MINUTES OF THE RULES CHANGE PANEL
89th MEETING
HELD ON TUESDAY, 6 SEPTEMBER 2016 AT 10.00AM
AT ENERGY MARKET CO. PTE LTD
4 SHENTON WAY #03-01
SGX CENTRE 2, SINGAPORE 068807

Present: Paul Poh (Chairman) Priscilla Chua
Dr. Toh Mun Heng Grace Chiam
Daniel Lee Henry Gan
Luke Peacocke Lawrence Lee
Phillip Tan Marcus Tan
Dallon Kay

Absent with apologies: Soh Yap Choon Lim Han Kwang
Sean Chan

In Attendance: Wang Jing Jo Ong
(EMC) Yap Yun Ben Lucia Loh

1.0 Notice of Meeting

The Chairman called the meeting to order at 10 am. The Notice and Agenda of the meeting were taken as read.

2.0 Confirmation of Minutes of the 88th RCP Meeting

The Minutes of the 88th RCP meeting held on 12 July 2016 were noted and the RCP approved the Minutes.

3.0 Monitoring List

The RCP noted the contents of the Monitoring List.

4.0 Summary of Outstanding Rule Changes

The RCP noted the summary of outstanding rule changes.

5.0 Rules Change Work Plan Status Update

The RCP noted the update on the Rules Change Work Plan.
6.0 **Provision of Real-time Estimates of the Hourly Energy Uplift Rebate**

(Paper No. EMC/RCP/89/2016/337)

Mr. Yap Yun Ben recapped the proposal to publish a real-time estimate of the hourly energy uplift rebate (HEUR), and informed the Panel that at the 88th RCP meeting, the Panel by majority vote:

- **supported** EMC’s proposed methodology set out in section 3.2 of the paper to provide real-time estimates of HEUR
- **tasked** EMC to draft the relevant rule modifications

Mr. Yap presented the proposed rule modifications which (i) stipulate the formula for calculating Estimated HEUR, and (ii) require that the EMC includes Estimated HEUR in the list of information to be published by the EMC for each dispatch period of the forecast and real-time schedules. An explanatory note has also been added to clarify that the Estimated HEUR will not be used for settlement.

The proposed rule modifications were published for industry consultation, and comments were received from Buri Energy and Pacificlight Power. Both market participants were supportive of the proposed rule modifications.

The Panel **unanimously supported** the proposed rule modifications.

7.0 **Mid-year Review of Rules Change Work Plan 2016/17**

(Paper No. EMC/RCP/89/2016/06)

Ms. Lucia Loh informed the Panel that, as part of the Panel’s mid-year review of the rules change work plan, EMC invited stakeholders to raise any urgent issues that they wished to be addressed. At the close of submissions, EMC received the following two proposals:

- **Proposal 1**: Invalid load ramping constraints in the Rules Modification for EMA’s “Implementing Demand Response in the NEMS” (Proposed by DNV GL and NTU)

- **Proposal 2**: Proposal to Mitigate the Impact of Price Separation (Proposed by Keppel Merlimau Cogen)

EMC recommended that the RCP consider (i) urgency of the issue, and (ii) impact of the issue when deciding whether a newly raised issue should take priority over an existing work plan issue where work has not commenced.

(Mr. Dallon Kay joined the meeting at this point in time.)
### Minutes of 89th RCP Meeting – 6 September 2016

#### 7.1 Proposal 1: Invalid load ramping constraints in the Rules Modification for EMA’s “Implementing Demand Response in the NEMS”

Ms. Loh informed the Panel that this proposal pertains to the Demand Response Scheme which was directed to be implemented by the EMA. The scheme took effect on 28 April 2016.

The proposer suggested revising the ramping constraints applicable to load registered facilities (LRFs) that submit energy bids to provide load curtailments, such that they constrain the total energy consumption level of a load, and not only the dispatchable portion (as indicated by bid quantities).

EMC assessed the urgency of this issue to be low and its impact to be medium. There is currently no participation from loads providing load curtailment. Further, given that there is a price floor for such energy bids, the current spot prices mean that even if there were participating loads, they would only be scheduled for load curtailment very infrequently at current market conditions.

EMC recommended that the Panel include Proposal 1 in next year’s Rules Change Work Plan prioritisation exercise.

| 7.1.1 | Dr. Toh Mun Heng requested for information regarding the Demand Response scheme. Ms. Loh said that she would send Dr. Toh the EMA’s determination paper on Demand Response. | EMC |

| 7.1.2 | Mr. Luke Peacock asked whether EMC agreed with the proposal. Chairman replied that EMC had yet to take a view, but opined that loads usually did not have such low ramp rates and hence, did not consider this proposal to be very urgent. Mr. Peacock asked whether there was a work-around in the current Market Rules to avoid this problem, such as the load facility submitting variations to their ramp rate. Chairman clarified that the problem only happened if the participating load was large, and felt that it was more a theoretical issue rather than a practical one. Mr. Peacock accepted this explanation, and agreed with EMC’s recommendation. |  |

| 7.1.3 | The Panel **unanimously supported** including this proposal in next year’s Rules Change Work Plan prioritisation exercise. |  |
7.2 **Proposal 2: Proposal to Mitigate the Impact of Price Separation**

The proposal suggests that the EMA should immediately adopt one of two possible stop-gap measures to mitigate the impact of price separation and enhance dispatch efficiency arising from the transmission constraint between Jurong Island and Singapore mainland:

a) To pay a uniform price to constrained gencos (weighted MEP or USEP) in the event of transient market power being exercised, or

b) To impose must-run obligations on gencos with locational market power.

Ms. Loh informed the Panel that they had previously discussed at the 85th RCP meeting in March 2016, where the Panel:

- by majority vote did not support uniform pricing for generation,
- by majority vote in principle supported imposing must-run obligations to deal with locational market power, and
- wrote to inform the EMA of the RCP’s views.

She added that the EMA is also reviewing the vesting contract regime taking into account mechanisms to mitigate market power, and had released its Draft Determination Paper on 31 August 2016 for comments. The EMA does not intend to implement any locational market power mitigation measures as it is of the view that “occurrences of nodal price separation events has not been frequent or persistent in the SWEM and is not likely to become a material problem in the future as transmission network constraints will be reduced/removed over time”.

EMC recommended that Proposal 2 not be included in the Rules Change Work Plan, as it concerns market power which only the EMA can address. If the industry has any comments or suggestions, they should provide feedback to the EMA directly so that EMA can follow up on them.

7.2.1 The Panel **by majority vote supported** the recommendation to not include Proposal 2 in the Rules Change Work Plan.

The Panel members who voted in support of EMC’s recommendation are:

- Mr. Henry Gan (Representative of the EMC)
- Ms. Grace Chiam (Representative of the Generation Licensee class of market participant)
- Mr. Daniel Lee (Representative of the Retail Electricity Licensee class of market participant)
- Mr. Luke Peacocke (Representative of the Retail Electricity Licensee class of market participant)
- Dr. Toh Mun Heng (Representative for the interests of consumers of electricity in Singapore)
• Mr. Lawrence Lee (Representative of the Market Support Services Licensee)
• Mr. Dallon Kay (Representative of the wholesaler electricity market trader class of market participant)
• Mr. Phillip Tan (Person experienced in financial matters in Singapore)

The following Panel members abstained from voting:
• Mr. Marcus Tan (Representative of the Generation Licensee class of market participant)
• Ms. Priscilla Chua (Representative of the Generation Licensee class of market participant)

7.2.2 Mr. Daniel Lee commented that there is still a risk of nodal pricing divergence, and suggested that the RCP could still look at the issue of imposing must-run obligations and provide its view if the EMA does not have any objections. Chairman replied that even if the RCP looked at the issue, they could not implement anything to address it as the EMA is the proper party to address market power issues, and any implementation would have to be directed by the EMA.

Mr. Luke Peacock concurred with the view that the EMA is mandated to take the lead on issues that concern market power.

Mr. Dallon Kay suggested reiterating the Panel’s view on the urgency of this issue to the EMA. He added that while an earlier EMA information paper in 2011 indicated that the network constraints will be alleviated by 2018, no updates had been provided since then. He therefore suggested that the Panel request that the EMA provide more transparency on when the prevailing transmission constraints will be alleviated.

Mr. Peacock agreed with Mr. Kay’s suggestion for more transparency.

Mr. Daniel Lee also suggested that the Panel convey its view that there is still concern from the industry about locational market power.

7.2.3 Summing up the various suggestions, Chairman asked if the Panel wanted to make a collective representation to the EMA to:

(i) request that more information be provided on when prevailing transmission constraints will be alleviated; and

(ii) convey the view that there is still concern regarding potential exercise of locational market power,

and put this suggestion up for a vote.
7.2.4 The Panel **by majority vote supported** the suggestion for the Panel to write to the EMA. EMC will draft the letter and circulate it for the Panel's comments.

The Panel members who voted to support are:
- Mr. Henry Gan (Representative of the EMC)
- Ms. Grace Chiam (Representative of the Generation Licensee class of market participant)
- Mr. Marcus Tan (Representative of the Generation Licensee class of market participant)
- Ms. Priscilla Chua (Representative of the Generation Licensee class of market participant)
- Mr. Daniel Lee (Representative of the Retail Electricity Licensee class of market participant)
- Mr. Luke Peacocke (Representative of the Retail Electricity Licensee class of market participant)
- Dr. Toh Mun Heng (Representative for the interests of consumers of electricity in Singapore)
- Mr. Dallon Kay (Representative of the wholesaler electricity market trader class of market participant)
- Mr. Phillip Tan (Person experienced in financial matters in Singapore)

The Panel member who abstained from voting:
- Mr. Lawrence Lee (Representative of the Market Support Services Licensee)

8.0 **Price Assignment for Islanded Generation Facilities**  
(Paper No. EMC/RCP/89/2016/CP63)

Ms. Jo Ong recapped the proposal to determine prices for islanded generation facilities (GFs) in the real-time and forecast schedules ex-ante, instead of revising their anomalous prices in the real-time schedules ex-post.

As per the request of the RCP at its 88th meeting, she presented EMC's assessment of the following:

(i) the risks and complexity associated with Option 1;

(ii) the option of assigning USEP to islanded GFs (Option 3); and

(iii) the time and costs required by the status quo and Options 1 and 3,

before concluding that EMC’s recommendation is to maintain the status quo, i.e. revise prices ex-post, as there were risks and complexity associated with Option 1 i.e. derive prices ex-ante and the cost of implementing option 1 was much, higher than operational costs of maintaining the status quo.

8.1 For Option 1, Mr. Marcus Tan asked whether there are recurring costs
arising from the risks and complexity associated with Option 1. Mr. Henry Gan reiterated that the software used is Oracle and shared that the licence fee has been paid. Chairman explained that there is hence no incremental cost involved.

Mr. Henry Gan expressed his preference for Option 3 as it is a middle-of-the-road option between Option 1, which relies on a highly complex neighbouring bus algorithm, and the status quo, which requires re-runs and results in price uncertainty. His view is that assigning USEP to islanded GFs is practical for achieving price certainty for the market with a simple solution.

Mr Lawrence Lee pointed out that previously one of the TWG member's support of Option 1 was conditional on EMC Market Operations being comfortable with implementing the change. He asked what would be the outcome of the TWG's recommendation given that EMC Market Operations has now expressed concerns over the complexities associated with Option 1 and whether it was necessary for the TWG to reassess the recommendation. The Chairman replied that the alternative option considered by the TWG was to maintain status quo and it was not necessary for the TWG to reassess the recommendation.

8.2 The RCP by majority vote supported maintaining the status quo.

The following Panel member voted to support the proposal to implement Option 3:

1. Mr. Henry Gan (Representative of the EMC)

The following Panel members voted to support maintaining the status quo:

1. Ms. Priscilla Chua (Representative of Generation Licensees)
2. Mr. Marcus Tan (Representative of Generation Licensees)
3. Ms. Grace Chiam (Representative of Generation Licensees)
4. Mr. Daniel Lee (Representative of Retail Electricity Licensees)
5. Mr. Luke Peacocke (Representative of Retail Electricity Licensees)
6. Mr. Dallon Kay (Representative of Wholesaler Electricity Market Trader Licensees)
7. Mr. Lawrence Lee (Representative of the Market Support Services Licensee)
8. Mr. Phillip Tan (Person experienced in Financial Matters)
9. Dr. Toh Mun Heng (Representative of Consumers of Electricity in Singapore)
9.0 Publication of Half-hourly Total Solar Export

(Paper No. EMC/RCP/89/2016/CP64)

Ms. Jo Ong presented the proposal to publish the half-hourly aggregate actual solar export on a monthly basis, so as to provide more transparency for the industry.

Before sharing on the analysis of the proposal, Ms. Jo Ong described the various licensing and market participation requirements, as well as the alternative schemes available to intermittent generation facilities (IGFs), that give rise to the four mutually-exclusive categories across which the information available to or published by the different service providers differs.

Mr. Dallon Kay enquired on the eligibility criteria for IGFs to be aggregated by the single pseudo GSF under Category 2. Ms. Jo Ong emphasised that the IGFs are to be of name-plate ratings less than 1MWac each, embedded and installed at the premises of contestable consumers, and registered with SPS under the Central Intermediary Scheme (CIS). Mr. Kay further queried on whether there are any IGFs registered under the CIS, and whether the EMA’s 600MWac capacity threshold applies to the single pseudo GSF. Chairman confirmed that there are, but the capacity currently registered is less than 1MWac, and that 600MWac is a system-wide capacity threshold.

Ms. Jo Ong then presented on the current availability and publication of the three main types of solar-related information as follows:

1. Capacity (in MWac and MWp);
2. Metered generation (in MWh); and
3. Recorded generation (in MWac).

She also outlined the following proposals to improve the transparency of solar-related information:

- Proposal 1: For EMA to derive the estimated half-hourly aggregate solar generation from the aggregate solar installed capacity and publish this derived information at a suitable frequency;
- Proposal 2: For PSO to derive and publish the half-hourly aggregate recorded gross generation of solar GFs of name-plate rating 0.1MWac or above, together with the aggregate installed capacity of this subset of solar GFs; and
- Proposal 3: For EMC to publish the half-hourly aggregate metered gross and net generation by facility type, where the ‘IGS’ facility type comprises IGFs in Category 1 and 2.
9.1 Mr. Kay asked about the aggregate number and capacity of solar GFs of name-plate rating 0.1MWac or above and monitored by the PSO. Ms. Jo Ong replied that this is not known to the market and hence, is proposed to be published under Proposal 2.

9.2 Mr. Luke Peacocke queried on how solar irradiance data will be applied to installed capacity to estimate half-hourly generation for Proposal 1. Ms. Jo Ong responded that the estimation methodology has not been finalised by EMA/PSO. With regards to some IGFs having their output determined based on an estimated generation profile, Mr Daniel Lee commented that the estimated settlement data could be highly inaccurate if a single island-wide solar irradiance data is used for all solar PV as the actual generation would depend on the location of the solar PV.

9.3 Mr. Dallon Kay enquired about the type of substations at which solar irradiance sensors are to be installed. Ms. Jo Ong clarified that the PSO and SPPG could still be in discussion to identify the substations at which such sensors should be installed to ensure sufficient coverage of irradiance data geographically.

With respect to Proposal 2, Mr. Kay was concerned that the averaging of the minute-based output data over a half-hourly period would mask the intermittency and result in the incorrect allocation of the cost of intermittency. Ms. Jo Ong explained that the aggregate averaged data in Proposal 2 serves to be published for transparency purposes and that the correct allocation of the cost of intermittency is to be decided by EMA/PSO and is not within the part of this proposal.

9.4 Chairman shared that the EMA is examining whether more reserve and/or regulation is required to cater to IGFs’ intermittency. Mr. Daniel Lee, however, commented that he was not aware of the EMA looking at increasing regulation procurement, but reserve procurement only. Mr. Dallon Kay asserted that the issue of intermittency and the resultant cost allocation ought to be addressed the soonest possible. Ms. Wang Jing clarified that EMA and PSO are indeed examining the impact of solar on both the reserve and regulation regime and if there is any concern on the impact of IGFs on the regulation requirement, feedback can be provided to the EMA and PSO when the draft determination is published.

9.5 Chairman highlighted to the Panel that Mr. Soh Yap Choon (Representative of the PSO), though absent from the meeting, submitted his comments in advance via email. In his email, Mr. Soh shared that the PSO will be implementing Proposal 1 and that PSO will consider MPs request to include aggregate forecast generation of solar facilities in the 14 days ASA report when implementing proposal 1. Mr. Daniel Lee opined that Proposal 2 still has its merits even with the implementation of Proposal 1, and suggested for the PSO to provide the implementation details and costs of Proposal 2 by the next RCP meeting. Mr. Dallon Kay and Mr. Luke Peacocke concurred with Mr. Daniel Lee.
9.6 Lastly, Ms. Jo Ong shared that some MPs had expressed interest in forecasted data, as well as metered data of IGFs in Category 3, and raised the following proposals on publishing these data:

- For the PSO to derive and publish the **half-hourly aggregate forecasted generation of all solar GFs in the 14 days Adequacy and Security Assessment (ASA) Report** (Proposal 4)

- For SPS to derive and publish the **aggregate metered net generation of IGFs in Category 3** on a bi-monthly basis (Proposal 5)

9.7 Mr. Lawrence Lee clarified that SPS reads the meters of low-tension residential consumers with solar PV installed on a monthly and not bi-monthly basis, so as to calculate the adjustment credits. He agreed for EMC to liaise with SPS on the feasibility of Proposal 5.

9.8 Mr. Dallon Kay requested for the EMA to publish the solar PV registry, which contains the installation details of individual solar facilities.

9.9 The Panel **unanimously supported** Proposal 2, subject to the PSO’s implementation details and costs, and Proposal 3.

The Panel also tasked EMC to seek the inputs of:

- EMA on the proposal to publish the solar PV registry;

- PSO on the implementation details and costs of Proposal 2; and

- SPS on the proposal to publish the aggregate metered net generation of IGFs in Category 3.

and to update the Panel on PSO progress in implementing Proposal 1 and PSO consideration of MPs proposal to publish the half-hourly aggregate forecasted generation of all solar GFs in the 14 days Adequacy and Security Assessment (ASA) Report in March 2017.

10. **Date of Next Meeting**

The 90th RCP Meeting will be held on Tuesday, 8 November 2016.

There being no other matters, the meeting ended at 12.10 pm.