribunal under these market rules or as directed by the market surveillance and compliance panel under section D.5.4 of Appendix 5D or section E.5.4 of Appendix 5E or a court in Singapore;

4.1.1.4B the amount of compensation and/or costs that have been awarded against the EMC under any ancillary service contract, tripartite agreement and/or the framework agreement or otherwise payable by the EMC in connection with the resolution of any disputes or appeals under, arising out of or in connection with any of these contracts (including in connection with any consolidation of proceedings or joinder to any proceedings);

4.1.1.4C an estimate of the costs and expenses (including legal costs and taxes) that are or may be incurred by the EMC to make any claims against, or defend any claims made by, a counterparty to any ancillary service contract, tripartite agreement and/or the framework agreement under, arising out of or in connection with any of these contracts (including in connection with any consolidation of proceedings or joinder to any proceedings); and

4.1.1.4D save to the extent that such costs and expenses are set out in the other sub-paragraphs of this section 4.1.1, an estimate of the costs and expenses that are or may be incurred by the EMC in connection with the performance of its obligations (including any payment obligations) under any ancillary service contract, tripartite agreement and/or framework agreement including the costs and expenses (including legal costs and taxes) incurred by the EMC in connection with the preparation, negotiation, printing, and execution of any ancillary service contract, tripartite agreement and/or the framework agreement;

4.1.1.4E the compensation amount referred to under section 3.11A of Chapter 3;

Less the aggregate of:

4.1.1.5 the amount of compensation and/or costs received by the EMC and/or the PSO pursuant to any award made by an arbitration tribunal under these market rules or otherwise received by the
EMC and/or the PSO in connection with the resolution of any disputes or appeals under, arising out of or in connection with these market rules;

4.1.1.5A the amount of ASFA liabilities received by the Authority under any ancillary service funding agreement and/or tripartite agreement (including in the event of termination of an ancillary service funding agreement, the refurbishment cost recovered from an ancillary service provider);

4.1.1.5B the amount of any compensation and/or costs received by the EMC from an ancillary service provider under any ancillary service contract and/or tripartite agreement (including in the event of termination of an ancillary service contract, any refund of payment recovered from an ancillary service provider);

4.1.1.6 the amount received by the EMC in the form of financial penalties imposed by the market surveillance and compliance panel under these market rules and financial penalties imposed by the automatic financial penalty scheme under section 3.6.3 of Chapter 5 and Appendix 5E or under section 3.7.3 of Chapter 5 and Appendix 5D;

4.1.1.7 the amount of insurance monies received by the EMC for any compensation claims awarded against the EMC under these market rules,

4.1.1.8 the amount of fixed market-related charge received by the EMC under sections 5.4B.2 and 5.4B.4 of Chapter 2; and

4.1.1.9 the refund amount referred to under section 3.11A of Chapter 3

4.1.2 [Deleted and Intentionally Left Blank]

4.1.3 Prior to the beginning of each calendar month, EMC shall calculate the monthly transitional payment amount (MTRA), as directed and in the manner specified by the Authority

\[
MTRA = \text{transitional payments (in dollars) for a calendar month}
\]

Explanatory note: The transitional payments are a number of arrangements approved by the EMA for licensees in operation before market start which allow these parties to continue under similar arrangements into the future.

4.1.4 Prior to the beginning of each calendar month, the EMC shall estimate any monthly miscellaneous costs (MISC) that the EMC Board has determined should be recovered through the monthly energy uplift charge in that calendar month.
MISC = estimated miscellaneous costs (in dollars) to be recovered in that calendar month

4.1.5 Prior to the beginning of each calendar month, the EMC shall estimate the monthly energy uplift shortfall (MEUS) to be recovered (if positive) or deducted (if negative) in that calendar month as the aggregate of the over-recovery or the under-recovery of the MEUA in the preceding calendar month.

   MEUS = estimated energy uplift shortfall (in dollars) to be recovered or deducted in that calendar month

4.1.6 Prior to the beginning of each calendar month, the EMC shall determine the monthly energy uplift amount (MEUA) for that calendar month as follows:

   MEUA = MACP + MTRA + MISC + MEUS

4.1.7 Subject to section 1.3, prior to the beginning of each calendar month, the EMC shall project the monthly withdrawal MEUC quantities (MWMQ) for that calendar month.

   MWMQ = projected Σₖ Σₐ WMQₖₐ,

   where:

   Σₖ = sum over all settlement intervals h in a calendar month

   Σₐ = sum over all settlement accounts a

4.1.8 Subject to section 1.3, prior to the beginning of each calendar month, the EMC shall estimate the monthly energy uplift charge (MEUC) for that calendar month as follows:

   MEUC = MEUA/MWMQ

4.1.9 Subject to section 1.3, within 1 business day of the beginning of each calendar month, the EMC shall publish the value established for each of MACP, MTRA, MISC, MEUS and MWMQ for that calendar month.

4.2 EMC AND PSO ADMINISTRATIVE COSTS AND ASSOCIATED FEES

4.2.1 The EMC shall recover its administrative costs in any given EMC fiscal year by means of the imposition of fees on each applicable market participant, market support services licensee and other person. Subject to sections 4.2.2, such fees shall be levied in such manner, at such times, in
such amounts and on such market participants, market support services licensees and other persons as may be specified in:

4.2.1.1 the schedule of fees approved by the Authority for that EMC fiscal year and referred to in section 11.1.5 or 11.1.6 of Chapter 2, as the case may be; or

4.2.1.2 the schedule of fees referred to in section 11.1.5.2(a) of Chapter 2 prepared by the EMC for that EMC fiscal year on the basis of the methodology approved by the Authority pursuant to section 11.1.5 of Chapter 2 for that EMC fiscal year.

4.2.2 Where, in respect of any given EMC fiscal year, the Authority has approved a methodology rather than a schedule of fees pursuant to section 11.1.5 of Chapter 2 and the EMC has not prepared the corresponding schedule of fees referred to in section 4.2.1.2, the EMC shall levy the fees referred to in section 4.2.1 in such manner, at such times, in such amounts and on such market participants, market support services licensees and other persons as may be directed by the Authority or, in the absence of such direction, via electronic funds transfer as initiated by the EMC or by such other means as the EMC determines appropriate on the basis and consistent with the methodology approved by the Authority for that EMC fiscal year.

4.2.3 The EMC shall recover, on behalf of the PSO, the PSO’s administrative costs (referred to in section 12.1.1.1 of Chapter 2) in any Authority fiscal year by means of the imposition of fees on each applicable market participant, market support services licensee and other person. Such fees shall be levied in such manner, at such times, in such amounts and on such market participants, market support services licensees and other persons as may be specified in the then prevailing PSO’s schedule of fees provided by the PSO to the EMC under section 12.1 of Chapter 2 as may be applicable to that Authority fiscal year. Where and to the extent the manner, time or amount of any such fees or the persons on which such fees are to be levied is not specified in such PSO’s schedule of fees, the EMC shall recover such fees in such manner, at such times, in such amounts or on such persons as may be directed by the Authority or, in the absence of such direction, via electronic funds transfer as initiated by the EMC or by such other means as the EMC determines appropriate on the basis of and consistent with such PSO’s schedule of fees.

4.3 Authority Approval

4.3.1 Nothing in this section 4 shall authorise the EMC to recover, in respect of a given charge and over a given period of time, any amount that would result in the recovery by the EMC, other than on behalf of the PSO, of an amount that exceeds, in the aggregate for that period of time, the amount approved for recovery by the Authority for that charge and for that period.
of time where such approval is required to be obtained as a condition of the EMC’s electricity licence.

4.4  **(USEP+HEUC)/NODAL PRICE NEUTRALISATION**

| Explanatory note: This section applies to an EGF group which the EMC is required to grant such price neutralisation under section 5.5 or 5.5A of Chapter 2. Each such EGF group of a market participant or market support services licensee will be associated with a single settlement account of such market participant or market support services licensee. The associated load for such an EGF group may be associated with either the settlement account of such market participant or market support services licensee for that EGF group, the settlement account of another market participant or a combination of two or more such settlement accounts. |

4.4.1 Subject to section 1.3, the provisions of this section 4.4 shall apply only to an EGF group which the EMC is required to grant price neutralisation under section 5.5 or 5.5A of Chapter 2.

4.4.2 Subject to section 4.4.1, for each settlement interval, if the sum of positive injections of an EGF group into the transmission system is less than or equal to its associated load, the EMC shall determine the net energy load credit (NELC) for that group as follows:

\[
\text{NELC}_{h, \text{sa}} = \sum_{m(\text{sa})} [\text{IEQ}_{h,m(\text{sa})} \times (\text{USEP}_{h} + \text{HEUC}_{h} - \text{MEP}_{h,m(\text{sa})})]
\]

where:

- \(\text{sa}\) = the settlement account assigned to that group
- \(h\) = the settlement interval

\(\sum_{m(\text{sa})}\) = sum over all MNNs \(m(\text{sa})\) associated with settlement account \(\text{sa}\), excluding MNNs at which the injection energy quantity for settlement interval \(h\) is negative

4.4.3 Subject to section 4.4.1, for each settlement interval, if the sum of positive injections of an EGF group into the transmission system is greater than its associated load, the EMC shall determine the net energy generation credit (NEGC) for that group in accordance with sections 4.4.3.1 to 4.4.3.4.

4.4.3.1 The EMC shall rank all MNNs associated with the settlement account assigned to that group (excluding MNNs at which the injection energy quantity for the settlement interval is negative) in increasing injection energy quantity at each MNN in the settlement interval, such that:

\[z = \text{the index position of the ranked MNN}\]
Explanatory Note: The ranking of the Market Network Nodes is meant to be used to identify the Market Network Nodes so that allocation of withdrawal quantities to the nodal prices at the respective Market Network Nodes can be done. It is not for indication of any preference shown by ranking. The allocation of the withdrawal quantity to the nodal prices of the Market Network Nodes is based on the IEQs of the Market Network Nodes. The allocation methodology is on a proportionate basis with nodal prices of Market Network Nodes having greater injection quantities being assigned a greater withdrawal quantity, the quantity assigned being the total withdrawal quantity multiplied by the fraction of total injection that is being injected at the particular Market Network Node.

4.4.3.2 The EMC shall determine an index size function $S(z)$ such that:

$$S(z) = \text{injection energy quantity at the MNN ranked at index position } z \text{ under section 4.4.3.1}$$

$$S(z) \leq S(z+1)$$

4.4.3.3 The EMC shall determine $T(z)$ such that:

$$T(z) = \frac{S(z)}{\sum_{j=1}^{Z} S(j)}$$

$Z = \text{total number of MNNs for settlement account } sa$, excluding MNNs at which the injection energy quantity for the settlement interval is negative

4.4.3.4 The EMC shall determine the NEGC for that group for the settlement interval as follows:

$$\text{NEGC}_h^{sa} = \sum_{z=1}^{Z} [T(z) \times (\text{USEP}_h + \text{HEUC}_h - \text{MEP}_h^{m(z)})] \times \text{WPQ}_{h(sa)}$$

where:

$sa = \text{the settlement account associated with that group}$

$h = \text{the settlement interval}$

$Z = \text{total number of MNNs for settlement account } sa$, excluding MNNs at which the injection energy quantity for the settlement interval is negative

$\text{WPQ}_{h(sa)} = \text{associated load for that group}$

4.4.4 Subject to section 4.4.1, the NEGC and NELC determined for each settlement interval of a given trading day and payable to a given market participant or market support services licensee, shall be aggregated and
included in that market participant’s or market support services licensee’s preliminary settlement statement for that trading day.

4.4.5 Subject to section 4.4.1, the EMC shall determine the net energy adjustment amount (NEAA) for each settlement interval as follows:

$$\text{NEAA}_h = \sum_{sa}[\text{NELC}_h^{sa} + \text{NEGC}_h^{sa}]$$

where:

- $h$ = a settlement interval
- $\sum_{sa}$ = sum over the settlement accounts $sa$ of all EGF groups

4.4.6 Subject to section 4.4.1, for each settlement interval, the EMC shall determine the net energy adjustment debit (NEAD) applicable to each market participant or market support services licensee who has withdrawn energy from the transmission system in that settlement interval as follows:

$$\text{NEAD}_{h,a} = \text{NEAA}_h \times \left(\left(\text{WEQ}_h^a - \sum_{sa(a)} \text{R}_{h(sa)}^a\right) / \left(\sum_j \text{WEQ}_h^j - \sum_{sa(l)} \sum_l \text{R}_{h(sa)}^l\right)\right)$$

where:

- $a$ = settlement account of a market participant or market support services licensee who has withdrawn energy in settlement interval $h$
- $h$ = a settlement interval
- $\sum_i$ = sum over all settlement accounts $j$
- $\text{R}_{h(sa)}^a = \min\{\text{WPQ}_{h(sa)}^a, \sum_{m(sa)} \text{IEQ}_{h}^{m(sa)}\}$, if settlement account $a$ is associated with the associated load for an EGF group associated with settlement account $sa$ that is required to be granted price neutralisation under section 5.5 or 5.5A of Chapter 2
- $\text{R}_{h(sa)}^a = 0$, if settlement account $a$ is not associated with any associated load for an EGF group associated with settlement account $sa$ that is required to be granted price neutralisation under section 5.5 or 5.5A of Chapter 2
- $\text{WPQ}_{h(sa)}^a$ = associated load, associated with settlement account $a$, for an EGF group associated with settlement account $sa$ that is required to be granted price neutralisation under section 5.5 or 5.5A of Chapter 2
\[
\sum_{sa(a)} = \text{sum over all settlement accounts } sa \text{ of all } EGF \text{ groups whose associated loads are associated with settlement account } a
\]

\[
\sum_{m(sa)} = \text{sum over all MNNs } m(sa) \text{ associated with settlement account } sa, \text{ excluding MNNs at which the injection energy quantity for settlement interval } h \text{ is negative}
\]

\[
\sum_{l} = \text{sum over all settlement accounts } 1
\]

4.4.7 Subject to section 4.4.1, the NEAD determined for each settlement interval of a given trading day and payable by a given market participant or market support services licensee, shall be aggregated and included in that market participant’s or market support services licensee’s preliminary settlement statement for that trading day.

## 5 SETTLEMENT STATEMENTS

### 5.1 COMMUNICATION OF SETTLEMENT INFORMATION

5.1.1 All communications between market participants and the EMC relating to the settlement process shall be effected using the electronic information system or such other means of communication as may be specified in the applicable market manual.

5.1.2 If there is a failure of a communication system and it is not possible to communicate using the electronic information system or, where applicable, the alternate means of communication specified in the applicable market manual, then the EMC or the market participant, as the case may be, shall communicate information relating to the settlement process by facsimile or other alternative means specified by the EMC.

### 5.2 SETTLEMENT TIMETABLE

5.2.1 The preliminary settlement statement for each trading day in the real-time markets shall be issued six business days after the trading day.

5.2.2 After the preliminary settlement statement referred to in section 5.2.1 is issued, each market participant shall, within three business days and prior to such time as may be specified in the applicable market manual, notify the EMC of errors in the preliminary settlement statement in accordance with section 5.5.
5.2.3 The final settlement statement for each trading day in the real-time markets shall be issued ten business days after each trading day and shall reflect the outcome of the validation procedure undertaken in accordance with section 5.5.

5.2.4 The final settlement statement shall be the basis for invoicing and billing.

5.2.5 At the same time as the EMC issues to a market participant one or more final settlement statements referred to in section 5.2.3, the EMC shall issue a single invoice to that market participant for the trading days to which the final settlement statements relate.

5.2.6 The market participant payment date for each invoice shall be the twentieth day after the trading day subject to business day convention.

5.2.7 The EMC shall initiate the electronic funds transfer process in accordance with the provisions of section 5.10 so as to ensure that the market participant’s payments for each invoice reach the EMC settlement clearing account no later than the close of banking business on the market participant payment date for that invoice. For the avoidance of doubt, a market participant’s payment obligations under section 5.9.1 shall not be discharged merely by the initiation of such electronic funds transfer process by the EMC.

5.2.8 The EMC payment date for each invoice shall be one day after the market participant payment date, subject to business day convention, for that invoice.

5.2.9 The EMC shall initiate the electronic funds transfer process in accordance with the provisions of section 5.10 so as to ensure that the sums owing to each market participant for each invoice reach the market participant’s bank account no later than the close of banking business on the EMC payment date for that invoice.

5.3 Settlemet Statement Process

5.3.1 The EMC shall issue settlement statements to each market participant to cover each trading day in accordance with sections 5.2 and 5.6, and shall include the settlement information described in section 5.4.2 or sections 5.6.2 and 5.6.3, as the case may be.

5.3.2 For each settlement statement, the EMC shall calculate a net settlement amount for each market participant for the trading day. The net settlement amount shall be comprised of the aggregate of the settlement amounts from each transaction in each settlement interval in the trading day, adjusted to reflect any fees payable by the market participant and...
any other adjustment amounts payable or receivable pursuant to these market rules.

5.3.3 The net settlement amount referred to in section 5.3.2 shall be a positive or negative dollar amount for each market participant and:

5.3.3.1 where the net settlement amount for a market participant is negative, the absolute value of the settlement amount shall be an amount payable by the market participant to the EMC; or

5.3.3.2 where the net settlement amount for a market participant is positive, the settlement amount shall be an amount receivable by the market participant from the EMC.

5.3.4 Settlement statements shall be considered issued to market participants when released in accordance with the applicable market manual.

5.3.5 It is the responsibility of each market participant to notify the EMC if it fails to receive, or it is unable to access and obtain, a settlement statement on a given business day in the manner specified in the applicable market manual. Each market participant shall be deemed to have received a given settlement statement on the business day on which the settlement statement has been made available in accordance with section 5.3.4, unless it notifies the EMC to the contrary in accordance with the applicable market manual.

5.3.6 In the event that a market participant notifies the EMC that it has failed to receive, or it is unable to access and obtain, a settlement statement in accordance with the applicable market manual, the EMC shall re-release or make available the settlement statement, in which case the settlement statement shall be considered to have been issued and received on the date such settlement statement is re-released or made available to the market participant by the EMC.

5.4 PRELIMINARY STATEMENT COVERAGE

5.4.1 In accordance with the timelines set forth in section 5.2.1, the EMC shall issue preliminary settlement statements to each market participant to cover transactions in the real-time markets.

5.4.2 Preliminary settlement statements related to each market participant for the real-time markets shall include, in electronic format, for the relevant trading day:

5.4.2.1 the aggregate energy produced or withdrawn by each of that market participant’s registered facilities and generation
settlement facilities in each settlement interval in that trading day;

5.4.2.2 the aggregate reserve provided in respect of each reserve provider group by that market participant’s registered facilities in each settlement interval in that trading day;

5.4.2.3 the aggregate regulation provided by that market participant’s registered facilities in each settlement interval in that trading day;

5.4.2.4 the aggregate adjustment amounts payable or receivable pursuant to these market rules;

5.4.2.5 the bilateral energy quantities for that market participant in each settlement interval in that trading day;

5.4.2.6 the bilateral reserve quantities in respect of reserve from each reserve provider group for that market participant in each settlement interval in that trading day;

5.4.2.7 the bilateral regulation quantities for that market participant in each settlement interval in that trading day;

5.4.2.8 the credits and charges associated with FTRs applying to a market participant’s settlement account in each settlement interval in that trading day;

5.4.2.9 the energy price applying to each of that market participant’s registered facilities and generation settlement facilities in each settlement interval in that trading day;

5.4.2.10 the reserve price in respect of reserve from each reserve provider group applicable to that market participant’s registered facilities in each settlement interval in that trading day;

5.4.2.11 the regulation price applying to that market participant’s registered facilities in each settlement interval in that trading day;

5.4.2.12 all vesting prices and vesting quantities, referred to in section 2.5 applying to each applicable market participant’s settlement account in each settlement interval in that trading day;

5.4.2.13 the monthly energy uplift charge and the hourly energy uplift charge to be applied per MWh in each settlement interval in that trading day;

5.4.2.14 [Deleted and Intentionally Left Blank]
5.4.2.15 the total of each type of non-interval settlement charge or credit allocated to that trading day and the market participant’s share;

5.4.2.16 all taxes, fees, levies, charges and payments applicable to the market participant; and

5.4.2.17 for each type of charge listed, the total trading day’s charges.

The basis for deriving the market participant’s share of each type of non-interval settlement charge or credit under section 5.4.2.15 shall be communicated to each market participant in accordance with section 5.1 of Chapter 7.

5.5 VALIDATION OF PRELIMINARY SETTLEMENT STATEMENT

5.5.1 Each market participant shall have the opportunity to review its preliminary settlement statements. A market participant may register a disagreement with the EMC with respect to any such preliminary settlement statement in accordance with the timelines set forth in section 5.2.2 and the other provisions of this section 5.5.

5.5.2 Subject to sections 5.5.8 and 5.5.9, if a market participant disagrees with any item or calculation set forth in a preliminary settlement statement that it has received, it may provide the EMC with a notice of disagreement in such form as may be specified in the applicable market manual which shall clearly state, with supporting material, the nature of the disagreement and a proposed resolution of it. Such notice of disagreement shall relate to only one preliminary settlement statement and shall include at least the following information:

5.5.2.1 the date of issuance of the preliminary settlement statement in question;

5.5.2.2 the trading day in question;

5.5.2.3 the item(s) in question;

5.5.2.4 the reason(s) for the disagreement;

5.5.2.5 where applicable, the proposed adjustment to the data used to calculate any relevant settlement amount on the preliminary settlement statement; and

5.5.2.6 where applicable, the proposed correction to any calculation of the relevant settlement amount on the preliminary settlement statement.

5.5.3 Where a notice of disagreement includes a proposed adjustment to bilateral energy quantities, bilateral reserve quantities, FTR quantities or
vesting contract quantities referred to in section 2.5 which will impact the allocation of quantities between market participants, the EMC shall notify any other directly affected market participant of such proposed adjustment prior to taking any action under section 5.5.6.

5.5.4 The notice of disagreement issued by the market participant shall be acknowledged by the EMC upon receipt.

5.5.5 Subject to sections 5.5.8 and 5.5.9, the EMC shall investigate the subject-matter of, and reach a final determination on, the disagreement specified in a notice of disagreement no later than 15 business days after the issuance of the corresponding final settlement statement (i.e. the final settlement statement that corresponds to the preliminary settlement statement referred to in the notice of disagreement). If the final determination is not reached before the time for issuing the corresponding final settlement statement, the EMC may issue that final settlement statement without taking into account the disagreement in the notice of disagreement.

5.5.6 Before reaching a final determination on the disagreement specified in a market participant’s notice of disagreement, the EMC shall inform the market participant of the EMC’s initial assessment of the disagreement and provide the market participant an opportunity to respond. If, in respect of the preliminary settlement statement to which the notice of disagreement relates, the EMC’s final determination is that:

5.5.6.1 no error has occurred, the EMC shall so notify the market participant and take no further action; or

5.5.6.2 an error has occurred, the EMC shall so notify the market participant and make the appropriate correction or adjustment:

a. to the corresponding final settlement statement, if that final settlement statement has not yet been issued; or

b. in the next available preliminary settlement statement, if the corresponding final settlement statement has already been issued without reference to the notice of disagreement.

5.5.7 Any changes required to be made in the final settlement amounts as a result of the validation process described in this section 5.5 shall, subject to section 5.14.3, be included as a debit or credit in the final settlement statement issued for each affected market participant on the date on which the final settlement statement that reflects an adjustment made pursuant to section 5.5.6 is issued.
5.5.8 No market participant may submit a notice of disagreement, and the EMC shall not investigate the subject-matter of a notice of disagreement, unless the notice of disagreement is submitted to the EMC within the time specified in section 5.2.2.

5.5.9 No market participant may submit a notice of disagreement in respect of the calculation of:

5.5.9.1 the market energy price applicable to any market participant for any settlement interval;

5.5.9.2 the market reserve price applicable to any reserve provider group of any market participant for any settlement interval; or

5.5.9.3 the market regulation price applicable to any market participant for any settlement interval,

and the EMC shall not investigate the subject-matter of a notice of disagreement to the extent that it relates to any of the elements noted in sections 5.5.9.1 to 5.5.9.3.

5.5.10 Nothing in section 5.5.9 shall prevent a market participant from submitting, or the EMC from investigating, a notice of disagreement that relates to the manner in which any of the elements noted in sections 5.5.9.1 to 5.5.9.3 have been applied for purposes of the calculation of the market participant’s net settlement amount.

5.6 **Final Settlement Statement Coverage**

5.6.1 In accordance with the timelines set forth in section 5.2.3, the EMC shall issue final settlement statements to each market participant to cover transactions in the real-time markets.

5.6.2 The final settlement statement shall be in the same form as the preliminary settlement statement and shall include all of the information provided in the preliminary settlement statement, except as amended following the validation procedure set forth in section 5.5, and/or as adjusted based on any corrected metering data received by the EMC pursuant to Appendix 7B, where applicable.

5.6.3 In accordance with the provisions of sections 5.5.6 and 5.5.7, final settlement statements shall include any required adjustments as a credit or debit to each affected market participant resulting from settlement disagreements that have been resolved prior to the date of issuance of the final settlement statements.
5.6.4 Each market participant that receives a final settlement statement is required to pay any net debit on the corresponding market participant payment date and shall be entitled to receive any net credit shown in the final settlement statement on the corresponding EMC payment date, whether or not there is any outstanding disagreement regarding the amount of the debit or credit.

5.6.5 If a market participant disagrees with an item or calculation set forth on a final settlement statement, other than in respect of the calculation of the element referred to in sections 5.5.9.1 to 5.5.9.3, the provisions of section 5.6.6 shall apply. No market participant may refer to the dispute resolution counsellor under section 5.6.6 a dispute that relates to the calculation of the elements referred to in sections 5.5.9.1 to 5.5.9.3, provided that nothing in this section 5.6.5 shall prevent a market participant from referring to the dispute resolution counsellor a dispute that relates to the manner in which any such elements have been applied for the purposes of the calculation of the market participant’s net settlement amount.

5.6.6 If a market participant, after having made reasonable efforts to resolve with the EMC any disagreement pertaining to a final settlement statement, wishes to continue to dispute the matter it shall, subject to section 5.6.7, refer the matter to the dispute resolution counsellor pursuant to section 3.9.2 of Chapter 3 and shall indicate, in the notice of arbitration submitted to the dispute resolution counsellor for such purpose, the contested amount.

5.6.7 No market participant may submit, and the dispute resolution counsellor shall not accept or take any action with respect to, a notice filed pursuant to section 5.6.6 if:

5.6.7.1 where the dispute relates to the accuracy of metering data, more than forty business days has elapsed since the date on which the final settlement statement to which the notice of arbitration relates was issued; or

5.6.7.2 in all other cases, more than twenty business days has elapsed since the date on which the final settlement statement to which the notice of arbitration relates was issued.

5.6.8 The dispute resolution counsellor shall dismiss a notice filed pursuant to section 5.6.6 and shall not take any further action with respect to the notice if the element of the final settlement statement that is the subject-matter of the notice is one referred to it in violation of section 5.6.5 or is identical to the same element in the corresponding preliminary settlement statement unless the market participant demonstrates that it could not,
with the exercise of due diligence, have filed a notice of disagreement in respect of that preliminary settlement statement.

### 5.7 Final Settlement Statement Recalculations

5.7.1 The EMC shall not recalculate final settlement statements. Except where section 5.8.6 applies,

5.7.1.1 any adjustments required to reflect the resolution of a dispute commenced pursuant to section 5.6.6 shall appear as a separate line item in the applicable preliminary settlement statements issued on the business day immediately following the date of resolution of the dispute; and

5.7.1.2 any adjustments to be made pursuant to Appendix 7B in respect of a trading day for which a final settlement statement has already been issued shall appear as a separate line item in the applicable preliminary settlement statements in accordance with Appendix 7B.

### 5.8 Settlement Invoices

5.8.1 Each invoice issued by the EMC to a market participant shall be based on any final settlement statements that have not otherwise been invoiced at that time. In each invoice:

5.8.1.1 each line item shall correspond to a distinct commodity or service for transactions effected on the trading days to which the invoice relates; and

5.8.1.2 the settlement ID appearing on the invoice shall allow invoice line items to be cross-referenced to the relevant final settlement statements.

5.8.2 Each invoice issued by the EMC to a market participant shall show:

5.8.2.1 the dollar amounts which are to be paid by or to the market participant, according to the settlement statements as specified in section 5.8.1;

5.8.2.2 the market participant payment date by which such dollar amounts, if any, are to be paid by the market participant no later than the close of banking business;

5.8.2.3 the EMC payment date by which the EMC is to make payments, if any, to the market participant no later than the close of banking business; and
5.8.3 *Invoices* shall be considered issued to *market participants* when released by the *EMC* in accordance with the applicable *market manual*.

5.8.4 It is the responsibility of each *market participant* to notify the *EMC* if it fails to receive, or it is unable to access and obtain, an *invoice* on a given *business day* in the manner specified in the applicable *market manual*. Each *market participant* shall be deemed to have received its *invoice* on the *business day* on which the *invoice* has been made available in accordance with section 5.8.3, unless it notifies the *EMC* to the contrary in accordance with the applicable *market manual*.

5.8.5 In the event that a *market participant* notifies the *EMC* that it has failed to receive, or it is unable to access and obtain, an *invoice* in accordance with the applicable *market manual*, the *EMC* shall re-release or make available the applicable *invoice* and the *invoice* shall be considered issued and received on the date such *invoice* is re-released or made available to the *market participant* by the *EMC*.

5.8.6 Notwithstanding any provision in the *market rules*, the *EMC* may issue an *invoice* to:

5.8.6.1 any person whose registration as a *market participant* has expired pursuant to section 4.1.4 of Chapter 2; or

5.8.6.2 any person who is a *terminated market participant*,

in respect of all adjustment amounts payable by or to such person pursuant to these *market rules* and the *EMC* shall not be required to issue a *preliminary settlement statement* or a *final settlement statement* in respect of any such adjustment amounts. For each such invoice, the *EMC* shall calculate a net *invoice* amount, being the aggregate of all amounts stated therein as payable by or to such person. Such net *invoice* amount shall be a positive or negative dollar amount for that person and:

a. where such net *invoice* amount is negative, the absolute value of the net *invoice* amount shall be an amount payable by that person to the *EMC*; or

b. where such net *invoice* amount is positive, the absolute value of the net *invoice* amount shall be an amount receivable by that person from the *EMC*.

### 5.9 Payment of Invoices

5.9.1 Subject to section 5.9.2, each *market participant* shall pay the full net *invoice* amount by the *close of banking business* on the *market participant payment date* shown on that *invoice* regardless of whether or not the
A market participant has initiated or continues to have a dispute respecting the net invoice amount payable.

5.9.1A For the avoidance of doubt, a market participant’s payment liability under the market rules shall be deemed to have been incurred by the market participant at the time of the relevant act, omission or event in respect of which such payment liability accrues to the market participant under the market rules, subject only to the determination, at a later date in accordance with the market rules, of the quantum to be paid by that market participant therefor.

5.9.2 A market participant may pay at an earlier date than the market participant payment date in accordance with the following:

5.9.2.1 notification must be given to the EMC before submitting such prepayment or before converting an existing overpayment by the market participant into a prepayment;

5.9.2.2 the prepayment notification shall specify the dollar amount prepaid;

5.9.2.3 a prepayment shall be made by the market participant into the EMC settlement clearing account;

5.9.2.4 the EMC shall keep a separate ledger balance of the aggregate of such prepayments at any point in time; and,

5.9.2.5 subject to section 7.5.3 of Chapter 2, funds under such a ledger balance may be applied by the EMC to any outstanding financial obligations of that market participant to the EMC for transactions carried out in the wholesale electricity markets.

5.9.3 With respect to the recovery of the EMC’s administrative costs referred to in section 4.2.1, the EMC may instruct the bank where the EMC settlement clearing account is held to debit the EMC settlement clearing account and transfer to the relevant EMC operating account sufficient funds to pay in full the amount of such costs falling due on any EMC payment date in priority to any other payments to be made on that EMC payment date or on subsequent days out of the EMC settlement clearing account.

5.9.4 The EMC shall, by any EMC payment date, determine the amounts available in the EMC settlement clearing account for distribution to market participants and make payment accordingly no later than the close of banking business on the EMC payment date.

5.9.5 A person who is issued an invoice under section 5.8.6 shall, notwithstanding the expiration or termination of such person’s
registration as a market participant, pay to the EMC the net invoice amount payable by that person under such invoice within 20 business days of the date of such invoice. Where the net invoice amount under the invoice issued under section 5.8.6 is payable by the EMC to such person, the EMC shall pay to that person the net invoice amount within 20 business days of the date of such invoice.

5.10 Funds Transfer

5.10.1 All payments by market participants in respect of settlement matters shall be made to the applicable EMC bank account via electronic funds transfer and shall be effected by the dates and times specified in this Chapter.

5.10.2 All payments by the EMC to market participants in respect of settlement matters shall be made to each market participant’s market participant bank account via electronic funds transfer and shall be effected by the dates and times specified in this Chapter.

5.10.3 In the event of failure of any electronic funds transfer system affecting the ability of either a market participant or the EMC to make payments, the affected party shall arrange for alternative means of payment so as to ensure that payment is effected by the dates and times specified in this Chapter.

5.10.4 Each electronic funds transfer shall only comprise amounts attributable to one invoice or prepayment, unless such electronic funds transfer is in such form as may be specified in the applicable market manual.

5.11 Confirmation Notices

5.11.1 At the end of each month, the EMC shall issue a monthly confirmation notice to each market participant which shall contain statements of the amounts received from or paid out to the market participant on each market participant payment date and EMC payment date in that month and any payments outstanding.

5.12 Payment Default

5.12.1 The EMC shall ascertain if the full amount due by any market participant has been remitted to the EMC settlement clearing account by the end of the business day following the market participant payment date.

5.12.2 A market participant shall notify the EMC immediately if it becomes aware that a payment for which it is responsible will not be remitted to the EMC settlement clearing account on time and shall provide the reason for the delay in payment.
5.12.3 If the full amount due by a market participant has not been remitted after accounting for any prepayments made by the market participant pursuant to section 5.9.2, the provisions of section 7.3 of Chapter 3 shall apply and default interest shall accrue on all amounts outstanding.

5.12.4 The EMC shall be authorised to borrow short-term funds to clear the credits in any settlement cycle only if the following conditions are met:

5.12.4.1 there are insufficient funds remitted into the EMC settlement clearing account to pay all market creditors due for payment from the funds in the EMC settlement clearing account, and clear the EMC settlement clearing account on a given EMC payment date, due to payment default by one or more market participants in the real-time markets; and

5.12.4.2 after taking the action described in section 5.12.6, the EMC has no funds available to it in other accounts which it is permitted to transfer to the EMC settlement clearing account.

5.12.5 If the EMC borrows short-term funds pursuant to section 5.12.4, it shall recover this borrowing by taking all steps against the defaulting market participant as provided for in these market rules and as referred to in section 9.1.2.2 of Chapter 2 and then, if necessary, by imposing the default levy in accordance with section 9 of Chapter 2.

5.12.6 If there are insufficient funds remitted into the EMC settlement clearing account to pay all market creditors due for payment from the funds in the EMC settlement clearing account, and clear the EMC settlement clearing account on a given EMC payment date due to default by one or more market participants in the real-time markets the EMC shall transfer funds from the EMC settlement reserve account to the EMC settlement clearing account to clear it no later than the close of banking business on that EMC payment date.

5.12.7 If there is still insufficient funds to pay all market creditors after the application of rule 5.12.6 in relation to amounts payable by the EMC on a particular EMC payment date, then EMC shall pro-rata all payments due to market creditors calculated in accordance with the following formula:

\[
(TIF_{sd} / TOF_{sd}) \times AO_{mp, sd}
\]

Where:

\( TIF_{sd} \) = Total amount actually received for a settlement date

\( TOF_{sd} \) = Total amount owed to market creditors for a settlement date

\( AO_{mp, sd} \) = Amount owed to a market creditor for a settlement date
5.13 Payment Errors, Adjustments, and Interest

5.13.1 If a market participant receives an overpayment on any EMC payment date:

5.13.1.1 the market participant shall notify the EMC of such overpayment within two business days of the overpayment or immediately as soon as the market participant thereafter becomes aware of the situation;

5.13.1.2 if the EMC determines or becomes aware of the overpayment prior to being notified by the market participant, the EMC shall notify the market participant of the overpayment;

5.13.1.3 the market participant receiving the overpayment shall, until it has repaid the overpayment to the EMC, be deemed to be holding the amount of such overpayment in trust for any other market participants that may have been underpaid in consequence of such overpayment, pro rata to the amount of the underpayment;

5.13.1.4 if not repaid fully within two business days of receiving the overpayment, the EMC shall be entitled to treat the overpayment and any interest accruing thereon as an unpaid amount to which section 5.12 applies; and

5.13.1.5 if not repaid fully within two business days of receiving the overpayment, the unpaid amount of any overpayment shall bear interest at the default interest rate from the date of overpayment until the date on which repayment is credited to the EMC’s relevant bank account.

5.13.2 The EMC shall be responsible for identifying any market participants who have been underpaid as a result of an overpayment to another market participant.

5.13.3 The EMC shall pay any underpaid market participant for the amounts of their underpayment, including interest calculated from the date the market participant should have been paid, as soon as practicable following repayment by the overpaid market participant.

5.13.4 If a market participant has overpaid the EMC on any market participant payment date:

5.13.4.1 the market participant shall notify the EMC of such overpayment within two business days or immediately as soon as the market participant thereafter becomes aware of the situation;
5.13.4.2 if the EMC determines or becomes aware of such overpayment prior to being notified by the market participant, the EMC shall notify the market participant accordingly;

5.13.4.3 the market participant may request that the overpaid amount be either refunded or treated as a prepayment in accordance with section 5.9.2; and

5.13.4.4 any related administration and transaction costs incurred by the EMC in managing and resolving the overpayment shall be charged to the account of the market participant involved.

5.13.5 If the EMC underpays any market participant on any EMC payment date:

5.13.5.1 the market participant shall notify the EMC of such underpayment within two business days or immediately as soon as the market participant thereafter becomes aware of the situation;

5.13.5.2 if the EMC determines or becomes aware of the underpayment prior to being notified by the market participant, the EMC shall notify the market participant accordingly; and

5.13.5.3 the EMC shall use all reasonable endeavours to promptly correct any underpayments, including interest thereon at the default interest rate.

5.13.6 If the EMC is underpaid by a market participant on any market participant payment date, the provisions of section 5.12 shall apply.

5.13.7 If the EMC debits the EMC settlement reserve account on an EMC payment date because a payment due from a market participant was received too late to be credited to the EMC settlement clearing account by the close of banking business on the market participant payment date when such payment was due, then such remittance when it does arrive shall be credited to the EMC settlement reserve account to replenish the debited amount. Any such late payments shall be charged interest at the default interest rate.

5.13.8 If the EMC holds or has under its control after five business days from receipt in the EMC settlement clearing account amounts which it ought properly to have paid to market participants, such market participants shall be entitled to interest on such amounts at the default interest rate from the date on which the EMC commenced to improperly hold or have such amounts under its control to the date on which such amounts are paid to the relevant market participants.
5.13.9 Monies in the *EMC bank accounts* at the end of each year which have been earned from interest on funds in the *EMC bank accounts* and which are not attributable to any incomplete settlement process or outstanding settlement dispute shall be used to off-set the EMC’s administrative costs referred to in section 4.2.1 in the following year.

5.14 **Settlement Financial Balance/Maximum Amount Payable by EMC**

5.14.1 The *EMC* shall provide and operate a settlement control process to monitor the financial balance of the calculated charges and payments so as to ensure that, subject to section 5.14.3:

5.14.1.1 for *settlement interval* transactions the sum of all payments for all *market creditors* involved in such *settlement interval* transactions exactly equal the sum of all charges for *market debtors* involved in such *settlement interval* transactions for each *trading day*; and

5.14.1.2 for all non-*settlement interval* transactions, the sum of all payments to *market creditors* of those transactions exactly equals the sum of all charges to *market debtors* of those transactions.

5.14.2 Subject to the provisions of section 5.12, the *EMC* shall not be liable to make payments in excess of the amount it receives for transactions in the *real-time markets*.

5.14.3 If there is an aggregate imbalance for all transactions for a given *trading day* the *EMC* shall, in accordance with section 5.14.4 or by such other means as the *EMC* determines appropriate, recover that portion of the imbalance that arises by virtue of the rounding of *settlement amounts* or of an adjustment to the *settlement statement* of one *market participant* that is too small to be reflected in corresponding *settlement statements* of other *market participants* provided that:

5.14.3.1 the manner of calculation of that portion of the imbalance can be evidenced in a manner satisfactory for purposes of the audit referred to in section 5.15; and

5.14.3.2 that portion of the imbalance has accumulated to an amount which is sufficient to permit recovery.

5.14.4 The *EMC* may recover the portion of an aggregate imbalance referred to in section 5.14.3 by means of an adjustment to a *settlement statement* applied:
5.14.4.1 to each market participant to whom energy uplift charges may be allocated pursuant to these market rules;

5.14.4.2 in the same manner as energy uplift charges; and

5.14.4.3 in respect of all settlement intervals of the trading day in which the portion of such aggregate imbalance is determined to arise and be recoverable pursuant to section 5.14.3.

5.15 Audit

5.15.1 The audit of settlement functions referred to in this section 5.15 shall serve to examine and evaluate compliance with management control objectives and operational effectiveness of settlement processes and procedures.

5.15.2 The audits referred to in section 5.15.3 shall be performed by an external, independent auditing firm at least annually and more often if requested by the EMC Board.

5.15.3 Notwithstanding the market commencement date, the EMC shall direct a comprehensive external audit of the settlement processes and procedures with respect to the period commencing on the market commencement date and ending on the financial year end of the EMC. Subsequent external audits for similar purposes shall be conducted with respect to the period of time that coincides with the EMC’s financial year. All external audits shall include the following tasks:

5.15.3.1 gauge the performance of the settlement process in meeting the objectives of these market rules;

5.15.3.2 review the accuracy and timeliness of the production of settlement statements, including settlement calculations and financial allocations;

5.15.3.3 review the accuracy and timeliness of the production of invoices and supporting market and system information;

5.15.3.4 review the reliability and integrity of the market and system operational data used in the settlement processes and procedures;

5.15.3.5 review the reliability and security of the information technology system infrastructure used to measure, validate, classify, compute and report settlement information;

5.15.3.6 review the adequacy of settlement processes and procedures to safeguard confidential information relating to settlement processes; and
5.15.3.7 review the adequacy and effectiveness of risk management controls of the settlement processes and tools.

5.15.4 Settlement statements, financial settlement records and any documentation pertaining to the EMC’s settlement activities shall be kept in secure storage for a period of at least six years and made available for auditing purposes.

5.15.5 An audit report shall be prepared by the auditors in respect of each audit conducted pursuant to this section 5.15 and shall be commissioned on the basis that the audit report must be provided to the EMC within one month after completion of the audit activities.

5.15.6 Each audit report prepared pursuant to this section 5.15 shall be provided to all market participants, the PSO and the Authority, subject to such measures as may be required to be taken to safeguard any confidential information contained in such audit report.

5.16 BANK ACCOUNTS

5.16.1 The EMC shall establish and maintain the bank accounts described in this section 5.16 for the operation of its settlement and invoicing processes and for such other purposes as may be prescribed or contemplated under the market rules or any market manual.

5.16.2 The EMC shall maintain its bank accounts at a single bank or financial institution in Singapore approved by the EMC Board. The EMC shall publish the name of such bank or financial institution.

5.16.3 The EMC may change the bank or financial institution or the details of any of its bank accounts, on the condition that the bank or financial institution is reasonably acceptable to the EMC Board and that all market participants are notified by the EMC in writing at least 60 business days before the change takes effect.

5.16.4 The EMC shall obtain lines of credit and other banking facilities it deems necessary for the operation of the bank accounts described in this section 5.16, which lines of credit and other banking facilities shall not exceed an aggregate amount approved by the EMC Board.

5.16.5 In addition to those bank accounts referred to in this section 5.16 as may be necessary to implement the settlement and invoicing processes outlined in this Chapter, the EMC may establish bank accounts at its bank or financial institution described in section 5.16.2. Market participants shall be notified 60 business days prior to any such additional bank accounts becoming operational.
5.16.6 The EMC shall open and maintain the EMC settlement clearing account as a single bank account to and from which all settlement payments shall be made in accordance with the provisions of this Chapter.

5.16.7 The EMC shall open and maintain the EMC settlement reserve account, which bank account shall operate as follows:

5.16.7.1 the EMC settlement reserve account shall be a single bank account established to provide, in the event of default in payment by a market participant, the transfer of necessary funds from this bank account to clear the EMC settlement clearing account; and

5.16.7.2 when required, funds shall be transferred to the EMC settlement clearing account to cover or reduce any deficits in accordance with the provisions of section 5.12.6.

5.16.8 The EMC shall open and maintain the EMC adjustment account, which bank account shall operate as follows:

5.16.8.1 the EMC adjustment account shall be a single bank account established to receive and disburse payments related to financial penalties, damages, fines and payment adjustments arising from resolved settlement disputes, and to reimburse the EMC for any associated costs or expenses;

5.16.8.2 any amounts paid into the EMC adjustment account by market participants shall first be applied to reimburse the EMC in respect of any costs or expenses described in section 5.16.8.1 which it has or will incur. Any remaining amount shall be credited to the EMC adjustment account; and

5.16.8.3 if the credit balance of the EMC adjustment account exceeds an amount specified by the EMC Board, such excess shall be used to reduce the EMC’s administrative costs referred to in section 4.2.1 in the following year.

5.16.9 Unless otherwise specified, the EMC shall recover all banking costs reasonably incurred in opening and operating the EMC’s bank accounts as part of the recovery of the EMC’s administrative costs referred to in section 4.2.1.

5.16.10 Each market participant shall be required to open and maintain a market participant bank account at the bank or financial institution at which the EMC maintains its bank accounts at any given time.
Explanatory Note – The previous clause allows the continuation of the existing arrangement whereby all market participants maintain their bank accounts at a single bank. However, the EMC has the choice of which bank to use, and market participants are required to follow suit.

5.16.11 Each market participant shall inform the EMC of all applicable information required for the EMC to make payment to or from the market participant’s market participant bank account.

5.16.12 Subject to section 5.16.10, any market participant may change details of its bank account, on the condition that the EMC is notified in writing at least 20 business days before the change takes effect.

5.17 APPLICATION TO MSSL

5.17.1 The provisions of sections 5.1 to 5.16 shall apply to a market support services licensee that, on its own behalf or on behalf of any person in respect of which it provides market support services pertaining to the wholesale electricity markets, is or may be entitled to receive a settlement amount from, or required to pay a settlement amount to, the EMC and, for this purpose, all references in those sections to a market participant shall be deemed to include a reference to a market support services licensee.

5.17A APPLICABILITY TO MARKET PARTICIPANTS OF NON-EXPORTING EMBEDDED INTERMITTENT GENERATION FACILITIES

5.17A.1 The provisions of sections 5.1 to 5.16 shall not apply to a market participant that is registered as a market participant for the sole purpose of registering one or more generation facilities as one or more non-exporting embedded intermittent generation facilities. All references in those sections to a market participant shall be deemed to exclude a reference to a market participant that is registered as a market participant for the sole purpose of registering one or more generation facilities as one or more non-exporting embedded intermittent generation facilities.

5.18 AGGREGATE INTERTIE AMOUNTS

5.18.1 The EMC shall, determine intertie energy quantities for the settlement interval corresponding to each dispatch period, as follows:

\[ \text{IMQ}_{h} = \text{Aggregate intertie import quantities (in MWh)} \]

flowing into the transmission system due to intertie flows at MNN i in settlement interval h
5.18.2 The EMC shall determine aggregate intertie amounts for the settlement interval corresponding to each dispatch period using the quantities determined in section 5.18.1 and applicable energy prices, as follows:

\[
IXQ_{ih}^i = \text{Aggregate intertie export quantities (in MWh) flowing out of the transmission system due to intertie flows at MNN } i \text{ in settlement interval } h
\]

\[
IMA_h = \sum_i MEP_{ih}^i \times IXQ_{ih}^i
\]

where:

- \( h \) = a settlement interval
- \( \Sigma_i \) = sum over all MNNs i associated with interties

\[
IXA_h = \sum_i USEP_{ih} \times IXQ_{ih}^i
\]

where:

- \( h \) = a settlement interval
- \( \Sigma_i \) = sum over all MNNs i associated with interties

5.18.3 The EMC shall on a monthly basis produce and submit a report containing the values in sections 5.18.1 and 5.18.2 to the Authority.