

Singapore Electricity Market Rules

Chapter 7 Settlement

Energy Market Authority

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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*:

MEP_h^m = *market energy price* (in \$/MWh) at *MNN m* for *settlement interval h*

$USEP_h$ = *uniform Singapore energy price* (in \$/MWh) at the *SHUB* for *settlement interval h*

$MRP_{r,h}$ = *market reserve price* (in \$/MWh) for *reserve* from *reserve provider group r* for *settlement interval h*

$GRQ_{r,h}^m$ = *generation registered facility reserve quantity* (in MWh) of *reserve* from *reserve provider group r* for *GRF m* for *settlement interval h*

$IEQ_h^{m(a)}$ = *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*.

$LRQ_{r,h}^a$ = load registered facility reserve quantity (in MWh) of reserve from reserve provider group r for all LRFs associated with settlement account a for settlement interval h

MFP_h = market regulation price (in \$/MWh) for settlement interval h

GFQ_h^m = generation registered facility regulation quantity (in MWh) for GRF m for settlement interval h

LCP_h = load curtailment price (in \$/MWh) for settlement interval h

$LCQ_h^{p(a)}$ = 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.

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:

$IEQ_h^{m(a)}$ = injection energy quantity (in MWh) for GRF $m(a)$ or GSF $m(a)$ associated with settlement account a for settlement interval h

WEQ_h^a = withdrawal energy quantity (in MWh), deemed to be withdrawn at the SHUB by all load associated with settlement account a for settlement interval h

- WFQ_h^a = 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_h^a = 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*;
- $WPQ_{h(sa)}$ = 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_h^i = 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_h^a = 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*
- $WLQ_h^{p(a)}$ = 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*:

$$\text{RRS}_h^m = \text{share of total reserve costs to be paid by GRF } m \text{ or IRF } m, \text{ as determined in accordance with Appendix 7A.}$$

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:

$BAQ_h^{s,b}$ = 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* to the *buying market participant* and credited to the *buying market participant's settlement account b* at the *SHUB* for *settlement interval h*, with $BAQ_h^{s,b} \geq 0$

$BWF_h^{s,b}$ = bilateral withdrawal fraction indicating the fraction of the total withdrawal *energy quantity* in the *buying market participant's settlement account b* (WEQ_h^b) that is to be credited to that *settlement account b* and debited from the *selling market participant's settlement account s* at the *SHUB* for *settlement interval h*, with $BWF_h^{s,b} \geq 0$

$BIF_h^{s,b}$ = bilateral injection fraction indicating the fraction of the total injection *energy quantity* in the *selling market participant's settlement account s* (IEQ_h^s) that is to be credited to the *buying market participant's settlement account b* at the *SHUB* for *settlement interval h*, 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:

$$\text{BEQ}_h^{s,b} = \text{BAQ}_h^{s,b} + \text{BWF}_h^{s,b} \times \text{WEQ}_h^b + \text{BIF}_h^{s,b} \times \text{IEQ}_h^s$$

- 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:

$$\text{BFQ}_h^{s,b} = \text{bilateral } \textit{regulation} \text{ quantity (in MWh) of } \textit{regulation} \text{ being sold by the } \textit{selling market participant} \text{ and debited from the } \textit{selling market participant's settlement account s} \text{ to the } \textit{buying market participant} \text{ and credited to the } \textit{buying market participant's settlement account b} \text{ in } \textit{settlement interval h}$$

- 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:

$$\text{BRQ}_{r,h}^{s,b} = \text{bilateral } \textit{reserve} \text{ quantity (in MWh) of } \textit{reserve} \text{ from } \textit{reserve provider group r} \text{ being sold by the } \textit{selling market participant} \text{ and debited from the } \textit{selling market participant's settlement account s} \text{ to the } \textit{buying market participant} \text{ and credited to the } \textit{buying market participant's settlement account b} \text{ in } \textit{settlement interval h}$$

- 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*:

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

- 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 the holders of vesting contracts and that no assignment of these contracts will be permitted by the MSSL. This MSSL will be a party to vesting contracts that are intended to hedge non-contestable consumers against “uncontrollable” variations in the USEP. The total vesting contract quantity for each holder of vesting contracts may comprise one or more of the following vesting quantity or vesting quantities:

- (i) base vesting quantity, being the vesting quantity determined by the Authority and subsequently allocated by the MSSL under a vesting contract; and

(ii) tender vesting quantity, being the vesting quantity determined by the Authority and subsequently allocated by the MSSL under a vesting contract pursuant to the Authority's Tender Vesting Scheme.

(iii) residual vesting quantity, being the vesting quantity calculated by the EMC pursuant to the Authority's Residual Vesting Scheme.

“Base Vesting Scheme” ,“Tender Vesting Scheme” and “Residual Vesting Scheme” refer to the agreements and arrangements referred to in the Authority's paper on the “Procedures for Calculating the Components of the Vesting Contracts for 1 July 2023 to 30 June 2028” on EMA's website.

The MSSL will provide the EMC an electronic file containing vesting quantity and vesting price information for each settlement interval and for the settlement account of each holder of base vesting contract and/or tender vesting contract, for each vesting period (i.e. a calendar quarter).

Each holder of base vesting contract and/or tender vesting contract is required to participate in the Residual Vesting Scheme. Under the Residual Vesting Scheme, the holder will use up to its excess generation output (if any) that is uncontracted and generated using its own term gas supply (“Uncontracted Excess Generation Quantity”) to hedge any residual non-contestable consumers load. Such vesting quantity for hedging residual non-contestable consumers load is referred to as residual vesting quantity and will be allocated ex-post to all holders in proportion to their respective Uncontracted Excess Generation Quantity on a half-hourly basis.

For each month, the Authority will provide the EMC an electronic file containing the Uncontracted Excess Generation Quantity and the residual vesting price for each holder of a vesting contract for each settlement interval in that month.

The EMC will determine the residual vesting quantity and will allocate the price for each residual tranche, for each holder of a residual vesting contract and each settlement interval on an ex-post basis.

A holder of 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 holder 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 quarterly tariff to apply to the non-contestable consumers in each quarter will include the expected cost of the base vesting and the tender vesting contracts of the prevailing quarter, the residual vesting contracts payments allocated to the holders of vesting contracts in the previous quarters, and an adjustment to account for the shortfall or surplus in the previous quarters

between the amount paid by non-contestable consumers and the amount paid to the holders of vesting contracts.

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 a holder of 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:

BVQ_h^a = base vesting quantity (in MWh) allocated for *settlement interval h* for *settlement account a*

BVP_h^a = base vesting price (in \$/MWh) associated with a given base vesting quantity allocated for *settlement interval h* for *settlement account a*

$TVQ_{h,b}^a$ = tender vesting quantity (in MWh) allocated for *settlement interval h* for *settlement account a*, for tender tranche *b*

$TVP_{h,b}^a$ = tender vesting price (in \$/MWh) associated with a given tender vesting quantity allocated for *settlement interval h* for *settlement account a*, for tender tranche *b*

where “tender tranche” means a tranche in a tender called by the *Authority* pursuant to the Tender Vesting Scheme 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*.

2.5.3A The *MSSL counterparty* shall, no later than 5:00 p.m. of the fifth *business day* following the end of the day that is 75 calendar days after a *trading day*, provide the *EMC* with an electronic data file containing the following information required for the settlement of residual vesting contract associated with that *trading day*.

$MDQ_{r(h)}$ = Maximum Daily Contracted Quantity for *settlement interval* $r(h)$ of that *trading day*

$NCC\ load_{r(h)}$ = Actualised Non-contestable Consumers (NCC) load for *settlement interval* $r(h)$ of that *trading day*

where:

$r(h)$ = *settlement interval* h of the *trading day* that the residual vesting contract is for

2.5.4 Following receipt of the *vesting contract* data referred to in section 2.5.3 and 2.5.3A, 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*.

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, 2.5.3A or this section 2.5.5. Section 2.5.4 shall apply, *mutatis mutandis*, to any such revised *vesting contract* data.

2.5.6 For each calendar, the *Authority* shall, for each *settlement account* associated with a *market participant* that is a holder of a *vesting contract*, determine the following information required for the settlement of residual vesting contract, for each *settlement interval* in that month.

$UEGQ_{r(h)}^a$ = Uncontracted Excess Generation Quantity (in MWh) for *settlement interval* $r(h)$ associated with *settlement account* a

$RVP_{r(h),1}^a$ = residual vesting price (in \$/MWh) for *settlement interval* $r(h)$ associated with first tranche of residual vesting quantity of *settlement account* a

$RVP_{r(h),2}^a$ = residual vesting price (in \$/MWh) for *settlement interval* $r(h)$ associated with second tranche of residual vesting quantity of *settlement account* a

where:

$r(h)$ = *settlement interval* h of the *trading day* that the residual vesting contract is for

2.5.7 The *authority* shall, by no later than 5:00 p.m. in the first *business day* after the 10th calendar day of the second month following the end of the last *trading day* of a calendar month, provide the *EMC* with an electronic data file containing the information required for the *settlement* of residual vesting contract (as referred to in section 2.5.6 above) of that calendar month.

2.5.8 The *EMC* shall determine for each *settlement account* associated with a *market participant* that is a holder of a *vesting contract*, each residual vesting quantity (associated with its residual vesting price) for that *settlement account* for each *settlement interval* in the *vesting period*.

Explanatory Note: The residual vesting quantity of a holder of a vesting contract shall be determined based on the residual non-contestable consumers load, in proportion to the holder's uncontracted excess generation quantity, and shall be capped at its uncontracted excess generation quantity.

2.5.8.1 The share of residual vesting quantity (RVQ) allocated to a *market participant* that is a holder of a vesting contract shall be determined as follows:

$$RVQ_{r(h)}^a = \text{Min}\{\text{Max}(\text{Unhedged NCC load}_{r(h)} \times \frac{UEGQ_{r(h)}^a}{\sum_a UEGQ_{r(h)}^a}, 0), UEGQ_{r(h)}^a\}$$

where:

$r(h)$ = *settlement interval* h of the *trading day* that the residual vesting contract is for

a = a *settlement account* which is associated with a *market participant* that is a holder of a *vesting contract*

$$\begin{aligned} \text{Unhedged NCC load}_{r(h)} &= \text{NCC load}_{r(h)} - \\ &[\sum_a (\text{BVQ}_{r(h)}^a \\ &+ \sum_{b=1}^n \text{TVQ}_{r(h),b}^a)] \end{aligned}$$

b = a tender tranche as defined in section 2.5.2

\sum_a = sum over all *settlement accounts a*

2.5.8.2 Out of the total residual vesting quantity allocated to a *market participant* that is a holder of a *vesting contract*, the first tranche of residual vesting quantity shall be determined as follows:

$$\begin{aligned} \text{RVQ}_{r(h),1}^a &= \text{Min}\{\text{RVQ}_{r(h)}^a, \text{Max}[\text{Min}(\text{UEGQ}_{r(h)}^a, \\ &\text{Capped Unhedged NCC load}_{r(h)} \\ &\times \frac{\sum \text{BVQ}_{r(h)}^a + \sum \text{TVQ}_{r(h),\text{VC-GS}}^a}{\sum_a (\sum \text{BVQ}_{r(h)}^a + \sum \text{TVQ}_{r(h),\text{VC-GS}}^a)}, 0]\} \end{aligned}$$

where:

r(h) = *settlement interval h* of the *trading day* that the residual vesting contract is for

a = a *settlement account* which is associated with a *market participant* that is a holder of a *vesting contract*

\sum_a = sum over all *settlement accounts a*

$$\begin{aligned} \text{Capped Unhedged NCC load}_{r(h)} &= \text{Min}\{\text{Unhedged NCC load}_{r(h)}, [\text{MDQ} - \\ &\sum_a (\text{BVQ}_{r(h)}^a + \sum_{b=1}^n \text{TVQ}_{r(h),b}^a)]\} \end{aligned}$$

$\text{TVQ}_{r(h),\text{VC-GS}}^a$ = the tender tranche(s) associated with *settlement account a*, which represents the tender vesting quantities allocated for *settlement interval r(h)* that involve the use of gas from the *Authority's* appointed gas supplier under the *vesting contract* pursuant to the Residual Vesting Scheme for the supply of *energy* for non-contestable *load*.

- 2.5.8.3 Out of the total residual vesting quantity allocated to a market participant, the second tranche of residual vesting quantity (RVQ) shall be determined as follows:

$$RVQ_{r(h),2}^a = \text{Max}[(RVQ_{r(h)}^a - RVQ_{r(h),1}^a), 0]$$

where:

$r(h)$ = *settlement interval h of the trading day that the residual vesting contract is for*

a = *a settlement account which is associated with a market participant that is a holder of a vesting contract*

- 2.5.9 The *EMC* shall use the *vesting contract* data referred to in section 2.5.2, 2.5.3A, 2.5.6, 2.5.7, and 2.5.8 to determine *vesting contract settlement* credits in accordance with section 3.6.1.
- 2.5.10 The *settlement statement* issued for a *trading day* shall include the residual vesting contract *settlement amount* for *trading day* that is 75 calendar days before the *trading day*.
- 2.5.11 The *EMC* shall be entitled to and shall rely on any *vesting contract* data submitted by the *MSSL counterparty and the Authority* pursuant to section 2.5.2, 2.5.3, 2.5.3A, 2.5.5, 2.5.6 and 2.5.7 for determining *settlement amounts* in accordance with this Chapter and, notwithstanding section 13 of Chapter 1:
- 2.5.11.1 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*;
- 2.5.11.2 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
- 2.5.11.3 the *Authority* and 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-curtailement 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:

$\text{OIEC}_{p,h}$ = 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

$WLQ_{p,h}$ = 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

$LCQ_{p,h}$ = *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:

$$\text{GESCh}^a = \sum_{m(a)} \text{MEP}_h^{m(a)} \times \text{IEQ}_h^{m(a)}$$

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:

$$\text{LESD}_h^a = \text{USEP}_h \times \text{WEQ}_h^a$$

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:

$$\text{BESC}_h^a = \text{USEP}_h \times \sum_j (\text{BEQ}_h^{j,a} - \text{BEQ}_h^{a,j})$$

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:

$$\text{NESC}_h^a = \text{GES}_h^a - \text{LES}_h^a + \text{BESC}_h^a$$

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 = a *settlement account*

h = 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:

$$AFP_h = \sum_i FSC_h^i / \sum_j FEQ_h^j$$

where:

h = a *settlement interval*

\sum_i = sum over all *settlement accounts* i

\sum_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*:

$$FEQ_h^a = WEQ_h^a + \sum_{m(a)} | \text{MIN} [IEQ_h^{m(a)}, CSZ] |$$

where:

a = a *settlement account* which is not associated with any *pseudo generation settlement facility*

h = a *settlement interval*

$\sum_{m(a)}$ = 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

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:

$$FEQ_h^a = WEQ_h^a + \sum_{n(a)} | IEQ_h^{n(a)} |$$

where:

a = 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 = a *settlement interval*

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

$|X|$ = 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:

$$FEQ_h^a = WFQ_h^a$$

where:

a = 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 = 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:

$$FSD_h^a = AFP_h \times FEQ_h^a$$

where:

a = a *settlement account*

h = 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:

$$FCC_h^a = MFP_h \times \sum_j (BFQ_h^{j,a} - BFQ_h^{a,j})$$

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:

$$RSC_{r,h}^a = MRP_{r,h} \times (\sum_{m(a)} GRQ_{r,h}^{m(a)} + LRQ_{r,h}^a)$$

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:

$RRS_h^{m(a)}$ = *reserve responsibility share* for *GRF* $m(a)$
for *settlement interval* h as determined in
accordance with Appendix 7A

h = a *settlement interval*

$\sum_{m(a)}$ = sum over all *GRFs* $m(a)$ associated with
settlement account a

\sum_r = sum over all *reserve provider groups* r

\sum_j = 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 = a *settlement account*

h = a *settlement interval*

r = a *reserve provider group*

\sum_j = 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 = a *settlement account*

h = a *settlement interval*

\sum_r = 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:

$$LCSC_h^a = LCP_h \times \sum_{p(a)} LCQ_h^{p(a)}$$

where:

a = a *settlement account*

h = a *settlement interval*

$\sum_{p(a)}$ = 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:

$$HLCU_h = \sum_a LCSC_h^a / \sum_a WDQ_h^a$$

where:

a = a *settlement account*

h = a *settlement interval*

Σ_a = sum over all *settlement accounts* a

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:

$$\text{HEUA}_h = \Sigma_a (\text{NESC}_h^a + \text{NRSC}_h^a + \text{NTSC}_h^a + \text{NFSC}_h^a + \text{NMEA}_h^a)$$

where:

a = *settlement account* a

h = a *settlement interval*

Σ_a = sum over all *settlement accounts* a

NMEA_h^a = net *metering error* adjustment for *settlement account* a 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:

$$\text{HEUR}_h = \text{HEUA}_h / \Sigma_a \text{WEQ}_h^a$$

where:

h = a *settlement interval*

Σ_a = sum over all *settlement accounts* a

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 = a *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.

MEUC = 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:

$VCSC_h^a =$	$(BVP_h^a - VCRP_h^a) \times BVQ_h^a +$ $+ \sum_{b=1}^n [(TVP_{h,b}^a - VCRP_h^a) \times TVQ_{h,b}^a] +$ $\sum_{i=1}^2 [(RVP_{r(h),i}^a - VCRP_{r(h)}^a) \times RVQ_{r(h),i}^a]$ <p>for all $a \neq k$</p> <p>where:</p> $VCRP_h^a = \sum_{m(a)} MEP_h^{m(a)} \times \text{MAX}[IEQ_h^{m(a)}, 0] / \sum_{m(a)} \text{MAX}[IEQ_h^{m(a)}, 0]$ <p>= Vesting Contract Reference Price (VCRP) for <i>settlement interval</i> h for <i>settlement account</i> a, and</p> <p>if $\sum_{m(a)} \text{MAX}[IEQ_h^{m(a)}, 0] = 0$, then $VCRP_h^a$ equals to the simple average of its MEPs.</p> $\text{MAX}[IEQ_h^{m(a)}, 0] = \text{maximum of } IEQ_h^{m(a)} \text{ or } 0$ <p>a = a <i>settlement account</i></p> <p>b = a tender tranche as defined in section 2.5.2</p> <p>h = a <i>settlement interval</i></p> <p>$r(h)$ = <i>settlement interval</i> h of the <i>trading day</i> that the residual vesting contract is for</p> <p>i = a tranche of residual vesting quantity as calculated in section 2.5.8.2 and 2.5.8.3</p> <p>k = the settlement account associated with the <i>MSSL counterparty</i></p> <p>$\sum_{m(a)}$ = sum over all <i>GRFs</i> $m(a)$ and <i>GSFs</i> $m(a)$ associated with <i>settlement account</i> a</p>
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Explanatory Note: $VCRP_{h^a}$ is infinite when the sum of $\text{MAX}[\text{IEQ}_{h^m(a)}, 0]$ is zero. In this instance, the $VCRP_{h^a}$ will be the simple average of the settlement account's MEPs.

$$VCSC_h^k = -\sum_{a \neq k} VCSC_h^a$$

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 $VCSC_h^k$ among the relevant parties, the EMC will compute a uniform vesting contract reference price for the MSSL's $VCRP_h^k$ as follows:

$$VCRP_h^k = \frac{\sum_{a \neq k} [(VCRP_h^a)(BVQ_h^a + \sum_{b=1}^n TVQ_{h,b}^a)]}{\sum_{a \neq k} (BVQ_h^a + \sum_{b=1}^n TVQ_{h,b}^a)}$$

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:

$$\text{NASC}_h^a = \text{NESC}_h^a + \text{NFSC}_h^a + \text{NRSC}_h^a + \text{LCSC}_h^a + \text{NTSC}_h^a + \text{VCSC}_h^a - (\text{HEUR}_h \times \text{WEQ}_h^a) - (\text{MEUC} \times \text{WMQ}_h^a) - (\text{HLCU}_h \times \text{WDQ}_h^a)$$

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);
- 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;
- 4.1.1.4F amounts to be paid to *market participants* pursuant to a temporary scheme that has been approved by the *Authority* under Section E.3.3 of Appendix 5E, including financial penalties to be refunded, and any additional payments as approved by the *Authority*; and
- 4.1.1.4G the compensation amount referred to under section 3.11B of Chapter 3;

Explanatory Note: In accordance with “Regulatory Sandbox to Promote Energy Demand Management” published by EMA on 26 October 2022, a temporary scheme will be implemented, in which lower compliance thresholds and penalties will apply for LRFs activated for Demand Response. Furthermore, LRFs activated for Interruptible Load will continue to be paid for scheduled reserve in the first two instances of non-compliance. Details of the temporary scheme can be found in “Enhancing the Demand Response (DR) and Interruptible Load (IL) Programmes with a Demand Side Management Sandbox” published by EMA on 3 November 2022.

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 = *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.

$$\text{MWMQ} = \text{projected } \sum_h \sum_a \text{WMQ}_h^a,$$

where:

\sum_h = sum over all *settlement intervals* h in a calendar month

\sum_a = 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:

$$\text{MEUC} = \text{MEUA/MWMQ}$$

- 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:

$$NELC_h^{sa} = \sum_{m(sa)} [IEQ_h^{m(sa)} \times (USEP_h + HEUC_h - MEP_h^{m(sa)})]$$

where:

sa = the *settlement account* assigned to that group

h = the *settlement interval*

$\sum_{m(sa)}$ = sum over all *MNNs* m(sa) associated with *settlement account* 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 = the index position of the ranked *MNN*

m(z) = the *MNN* ranked at index position z

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) = injection *energy* quantity at the *MNN* ranked at index position z under section 4.4.3.1

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

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

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

Z = 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:

$$NEGC_h^{sa} = \sum_{z=1}^Z [T(z) \times (USEP_h + HEUC_h - MEP_h^{m(z)})] \times WPQ_{h(sa)}$$

where:

sa = the *settlement account* associated with that group

h = the *settlement interval*

Z = total number of *MNNs* for *settlement account sa*, excluding *MNNs* at which the injection energy quantity for the *settlement interval* is negative

$WPQ_{h(sa)}$ = 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:

$$NEAA_h = \sum_{sa} [NELC_h^{sa} + NEGC_h^{sa}]$$

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:

$$NEAD_h^a = NEAA_h \times [(WEQ_h^a - \sum_{sa(a)} R_{h(sa)^a}) / (\sum_j WEQ_h^j - \sum_l \sum_{sa(l)} R_{h(sa)^l})]$$

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_j = sum over all settlement accounts j

$R_{h(sa)}^a$ = minimum of $WPQ_{h(sa)}^a$ or $\sum_{m(sa)} IEQ_h^{m(sa)}$, 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

$R_{h(sa)}^a = 0$, 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

$WPQ_{h(sa)}^a$ = 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

$\sum_{sa(a)}$ = sum over all settlement accounts sa of all EGF groups whose associated loads are associated with settlement account a

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

\sum_l = sum over all settlement accounts l

- 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 SETTLEMENT 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 *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 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:

IMQ_h^i = Aggregate *intertie* import quantities (in MWh) flowing into the *transmission system* due to *intertie flows* at *MNN* i in *settlement interval* h

IXQ_h^i = Aggregate *intertie* export quantities (in MWh) flowing out of 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:

IMA_h = $\sum_i MEP_h^i \times IMQ_h^i$

where:

h = a *settlement interval*

\sum_i = sum over all *MNNs* i associated with *interties*

IXA_h = $\sum_i USEP_h \times IXQ_h^i$

where:

h = a *settlement interval*

\sum_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*.