

Notice of Market Rules Modification

Paper No.:	EMC/RCP/91/2017/340
Rule Reference:	Chapter 6 Section 11.1
Proposer:	EMC, Market Admin
Date Received by EMC:	21 Oct 2016
Category Allocated:	3
Status:	Approved by EMA
Effective Date:	01 June 2017

This rule change proposal seeks to implement the proposal for EMC to publish the half-hourly aggregate gross and net metered generation of all facility types including 'IGS' ("Proposal 3").

Proposal 3 arises from CP64 Publication of Half-Hourly Total Solar Export which studied the availability and publication of capacity, recorded generation and metered generation information for solar generation facilities (GFs) and intermittent generation facilities (IGFs) and suggested three proposals to improve the transparency of solar-related information to the industry.

At the 89th RCP meeting, CP64 was tabled for the Panel's discussion and the Panel unanimously supported Proposal 3.

At the 91st RCP meeting, the RCP by majority vote **supported** the proposed rule modifications and recommends that the EMC Board **adopt** the proposed rule modifications, as set out in **Annex 2**, to implement Proposal 3.

Date considered by Rules Change Panel:	10 January 2017
Date considered by EMC Board:	17 January 2017
Date considered by Energy Market Authority:	10 February 2017

Proposed rule modification:

See attached paper.

Reasons for rejection/referral back to Rules Change Panel (if applicable):

PAPER NO. : **EMC/BD/02/2017/06c**

RCP PAPER NO. : **EMC/RCP/91/2017/340**

SUBJECT : **PUBLICATION OF HALF-HOURLY METERED
GENERATION BY FACILITY TYPE**

FOR : **DECISION**

PREPARED BY : **JO ONG ZU ER
ECONOMIST**

REVIEWED BY : **PAUL POH LEE KONG
EVP, MARKET ADMINISTRATION**

DATE OF MEETING : **17 JANUARY 2017**

Executive Summary

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1. Introduction

This rule change proposal seeks to implement the proposal for EMC to publish the half-hourly aggregate gross and net metered generation of all facility types including 'IGS' ("Proposal 3").

2. Background

Proposal 3 arises from CP64 Publication of Half-Hourly Total Solar Export which studied the availability and publication of capacity, recorded generation and metered generation information for solar generation facilities (GFs) and intermittent generation facilities (IGFs) and suggested three proposals to improve the transparency of solar-related information to the industry.

At the 89th RCP meeting, CP64 was tabled for the Panel's discussion and the Panel unanimously supported Proposal 3, for EMC to publish the half-hourly aggregate gross and net metered generation of all facility types.

2.1 Current Availability of Metered Generation

The metered generation refers to the settlement-ready gross and net generation data of GFs registered with EMC for participation in the Singapore Wholesale Electricity Market (SWEM).

By 5.00pm on the 5th business day and 9th business day after the relevant trading day, SP Services (SPS) shall submit the relevant metering data and corrected metering data (if any) to EMC respectively for the purposes of producing the preliminary and final settlement statements in the SWEM. Such metered quantity data (in MWh) for each half-hourly settlement interval for each trading day includes the Injection Energy Quantity (IEQ) for each GF and the Withdrawal Price Quantity (WPQ) for each embedded generation facility (EGF) group. A GF's IEQ measures its gross generation. Since an EGF group's WPQ measures its generation that is for self-consumption (by the associated load), its net generation that is exported to the grid (if any) can be computed by subtracting its WPQ from its IEQ. A non-embedded GF's net generation is simply its gross generation measured by its IEQ.

For IGFs that participate in the SWEM directly, EMC and SPS have their individual half-hourly metered gross and net generation. As for IGFs that participate in the SWEM indirectly via the Central Intermediary Scheme (CIS)¹, EMC only has the aggregate data, while SPS has the individual data.

2.2 Current Publication of Metered Generation

Currently, EMC releases the daily aggregate metered gross generation (in MWh) of facility types 'CCGT', 'ST', 'GT' and 'Others', for each trading week (see **Annex 1**) in EMC's private weekly trading reports. For a weekly trading report published on Friday for the previous trading week W, the metered generation data in the report is for the trading week W-2.

However, these reports are published on EMC's private website which is accessible only by market participants (MPs) and data subscribers. Furthermore, the 'IGS' facility type, which comprises of IGFs that participate in the SWEM directly and IGFs that participate in the SWEM indirectly via the CIS, is subsumed under 'Others'.

¹ Owners of *embedded* IGFs, which are of *name-plate ratings less than 1MWac*, can choose to register them with the Market Support Services Licensee (MSSL) SP Services (SPS) under the CIS, if such embedded IGFs are *installed at the premises of contestable consumers*. SPS registers with EMC a single pseudo Generation Settlement Facility (GSF) that aggregates the IGFs registered with SPS under this scheme, so that SPS participates in the SWEM on the behalf of the owners of such IGFs.

3. Proposal

Proposed Information for Publication

Proposal 3 seeks to improve EMC’s existing release of the daily aggregate metered gross generation of facility types by:

- Publishing the half-hourly aggregate gross metered generation by facility type under Price Information on EMC’s public website² instead;
- Including the half-hourly aggregate net metered generation by facility type (derived using the formula below); and
- Using the facility types currently published by EMC (for each GF registered with EMC) according to Chapter 2 Section 5.6.2.5 of the Market Rules, i.e. ‘CCGT/Cogen/Trigen’, ‘ST’, ‘GT’ and ‘IGS’.

For each facility type,

$$\text{Half-Hourly Aggregate Net Metered Generation} = \sum_{sa} \text{Max}(\sum_{m(sa)} \text{IEQ}^{m(sa)} - \text{WPQ}_{(sa)}, 0) + \sum_n \text{IEQ}^n$$

Where:

\sum_{sa} = sum over all settlement accounts sa of EGF groups

$\sum_{m(sa)}$ = sum over all market network nodes (MNNs) m(sa) of GSFs and Generation Registered Facilities (GRFs), associated with settlement account sa

\sum_n = sum over all MNNs n of GSFs and GRFs, that are not assigned to a EGF group

The gross and net metered generation data could shed light on the overall objective of GFs, in particular IGFs, participating in the SWEM, i.e. whether the generation of such facilities are intended to serve their own load or for export to the grid.

Proposed Frequency and Format of Publication

We further propose that, for timeliness, the metered generation data be published on the 10th business day after the relevant trading day, similar to the issuance of the final settlement statement. The data should also be published substantially in the proposed format below:

Table 1: Proposed Format of Publication

Period	Gross Generation				Net Generation			
	CCGT/ Cogen/ Trigen	ST	GT	IGS	CCGT/ Cogen/ Trigen	ST	GT	IGS
1								
2								
...								
47								
48								

² <https://www.emcsg.com/marketdata/priceinformation>

4. Proposed Rule Modifications

Arising from the RCP's decision, EMC drafted the proposed rule modifications to implement Proposal 3, to publish the half-hourly aggregate gross and net metered generation by facility type. The modifications are set out in Annex 2 and summarised in Table 2.

Table 2: Summary of Proposed Rule Modifications

S/N	Chapter/ Section	Proposed Changes	Reasons for Change
1	Chapter 6 Section 11.1.1	Add that the metered generation data referred to in this section are those provided by the MSSL	To establish that the EMC shall use the energy quantities provided by the market support services licensee to determine the energy quantities specified in sections 11.1.2 and 11.1.3.
2	Chapter 6 Section 11.1.2	Add that the metered generation data for each settlement interval for each type of GF are to be published on the 10 th business day after each trading day.	To provide that the EMC shall, on the tenth business day after each trading day, publish energy quantities for each settlement interval in that trading day for each type of GF referred to in section 5.6.2.5 of Chapter 2.
3	Chapter 6 Sections 11.1.2.1 and 11.1.2.2	Add the types of metered generation data to be published and how such types of data are to be determined for each settlement interval for each type of GF.	To specify the details of the energy quantities that the EMC will publish pursuant to section 11.1.2, including the type of data to be published and the determination of the data.
4	Chapter 6 Section 11.1.3	Add how the net metered generation data is to be determined for each EGF group in each settlement interval.	To state the formula for the determination of the net injection energy quantity, for every EGF group and its associated load which are associated with the type of GF, used in section 11.1.2.2 (a).

5. Legal Sign-Off

The text of the proposed rule modifications in **Annex 2** has been vetted by EMC's external legal counsel, whose opinion is that the modifications reflect the intent of the rule modification proposal as expressed in the third column of the table in **Annex 2**.

6. Implementation Process

The breakdown of the estimated implementation time and costs of Proposal 3 is set out in Table 3 below.

Table 3: Estimated Implementation Time and Costs

Time Estimates	Effort Estimates (Man weeks)	Lapse Time (Calendar weeks)
1. Change Requirement Scoping and Analysis	3	2
2. MCE Development and Testing	5	7

Time Estimates	Effort Estimates (Man weeks)	Lapse Time (Calendar weeks)
3. User Acceptance Testing	3.5	5
4. Audit	0	0
Total Time Required	11.5	14
Cost Estimates		
1. Power Systems Consultant Resource/EMC Manpower	\$30,138 (Within EMC's budget)	
2. External resource to support (Vendor)	\$57,232	
3. Audit	N.A.	
Total Additional Cost Required	\$57,232	

7. Industry Consultation

The proposed modifications were published for industry consultation on 21 October 2016, and comments were received from PacificLight Power (PLP).

Comments from PLP

We understand that the EMC intends to publish half-hourly aggregate gross metered generation by facility type under the Price Information module of the EMC public website. PLP is supportive of the initiative for greater transparency of the market.

Consistent with our comments dated 22 August 2016 on the paper entitled "Publication of Half-Hourly Total Solar Export", PLP would like to reiterate our support on the further release of data to the market on aggregate generation of all PV systems. Notably, we would request that SPS publish the actual aggregated net injection amount from Category 3 consumers³.

EMC's Response

We note PLP's support for the proposed modifications.

With respect to PLP's request for the SPS to publish the "actual aggregated net injection amount from Category 3 consumers", the RCP has tasked EMC at the 89th RCP meeting to consult SPS on the proposal. SPS has since shared that upon assessment, the proposal is not feasible as energy injection/withdrawal for such IGFs is metered by cumulative meters, and computed and invoiced based on varying billing cycles.

8. Conclusion

We conclude that the proposed rule modifications would introduce the publication of half-hourly aggregate gross and net metered generation of all facility types including 'IGS' by EMC, so as to improve the transparency of generation information of GFs, in particular IGFs, to the industry.

³ As per [CP64 Publication of Half-Hourly Total Solar Export](#), Category 3 consumers refer to low-tension non-contestable consumers who own embedded IGFs, which are of name-plate ratings less than 1MWac, and choose to register them with the MSSSL SPS to get paid for their excess generation via the Simplified Credit Scheme.

9. RCP's Decision at the 91st RCP Meeting

At the 91st RCP meeting, the Panel by majority vote **supported** the proposed rule modifications set out in **Annex 2**. The details of the votes are as follows:

Those who voted in support of the proposal:

1. Mr. Henry Gan Representative of the EMC
2. Ms. Priscilla Chua Representative of Generation Licensee
3. Mr. Luke Peacocke Representative of Retail Electricity Licensee
4. Mr. Daniel Lee Representative of Retail Electricity Licensee
5. Mr. Sean Chan Representative of Retail Electricity Licensee
6. Mr. Dallon Kay Representative of Wholesale Electricity Trader
7. Mr. Lim Han Kwang Representative of Transmission Licensee
8. Mr. Lawrence Lee Representative of Market Support Services Licensee
9. Mr. Phillip Tan Person experienced in financial matters in Singapore
10. Dr. Toh Mun Heng Representative for the interests of the consumers of electricity in Singapore

Those who abstained from voting:

1. Mr. Soh Yap Choon Representative of PSO

10. Recommendation

The RCP by majority vote recommends that the EMC Board:

- (a) **adopt** the proposed rule modifications as set out in **Annex 2**;
- (b) **seek** the EMA's approval of the proposed rule modifications as set out in **Annex 2**; and
- (c) **recommend** that the proposed rule modifications as set out in **Annex 2** come into force **15 calendar weeks** after the date on which the approval of the Authority is published by the EMC.

Annex 1: Daily Total IEQ by Facility Type (3 – 9 Jul 2016)**Figure 22: Seven Day Summary of Generation and Consumption**

Sunday, 03 Jul 2016 to Saturday, 09 Jul 2016

	Sunday 03-Jul-16	Monday 04-Jul-16	Tuesday 05-Jul-16	Wednesday 06-Jul-16	Thursday 07-Jul-16	Friday 08-Jul-16	Saturday 09-Jul-16
IEQ (MWh)							
<i>CCGT/Cogen/Trigen</i>	126,836	141,257	141,979	126,323	138,292	137,406	128,242
<i>ST</i>	2,147	2,113	2,191	2,139	2,189	2,027	2,208
<i>GT</i>	-2	-3	-3	-2	-2	-2	-2
<i>Others</i>	518	519	465	444	515	521	507
Total	129,499	143,886	144,632	128,904	140,994	139,951	130,955
WEQ (MWh)							
Total	129,625	144,035	144,422	128,697	140,811	139,889	131,195

Note:

- 1) The metered data is provided by MSSL and this excludes corrected meter files after final settlement runs
- 2) IEQ = Injection Energy Quantity from generating facilities
- 3) WEQ = Withdrawal Energy Quantity to off-take loads
- 4) Others = Generators less than 10MW of installed capacity

Annex 2: Proposed Rule Modifications

<p>Existing Market Rules (1 October 2016)</p>	<p>Proposed Rules Changes (Deletions represented by strikethrough text and additions represented by double underlined text)</p>	<p>Reasons for rule change</p>
<p>Chapter 6</p>	<p>Chapter 6</p>	
<p>[New Section]</p>	<p><u>11 EMC RESPONSIBILITIES AFTER TRADING DAY</u> <u>11.1 PUBLISHING SETTLEMENT QUANTITY DATA</u> 11.1.1 <u>The EMC shall use energy quantities provided by the market support services licensee pursuant to section 2.2.3 of Chapter 7 to determine the energy quantities specified in sections 11.1.2 and 11.1.3.</u></p>	<p>To establish that the EMC shall use the energy quantities provided by the market support services licensee to determine the energy quantities specified in sections 11.1.2 and 11.1.3.</p>
<p>[New Section]</p>	<p>11.1.2 <u>The EMC shall, on the tenth business day after each trading day, publish the following energy quantities for each settlement interval in that trading day for each type of generation facility referred to in section 5.6.2.5 of Chapter 2:</u></p>	<p>To provide that the EMC shall, on the tenth business day after each trading day, publish energy quantities for each settlement interval in that trading day for each type of generation facility referred</p>

<p>Existing Market Rules (1 October 2016)</p>	<p>Proposed Rules Changes (Deletions represented by strikethrough text and additions represented by double underlined text)</p>	<p>Reasons for rule change</p>
		<p>to in section 5.6.2.5 of Chapter 2.</p>
<p>[New Section]</p>	<p><u>11.1.2.1</u> Total gross injection <i>energy</i> quantity (in MWh) for each type of <i>generation facility</i>, being the quantity of <i>energy</i> determined as the sum of injection <i>energy</i> quantities of all <i>generation registered facilities</i> and <i>generation settlement facilities</i> of such type; and</p> <p><u>11.1.2.2</u> Total net injection <i>energy</i> quantity (in MWh) for each type of <i>generation facility</i>, being the quantity of <i>energy</i> determined as the sum of:</p> <ul style="list-style-type: none"> (a) <u>the sum of net injection <i>energy</i> quantities for every <i>EGF group</i> and its associated <i>load</i> which are associated with such type of <i>generation facility</i>, determined in accordance with section 11.1.3; and</u> (b) <u>the sum of injection <i>energy</i> quantity of all <i>generation registered facilities</i> and <i>generation settlement facilities</i> of such type, which are not assigned to any <i>EGF group</i>.</u> 	<p>To specify the details of the energy quantities that the EMC will publish pursuant to section 11.1.2, including the type of data to be published and the determination of the data.</p>

<p>Existing Market Rules (1 October 2016)</p>	<p>Proposed Rules Changes (Deletions represented by strikethrough text and additions represented by double underlined text)</p>	<p>Reasons for rule change</p>
<p>[New Section]</p>	<p><u>11.1.3</u> The <i>EMC</i> shall determine the net injection <i>energy</i> quantity (in MWh) for each <i>EGF group</i> referred to in section 11.1.2.2(a) for each given <i>settlement interval h</i> in accordance with the following formula:</p> $\text{MAX}[\sum_{m(sa)} \text{IEQ}_h^{m(sa)} - \text{WPQ}_{h(sa)}, 0]$ <p>where:</p> <p><u>sa = the settlement account assigned to that group</u></p> <p><u>$\sum_{m(sa)}$ = sum over all <i>MNNs</i> $m(sa)$ of <i>GRFs</i> and <i>GSFs</i> of the <i>EGF group</i> that is associated with settlement account <i>sa</i></u></p> <p><u>$\text{WPQ}_{h(sa)}$ and $\text{IEQ}_h^{m(sa)}$ refer to the energy quantities provided by the market support services licensee pursuant to section 2.2.3 of Chapter 7 in respect of such <i>EGF group</i>, and the <i>GRFs</i> and <i>GSFs</i> of such <i>EGF group</i> respectively</u></p>	<p>To state the formula for the determination of the net injection energy quantity, for every EGF group and its associated load which are associated with the type of generation facility, used in section 11.1.2.2 (a).</p>