

RCP PAPER NO. : **EMC/RCP/59/2012/CP36**

SUBJECT : **APPLY CAP ON RESERVE AND REGULATION
CHARGES IMPOSE ON EMBEDDED GENERATORS**

FOR : **DECISION**

PREPARED BY : **WANG JING
SENIOR ANALYST**

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

DATE OF MEETING : **9 JANUARY 2012 / 13 MARCH 2013**

Executive Summary

An Embedded Generator (EG) is a power generation plant that generates electricity primarily for its onsite load for self-consumption and “not to compete with other generation companies to sell electricity”.

The government’s current policy allows EGs to pay non-reserve charges on a net basis. EGs are still required to pay for reserve charges (including reserve and regulation charges), on a gross basis.

Currently, all the EGs participating in the market are not qualified to provide reserve/regulation and thus not able to self hedge against reserve and regulation price hikes. It was thus proposed to cap the reserve and regulation charges paid by EGs.

Overall, we consider the existing cost allocation mechanism is equitable and consistent with the causer pays principle. Thus, we recommend that the RCP do not support the proposal.

At the 60th RCP meeting, the Panel by majority vote decided not to support the proposal.

1. Introduction

This paper discusses an issue prioritized in the Financial Year 2011/2012 Rule Change Work Plan, “Apply Cap on Reserve and Regulation Charges imposed on Embedded Generators (EG)”.

Section 2 provides a background of the arrangement for EGs and of the existing reserve cost allocation methodology in the Singapore Wholesale Electricity Market (SWEM). Section 3 analyses the proposal. Section 4 concludes.

2. Background

2.1 Existing Reserve/Regulation Cost Allocation in the SWEM

Reserve and regulation are ancillary services procured in the real-time markets. Reserve covers the shortage of generation caused by the forced outage of generators. Regulation corrects any imbalances caused by variations in the generation and consumption.

Reserve cost is only allocated to generators that are scheduled to provide 10 MW or more of energy. This is because forced outages of small generators (less than 10 MW) would not result in the activation of reserve. Instead, regulation is sufficient to cover the loss of energy from such generation facility¹. Therefore, regulation cost is charged to the first 10 MW of generation for each generator and all loads instead.

The current reserve/regulation cost allocation methodology described above is based on two important principles adopted in the design of SWEM.

- Those that cause costs must face the costs they cause
- Risk will be allocated to the party best able to manage it

In addition, all participants are free to make their own production and investment decisions. Owners of generators are given discretion to decide on the type of plants they would like to build and when or how to run their plants.

The principles discussed above form the basis of our analysis in section 3.

2.2 Current Arrangement for Embedded Generators in the SWEM

EG is a generation facility that generates electricity primarily to its onsite load for self-consumption and “not to compete with other generation companies to sell electricity”. Compared to commercial generators, which generate electricity for the primary purpose of selling them to consumers, EGs are generally smaller in capacity² and are not qualified to provide reserve and regulation³.

Initially, the market design is neutral to different types of generation plants and does not differentiate EGs from other commercial generators. The same fee and cost allocation methodology applies for all generators. Subsequently in 2008, EMA conducted a review of policy on self supply of electricity and decided to grant EGs that do not inject into the transmission

¹ During the consultation for CP23 *Allocation of Reserve Cost to Load (5% share) and Generation Settlement Facilities*, PSO confirmed that any forced outage of generation facilities less than 10 MW will only activate regulation.

² Currently, the installed capacity of the EGs in SWEM ranges from 4.8MW to 60 MW.

³ Based on PSO’s approved Standing Capability Data, currently no EGs are qualified to provide reserve or regulation.

system a status called “net treatment”. Under this scheme, EGs pay non-reserve charges (where applicable) such as PSO fees, EMC fees, Monthly Energy Uplift Charges and Market Support Services charges based on the net withdrawal/ export quantity.⁴ Commercial generators, on the other hand, are required to pay non-reserve charges based on gross generation.

Previously, EMA only granted this “net treatment” status to EGs that do not inject into the transmission system. This requirement was removed on 28 June 2011. EGs would however need to ensure that its self consumption is at least half its generation in each of the 12-month assessment period⁵.

EGs are still required to pay for reserve charges (i.e. reserve and regulation charges) on a gross basis. The existing reserve/regulation cost allocation mechanism can be summarised as in Table 1 below.

Table 1: Current reserve and regulation charge allocation

	Pay for Reserve	Pay for Regulation	Get Paid for Reserve	Get paid for regulation
Commercial Generator	For scheduled energy of more than 10 MW	For first 10MW of energy generated	For reserve scheduled to provide	For regulation scheduled to provide
EGs	For scheduled energy of more than 10 MW	For first 10MW of energy generated	Currently no, as existing EGs are not qualified to providing reserve/regulation ⁶	
Load (including associated load of EGs)	No charges	For actual amount consumed	No (except registered as Load Registered Facilities)	No

2.3 Proposed Reserve/Regulation Cap for EGs under Current Arrangement

The proposer notes that an EG, especially one with capacity of more than 10MW, is allocated both regulation and reserve costs but is unable to hedge such costs. The proposer also claims that EGs are not allowed under existing regulations to inject into the transmission system and therefore offer reserves to the market. These prevailing regulations put them at a disadvantage compared to genscos who can self-hedge against price hikes. As such, EGs are made to pay high reserve/regulation charges caused by other generators’ downtime. The proposer suggests that a cap be applied to regulation/reserve charges paid by EGs or that they be excluded from fee hikes. This would address disadvantages created by existing regulations.

⁴ The EMA’s decision paper can be found on EMA’s website http://www.ema.gov.sg/media/com_consultations/feedback_files/125084471120080421170619_2796_Assessm ent_SelfSupply_final.pdf

⁵ The EMA’s decision paper can be found on EMA’s website http://www.ema.gov.sg/media/com_consultations/feedback_files/4c319fca8c79a5_July_2010_EMA_s_Assessm ent_and_Decision.pdf

⁶ However, if an EG is physically capable of providing reserve/regulation and its reserve/regulation offer is cleared in the market, it will get paid for the reserve/regulation based on the scheduled quantity.

3 Analysis

There are several key aspects to examine in addressing if a cap should be imposed on reserve and regulation charges for EGs.

a. Are EGs (one of) the causers for the need for reserve?

There is no technical proof that EGs, compared with commercial generators of the same capacity and probability of failure, would pose less risks to the system during a forced outage. This means that EGs cause the same need for reserve as any other generator. Thus, it is economically efficient and fair to charge EGs reserve and regulation costs in the same manner as other commercial generators.

b. Are EGs best able to manage risks of their own forced outage?

Unlike commercial generators, existing EGs in the SWEM are usually not qualified to provide reserve and regulation. From this perspective, it does appear prima facie that EGs are in a less favorable position to manage their reserve and regulation costs. This is because EGs are not able to generate reserve and regulation to hedge these costs.

However, investment and consumption decisions are made by the participants themselves. EGs must have considered the pros and cons in its decision to build the generators, including the possibility that these generators are unable to provide reserve/regulation, and concluded that it is beneficial to do so. Thus, it would be perverse and unfair to now introduce a cap on reserve and regulation charges paid by EGs.

If the EGs now consider that reserve and regulations charges are at times too high, it may be opportune for them to explore risk mitigations measures. For example:

- a) Whether it would be worthwhile for them to build frequency-responsive features and offer reserve and regulation into the SWEM
- b) Consider purchasing reserve and regulation contracts from other generators that provide reserve so as to hedge their reserve and regulation cost.

Further, EGs can also manage reserve costs through improving the reliability of their generators and reducing their output. This is because smaller and more reliable generators pay a lower share of reserve cost. Setting an artificial cap on the reserve charges for EGs would mute any incentive for EGs to enhance the reliability of their generators.

In addition, the requirement for an EG not to inject into the transmission system to be eligible for “net treatment” has been removed as of 28 June 2011.

c. Should the reserve/regulation charges be capped?

As the existing cost allocation method is equitable and based on sound market design principles, we do not recommend any deviation from status quo.

It is worth noting that there are non-frequency responsive (NFR) generators that are not EGs in the SWEM⁷. These units are also allocated regulation/reserve costs in the same manner as other commercial generators. If a cap is applied on the reserve/regulation charges to EGs for the sole reason that EGs are unable to provide reserve and regulation, these cap should apply to all NFR generators in the SWEM.

⁷ They are mainly incineration plants.

Applying a cap on reserve/regulation charges implies artificially lowering costs charged to EGs and NFR generators. This could send wrong investment signals to encourage more of such generators to come on board, and in turn, result in fewer frequency responsive generators participating in the SWEM. Over time, the system may face a tight(er) supply of reserve and regulation and ultimately compromise system security.

4 Consultation

We have published the concept paper on the EMC website for comments. The following comments have been received for consideration.

Comments from Shell Eastern Petroleum

- (1) The investment and consumption decisions (as referred to in 3.b and 3.b.a) were made in the environment when there was still a restriction for an EG to inject into the transmission system. As such, the design of the system was already aligned with that restriction. Although the restriction on an EG to inject into the grid had been lifted at end-June 2011, further time, investment and certification would be needed for the EG to modify its system to that change. As such, a cap should be granted to the EG at least for an appropriate transition period.

EMC's response:

It is unclear as to how the non-injecting policy prevented EGs from providing reserve and regulation. Even if the policy had indeed prevented EGs from providing reserve/regulation, this restriction (as well as the reserve/regulation cost recovery methodology) was already in place before EGs made their investment decisions. As such, they would have considered the associated costs when they decided to build their own EG. Therefore, there is no justification for any cap to be applied.

- (2) The suggestion (as referred to in 3.b.b) to enter into a financial hedge contract for reserve and regulation with other generators is useful and practicable only if a generator offers such a service in the Singapore electricity market. An attempt in early 2011 to secure such an arrangement did not yield any willing offer from any single commercial generator in the market. We suggest that the analysis include an analysis and listing of generators that offer such hedging services in Singapore.

EMC's response

The willingness of a generator to offer an EG a hedge contract is purely a commercial arrangement between the two parties. It is entirely up to the EGs to negotiate for such contracts with the generators. EGs should have evaluated the viability of having such contracts when making their investment decisions.

5. Conclusion and Recommendation

In conclusion, we do not consider that there is justification to apply a cap on reserve and regulation charges paid by EGs.

We recommend that the RCP **not support** this proposal.

6. Decision at 60th RCP meeting

At the 60th RCP meeting, the Panel by majority vote decided not to support the proposal to apply a cap on the reserve and regulation charges imposed on EGs.

The details of the votes are as follows:

Those who voted to support the proposal

1. Mr Pak-Juan Koe (Representative of Generation Licensee)

Those who voted NOT to support the proposal

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|-----|--------------------|---|
| 1. | Mr. Toh Seong Wah | Representative of EMC |
| 2. | Mr. Kng Meng Hwee | Representatives of the Power System Operator |
| 3. | Mr. Chan Hung Kwan | Representative of Transmission Licensee |
| 4. | Mr. Lawrence Lee | Representative of the Market Support Services Licensees |
| 5. | Mr. Luke Peacocke | Representatives of Generation Licensee |
| 6. | Mr. Daniel Lee | Representatives of Generation Licensee |
| 7. | Mr. Michael Wong | Representatives of Retail Electricity Licensee |
| 8. | Mr. Dallon Kay | Representative of Wholesale Electricity Trader |
| 9. | Dr. Toh Mun Heng | Representative of Consumers of Electricity in Singapore |
| 10. | Mr. Phillip Tan | Person experienced in Financial Matters in Singapore |