

**REQUEST FOR COMMENTS AND EXPRESSION OF INTEREST  
TO PROVIDE FAST START ANCILLARY SERVICE**

**Issued on: 10 November 2023**

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## SECTION 1: INTRODUCTION

- 1.1 Centrally procured power system resources needed to ensure the security, reliability and stability of the Singapore power system are referred to as ancillary services (“**AS**”). The Singapore Wholesale Electricity Market (“**SWEM**”) rules (“**Market Rules**”) provide for the Energy Market Company (“**EMC**”) (as the Market Operator Licensee) to, at the request and on behalf of the Energy Market Authority (“**EMA**”) as the Power System Operator (“**PSO**”), procure AS under an Ancillary Service Contract (“**ASC**”) to be entered into between EMC and the Ancillary Services Provider (“**ASP**”).
- 1.2 The Singapore power system requires fast start (“**FS**”) AS that can be activated by PSO to start delivering additional electricity supply within 10 minutes to balance the power system in the event of unexpected demand increase and/or forced or unplanned outages of generating units.
- 1.3 EMA intends for EMC to call, around end-November 2023, a Request for Proposal (“**RFP**”) to provide FS AS. This document sets out the indicative RFP timeline, specifications/requirements, evaluation framework as well as key terms and conditions in the FS ASC to be awarded to the successful RFP participant(s) who will be required to build, own and operate FS generating unit(s) to provide the required FS AS.
- 1.4 Before calling the RFP, EMA would like to invite comments and expression of interest from any prospective participant of the RFP (“**Participant**”) which will be considered to finalise the RFP framework including the terms and conditions for the FS ASC to be awarded.

## **SECTION 2: CONSIDERATIONS AND TIMELINE FOR PROCURING FAST START ANCILLARY SERVICE**

- 2.1 Maintaining continuous balance between energy supply and demand in Singapore’s power system is crucial. Any imbalance in the power system could result in supply instability, disruption, or in the worst-case scenario a power system collapse. Such imbalances could be due to an unexpected increase in demand, and/or forced or unplanned outages of generating units. On the supply side, EMA will ensure sufficient generation capacity in the form of online reserves and offline FS generation capacity. Online reserves are currently mainly provided by the spare capacity of online/running combined cycle gas turbines (“**CCGTs**”). FS generation capacity is provided by offline generating units (e.g. open cycle gas turbines or “**OCGTs**”) that can be brought online within 10 minutes and reach full output within a further 15 minutes.
- 2.2 The existing OCGT units in our power system are due for replacement. To meet the FS capacity requirement of our power system, Meranti Power is building two units of OCGT (340 MW each) which are scheduled to be operational in 2025. However, the risk of new generating units tripping during commissioning and the initial years of operations are typically elevated. This risk in our power system will be especially heightened with the confluence of Meranti Power’s new OCGT generating units and two other new advanced CCGT generating units of Keppel and Sembcorp coming onstream in 2026 and 2027. EMA has assessed the need to procure FS AS to mitigate the heightened risk during this period until Meranti Power’s OCGT generating units are run in. Thereafter, the FS AS may be repurposed to provide contingency reserve and/or supply to backup electricity imports, in which case the FS AS costs would be recovered from the importers.
- 2.3 EMA therefore intends to call, through EMC, an RFP to procure 100 MW of FS AS to be available by 31 December 2024 (i.e. the FS generation capacity should be commissioned and operational by this date), with an option to provide an additional 100 MW of FS AS to be available by 31 December 2025. The successful Participant will be awarded a 25-year FS ASC, and in return build, own and operate the selected FS generating unit(s) to provide the FS AS for the duration of the ASC. EMA reserves the right to award to more than one Participant or not to award at all. Refer to **Table 1** for the indicative timeline for the RFP.

**Table 1: Indicative RFP Timeline**

<b>Milestone</b>	<b>Due Date</b>
Launch of RFP by EMA through EMC	Around end-Nov 2023
Deadline for submission of proposals by RFP participants	3.00pm (Singapore time) on 29 Feb 2024
Evaluation of proposals by EMA	Mar 2024 to Apr 2024
Notification of results to RFP participants by EMA	By end-Apr 2024

## SECTION 3: TECHNICAL PROPOSAL

3.1 Each RFP Participant shall submit a detailed **Technical Proposal** setting out how the following technical requirements will be met.

### ***FS Generation Capacity and Delivery Timeline***

3.2 The Participant shall propose to build, own and operate one or more modular FS generating units, with aggregate rated generation capacity (under Singapore ambient operating conditions) of 100 MW and commercial operation date (“**COD**”) on 31 December 2024 or earlier (“**Base Capacity**”). The Participant may also propose to build, own and operate another 100 MW of FS generating unit(s) with COD on 31 December 2025 or earlier as an option to be exercised at EMA’s discretion by no later than 31 December 2024 (“**Optional Capacity**”).

### ***Planting Site***

3.3 Each Participant shall source and secure its own land and premises to plant the proposed FS generating unit(s), including any infrastructure/equipment needed (a) to connect to the power grid and, where applicable, gas supply network, and (b) to support and sustain operations to provide the required FS AS for the duration of the 25-year FS ASC.

### ***Technical Capability***

3.4 Each FS generating unit will be subject to the following **Performance Standards**:

- (a) No more than 10 minutes for the FS generating unit to synchronise to the power grid following receipt of activation notification from PSO;
- (b) No more than 15 minutes for the FS generating unit to attain loading at its rated maximum capacity following synchronisation to the power grid;
- (c) The FS generating unit must be able to maintain loading at its rated maximum capacity for at least four (4) hours; and
- (d) The FS generating unit must be able to achieve 95% or higher **Annual Availability Factor** defined as:

$$\text{Annual Availability Factor} = \left[ 1 - \frac{\text{POH} + \text{FOH} + \text{UPOH}}{\text{TH}} \right] \times 100\%$$

where:

*POH, FOH and UPOH mean respectively the number of Planned Outage Hours, Forced Outage Hours and Unplanned Outage Hours of the FS generating unit in the year of review (year 'Y'); and*

*TH means the total number of hours in year 'Y'.*

- 3.5 Where the proposed FS generating units is capable of using natural gas and/or diesel as primary fuel (such as aeroderivative, OCGT and/or gas turbine with battery storage hybrid), natural gas as the primary fuel with the capability to start up using diesel and/or hot-switch between diesel and natural gas would be more favourably considered.
- 3.6 Each proposed FS generating unit should have a technical lifespan of 25 years from the COD and comply with the applicable technical requirements stipulated in (a) the Transmission Code and (b) the Market Rules.
- 3.7 The Participant may propose to adopt any type of FS generation technology as well as new and/or refurbished FS generating units, subject to meeting all the above requirements. Where refurbished FS generating units are proposed, they should not be an existing registered Generation Registered Facility in the Singapore power system unless there is prior approval from PSO.

### ***Operating and Testing Regime***

- 3.8 Each FS generating unit is required to remain offline unless instructed otherwise by EMA/PSO to meet power system needs.
- 3.9 EMA may allow the ASP to use specific FS generating unit(s) to supply energy and/or reserves on a commercial basis in the SWEM during specific time periods which PSO determines the FS AS from the unit(s) is not required by the power system. Such arrangement, including the specific terms and conditions thereof, will be developed on a case-by-case basis after the award of the RFP.
- 3.10 In a given month 'M', each FS generating unit will be subject to surprise testing (i.e. activation for testing purpose) by PSO in the month 'M' if the generating unit was not activated (including for testing) to run up in the preceding 20 consecutive days by PSO. Before the surprise testing is conducted by PSO in the month 'M', if there was an activation by PSO (not for surprise testing) successfully fulfilled, PSO will not conduct the surprise testing in the month 'M'.
- 3.11 The ASP is required to schedule with PSO and conduct a self-test/retest for any of its FS generating unit within 14 days following any forced outage of the FS

generating unit or unsuccessful surprise test. The FS generating unit will be deemed as unavailable (i.e. on forced or unplanned outage) from the half-hour period in which it tripped or failed the test, up to and including the half-hour period in which a self-test/retest is successfully completed. A surprise test or self-test/retest is considered successfully completed if the FS generating unit is able to (a) synchronise with the power grid and ramp-up to its rated maximum capacity within the prescribed response time as stated in paragraph 3.4(a) and 3.4(b); (b) maintain loading at its rated maximum capacity for 60 minutes; and (c) thereafter ramp down to desynchronise with the power grid without forced outage.

### ***Market Registration and Compliance with Market Rules***

3.12 The ASP must be registered with EMC as a market participant and comply with the Market Rules in respect of each FS generating unit providing the contracted FS AS.



## SECTION 4: FINANCIAL PROPOSAL

- 4.1 A 25-year FS ASC will be awarded to the successful Participant for the Base Capacity, and a separate 25-year FS ASC for the Optional Capacity if duly exercised by EMA.
- 4.2 In addition to the Technical Proposal, each Participant shall submit a **Financial Proposal** setting out the following three (3) (or if offering the Optional Capacity, five (5)) key financial parameters for the FS ASC:
- (a) CAPEX for the Base Capacity and separately for the Optional Capacity;
  - (b) Fixed OPEX for the Base Capacity and separately for the Optional Capacity; and
  - (c) Efficiency Factor (constant for the Base Capacity and Optional Capacity) which will be fixed for the entire duration of the ASC(s).

The parameters are elaborated below.

### **Capability Payment**

- 4.3 Under the 25-year FS ASC, in return for providing the FS AS, the ASP will receive an **Annual Capability Payment** calculated by the equation in 4.4, comprising two components:
- (a) Capital Expenditure (“**CAPEX**”) in the form of a fixed annual payment (in **S\$ per year**), intended to cover the ASP’s capital investment and cost of capital.
  - (b) Fixed Operating Expenditure (“**OPEX**”) in the form of an annual payment (in **S\$ per year**) adjusted annually by the Monetary Authority of Singapore (“**MAS**”)’s Core Inflation rate and an Efficiency Factor.
- 4.4 For a given year ‘T’, the Annual Capability Payment (“**ACP<sub>T</sub>**”) to the ASP is calculated as follows:

$$ACP_T = CAPEX + [ \text{Fixed OPEX}_{T-1} \times (1 + MCI_{T-1} - \text{Efficiency Factor}) ]$$

*where:*

*MCI<sub>T-1</sub> is the MAS Core Inflation rate published by MAS for year ‘T-1’; and*

*Efficiency Factor is between 0 and 1 (inclusive), up to 2 decimal places.*

- 4.5 The ASP will be paid the full ACP if the actual availability of its FS generating unit(s) is/are at or above the 95% Annual Availability Factor prescribed in 3.4(d). Actual availability below the Annual Availability Factor will result in a proportional reduction in the ACP. Accordingly, for a given year 'T', the **Ex-post Capability Payment** ("EPCP") that the ASP will be entitled to retain will be calculated as follows to take into account actual availability:

$$EPCP_T = \text{MIN} \{ [ ACP_T ] ; [ ACP_T / (0.95 \times TH_T) \times AH_T ] \}$$

*where:*

*MIN is the lower of the two derived figures in square brackets;*

*ACP<sub>T</sub> is the Annual Capability Payment for year 'T';*

*TH<sub>T</sub> is the total number of hours in year 'T'; and*

*AH<sub>T</sub> is the available hours achieved by the AS provider in year 'T'. Where there are multiple FS generating units under the FS ASC, AH<sub>T</sub> will be the weighted-average availability across all the units (specifically, by each unit's maximum rated capacity).*

### **Variable OPEX**

- 4.6 Any **Variable OPEX** prudently incurred by the ASP for carrying out surprise tests by PSO or to comply with PSO's activation instructions, will be passed through and fully recovered by the ASP.

### **Payment Regime**

- 4.7 For a given year, the ACP amount will be determined ex-ante (i.e. before the start of the year) in accordance with the equation in 4.4, and the ASP will receive the pro-rated amount on a monthly basis during the year. Any positive difference between (a) the ACP amount received by the ASP, and (b) the EPCP amount as calculated by the equation in 4.5, will have to be refunded by the ASP.
- 4.8 As for Variable OPEX (refer to 4.6), the ASP may submit a reimbursement claim to EMC with supporting documents within three (3) months of incurring the costs.

## SECTION 5: OTHER INSTRUCTIONS

### *Early Engagement with Relevant Authorities*

- 5.1 Potential Participants are strongly encouraged to commence engaging (a) the National Environment Agency on Energy Efficiency Opportunities Assessment, (b) the Singapore Civil Defence Force on Quantitative Risk Assessment, (c) the Urban Redevelopment Authority on Environmental Impact Assessment, as well as (d) PowerGas and SP PowerGrid on its gas and electricity connections respectively.
- 5.2 Where the proposed FS generating units are to be installed at an existing site that has been designated as a Special Infrastructure under the Infrastructure Protection Act (“**IPA**”), the proposed installation works may qualify as Major Renovation<sup>1</sup> under the IPA. Hence, potential Participants should also commence engaging with the Centre for Protective Security under the Singapore Police Force to ascertain whether a Security-by-Design review is required.

### *Performance Bond*

- 5.3 A Participant shortlisted by EMA to be awarded the 25-year FS ASC for the Base Capacity shall furnish a **Performance Bond** in favour of EMA for a sum of S\$10 million within three (3) business days of being notified of being shortlisted, unless otherwise approved by EMA. Otherwise, EMA may disqualify the Participant.
- 5.4 EMA will draw down S\$200,000 per day (or part thereof) of delay in the Base Capacity commencing COD beyond the agreed date.

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<sup>1</sup> Under the IPA, a Major Renovation means:

- a) in the case of any part of a building that contains a critical asset, or is a public place or is otherwise accessible to vehicles or vessels, any alteration, extension, repair, dismantling or demolition works carried out to the structure or glazing of that part;
- b) any installation or relocation of a critical asset in the premises; or
- c) any alteration, extension, dismantling or demolition works affecting the perimeter of the premises.

## SECTION 6: EVALUATION FRAMEWORK

6.1 Proposals received will be grouped into two categories based on the proposed COD for the Base Capacity:

- (a) COD in 2024; and
- (b) COD post-2024.

Proposals with COD in 2024 will be evaluated first. Proposals with COD post-2024 will be evaluated only if there are no acceptable proposals with COD in 2024.

6.2 Each proposal will be evaluated based on the following criteria.

### ***Critical Criteria***

6.3 Proposals that do not meet the following critical criteria will be disqualified and will not be considered for further evaluation:

- (a) **Timely Submission of Required Documents:** The Participant must submit the required forms and documents for the RFP by no later than 3.00pm (Singapore time) on 29 February 2024.
- (b) **Legal and Regulatory Requirements:** The Participant must be a Singapore-incorporated company that will be (a) the electricity licensee authorised by EMA to generate electricity from the proposed FS generating units and (b) the contractual party to the FS ASC to be entered into with EMC in accordance with the Market Rules. If the Participant is a consortium, the consortium must be a Singapore-incorporated entity.
- (c) **Financial Ability and Experience:** The Participant must demonstrate its ability to finance the proposed generation business and have the capability and experience to perform its duties under the Electricity Act and the electricity licence.
- (d) **Meeting Performance Standards:** The Participant must demonstrate that the technology proposed will be able to meet the performance standards stipulated in this document and the requirements in the Transmission Code.
- (e) **Track Record:** Proposals from Participants who are debarred in the RFP's time period will be rejected.

If Participants plan to submit multiple proposals, they shall consolidate all the proposals under a single application and clearly indicate the Technical Proposal and Financial Proposal corresponding to its proposal package, and whether the proposals can be adopted collectively or otherwise.

**Evaluation Criteria**

6.4 Proposals with COD of the Base Capacity in 2024 that meet the Critical Criteria will be evaluated based on the evaluation criteria in **Table 2a**.

**Table 2a: Evaluation Criteria for Proposals under Section 6.1(a)**

S/N	Criteria	Weightage	Description
1	Price Competitiveness	90%	Proposals will be assessed based on the total lifecycle cost of the Base Capacity in nominal terms based on the figures submitted by Participants under Section 4.2.
2	Proposal Quality	10%	Proposals with additional value-added service, while meeting the Critical Criteria, will score more favourably.

6.5 Proposals with COD of the Base Capacity post-2024 that meet the Critical Criteria will be evaluated based on the criteria in **Table 2b**.

**Table 2b: Evaluation Criteria for Proposals under Section 6.1(b)**

S/N	Criteria	Weightage	Description
1	Price Competitiveness	60%	Proposals will be assessed based on the total lifecycle cost of the Base Capacity in nominal terms based on the figures submitted by Participants under Section 4.2.
2	Proposal Quality	40%	(30%) Proposals with projected COD of the Base Capacity closer to the start of 2025 will score more favourably.  (10%) Proposals with additional value-added service, while meeting the Critical Criteria, will score more favourably.

## SECTION 7: INSTRUCTIONS FOR EXPRESSION OF INTEREST, SUBMISSION OF FEEDBACK AND/OR QUERIES

7.1 Please submit your feedback/queries and expression of interest to EMA using the following online form:

<https://go.gov.sg/2023fsasc>



<https://go.gov.sg/2023fsasc>

7.2 In particular, EMA would like to know the following from prospective Participants of the RFP:

- (a) Ability and interest to offer the required FS AS by the target COD of 31 December 2024 or earlier for the Base Capacity;
- (b) Technology of the FS generating unit; and
- (c) Envisaged challenges and facilitation needed from EMA.

7.3 All submissions should reach EMA by no later than **24 November 2023**. EMA will consider the information provided to finalise the RFP details and call it by around end-November 2023.