

# **Guide to Participation in the Singapore Wholesale Electricity Market**

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## 1) Introduction

The National Electricity Market of Singapore (NEMS) commenced on January 2003, which was made possible by a number of structural reforms to Singapore's electricity industry. The NEMS introduces market mechanisms into the electricity industry, so as to:

- Increase economic efficiency through competition;
- Attract private investment;
- Send accurate price signals to guide production and consumption decisions;
- Encourage innovation; and
- Provide consumer choice.

The NEMS comprises a wholesale market and a retail market. The Energy Market Company (EMC) operates the wholesale electricity market and provides a competitive and transparent trading platform for wholesale electricity trading. Like a stock exchange for electricity, all of Singapore's electricity is bought and sold through EMC. In addition to EMC, the other stakeholders in the NEMS are:

- **Energy Market Authority (EMA)** - The EMA is the regulator of the electricity industry and has the ultimate responsibility for the market framework and ensuring that the interests of consumers are protected.
- **Power System Operator (PSO)** - The PSO (a division of the EMA) is responsible for ensuring the security of supply of electricity to consumers. The PSO controls the dispatch of generation facilities, coordinates scheduled outages and power system emergency planning, and directs the operation of the transmission network.
- **Market Support Services Licensee (MSSL)** – The MSSL is authorised to provide market support services, which include consumer registration and transfer, meter reading and meter data management, retail settlement and billing, and supplying electricity to all non contestable consumers at regulated tariffs. SP Services is the only MSSL.
- **Transmission Licensee** – SP PowerAssets is the Transmission Licensee, which owns the electricity transmission and distribution networks of Singapore. It is also responsible for the operation and maintenance of the grid. SP PowerGrid is the Transmission Agent Licensee, which operates and maintains its transmission and distribution networks as the agent of SP PowerAssets.
- **Generation Licensees** – Singapore's three largest electricity generating companies are Senoko Energy Pte Ltd, PowerSeraya Ltd and Tuas Power Generation Pte Ltd. All companies that generate electricity require a Generation Licence if one or more of its generating units have an individual nameplate rating of 10MW or more.
- **Retail Electricity Licensees** – There are two types of licensed electricity retailers: market participant retailers (MPRs) and non-market participant retailers (NMPRs). MPRs have to be registered with EMC to purchase electricity from the NEMS and sell that electricity on to contestable consumers. NMPRs do not have to register with EMC to participate in the NEMS since they purchase electricity indirectly through SP Services, the MSSL.

- **Wholesaler (Generation) Licensees** – If a company has a generating unit with an individual nameplate rating of less than 10MW but more than 1MW, and if that generating unit is connected to the grid, it will require a Wholesaler (Generation) Licence.
- **Wholesaler (Interruptible Load) Licensees** – Consumers who offer to have their load interrupted, or companies that provide services to other consumers who are willing to offer their loads to be interrupted, are required to hold a Wholesaler (Interruptible Load) Licence.

The rest of this guide describes the licence and registration requirements that a new entrant buyer or seller would need to fulfill, before participating in the wholesale spot market.

## 2) EMA Licence and EMC Registration Requirements

Under the Electricity Act, you are required to obtain an electricity licence from the EMA to carry out any of the following activities unless exempted<sup>1</sup>:

- Generation of electricity
- Retailing of electricity
- Transmission of electricity
- Import or export electricity
- Trade in any wholesale electricity market
- Provide any market support services

In addition, if you would like to participate in the wholesale electricity market, you are required to:

- Register with EMC as a Market Participant (MP); and
- Register with EMC your facility providing the service (e.g. generator), if applicable.

Please refer to the following resources for more details:

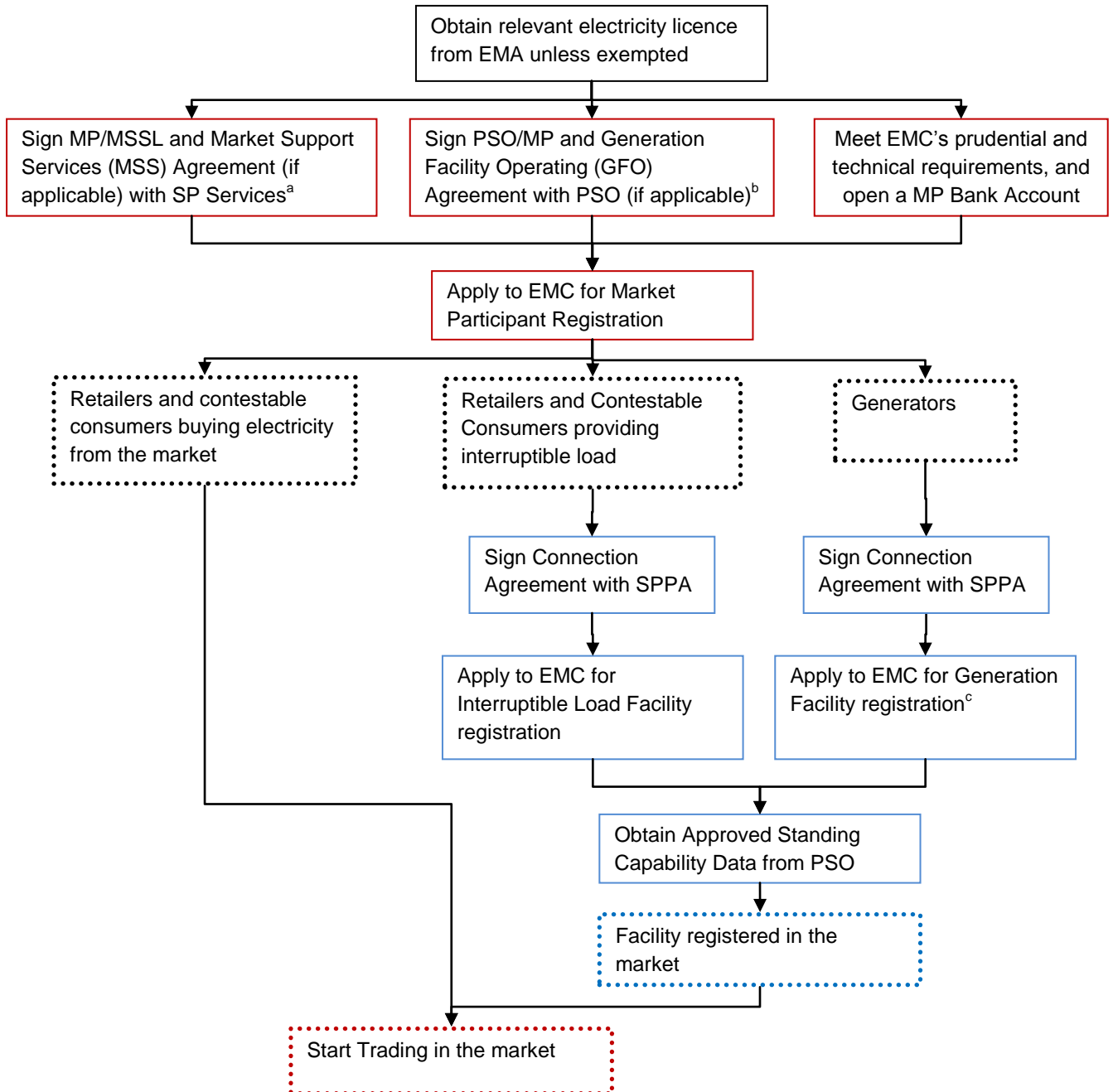
- **Annex A** – Reference Table for the exact type of EMA Licence and/or EMC Registration you should apply for
- **Annex B** – Description and Application Weblinks for EMA Licences
- **Annex C** – Description and Application Weblinks for EMC Registration

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<sup>1</sup> For the list of exemption orders granted by EMA, please refer to EMA's website at: <http://www.ema.gov.sg/page/60/id:130/>

### 3) EMC Registration Process

An overview of the registration process is shown below:



<sup>a</sup> Any MP who is only a Wholesaler of Interruptible Load does not need to sign a MP/MSSL agreement with SP Services.

<sup>b</sup> The Generation Facility Operating (GFO) Agreement is required to establish a contractual relationship between the PSO and Generation Licensee. This is to allow the PSO to dispatch the Generation Licensee's generation facility(s).

<sup>c</sup> As long as the commissioning of a Generation Facility requires it to be connected to the Grid, it should first be registered as a CGF.

Table 1 below details the estimated processing time for fulfilling the various requirements:

**Table 1: Details of EMC Registration**

| <b>Registration of</b>                                     | <b>Key Requirements</b>   | <b>Estimated Processing Time</b>  |
|--|---|---|
| Market Participant   | <ul style="list-style-type: none"> <li>a) <i>EMC's prudential requirements</i><sup>2</sup></li> <li>b) <i>PSO-MP and PSO-GFO agreements (if applicable)</i><sup>3</sup></li> <li>c) <i>MP-MSSL agreement</i><sup>4</sup></li> <li>d) <i>Electricity licence unless exempted</i></li> <li>e) <i>EMC's technical requirements</i></li> <li>f) <i>MP bank account</i></li> </ul>   | 20 business days from the receipt of complete form, with no further info requested by EMC.                              |
| Facility<br>(Commissioning<br>Generation Facility,<br>CGF) | <ul style="list-style-type: none"> <li>a) <i>EMC's requirements</i>, which includes identifying a dispatch coordinator for the facility</li> <li>b) <i>PSO's requirements</i>, which includes completing the facility registration form</li> <li>c) <i>Connection agreement</i></li> <li>d) <i>Metering requirements</i></li> <li>e) <i>Certificate of Undertaking</i> of MP's operational control and authority over the facility</li> </ul> | 30 business days from the receipt of complete form, with no further info requested by EMC.                              |
| Facility (Generation<br>Registered Facility,<br>GRF)       | <ul style="list-style-type: none"> <li>a) <i>EMC's requirements</i></li> <li>b) <i>PSO's requirements</i>, which includes completing facility registration form and respective supporting documents (e.g. test reports)</li> <li>c) <i>Connection agreement</i></li> <li>d) <i>Metering requirements</i></li> <li>e) <i>Certificate of Undertaking</i> of MP's operational control and authority over the facility</li> </ul>                 | 30 business days from EMC being satisfied that the facility meets all requirements for generation facility registration |
| Facility (Generation<br>Settlement Facility,<br>GSF)       | <ul style="list-style-type: none"> <li>a) <i>EMC's requirements</i></li> <li>b) <i>PSO's requirements</i>, which includes completing the facility registration form and respective supporting documents (e.g. test reports)</li> <li>c) <i>Connection agreement</i></li> <li>d) <i>Metering requirements</i></li> </ul>   | 30 business days from EMC being satisfied that the facility meets all requirements for generation facility registration |

<sup>2</sup> If you satisfy only the key requirements (a) and (b), the EMC may conditionally register you as a MP, so that you may commence the process of registration of your facilities. However, you must satisfy all the key requirements stated above, before you can be registered as a MP and your facilities can be registered.

<sup>3</sup> The Generation Facility Operating (GFO) Agreement is required to establish a contractual relationship between the PSO and Generation Licensee. This is to allow the PSO to dispatch the Generation Licensee's generation facility(s).

<sup>4</sup> Load Registered Facilities providing interruptible load do not require a MP-MSSL agreement.

| Registration of                          | Key Requirements  | Estimated Processing Time   |
|--|---|---|
|  | e) <i>Certificate of Undertaking</i> of MP's operational control and authority over the facility  |   |
| Facility (Load Registered Facility, LRF) | a) <i>EMC's requirements</i><br>b) <i>PSO's requirements</i> , which includes completing the facility registration form and respective supporting documents (e.g. test reports)<br>c) <i>Certificate of Undertaking</i> of MP's operational control and authority over the facility | 30 business days from EMC being satisfied that the facility meets all requirements for load facility registration |

#### 4) Frequently Asked Questions

##### *General*

Q) What is the typical settlement cycle for MPs participating in the market (i.e. when do I get paid and when do I need to pay?)

A) Based on the final settlement statement issued to the MP, on the 10<sup>th</sup> business day (BD) after the trading day (T), EMC shall issue electronic funds transfer instructions to the clearing bank instructing the clearing bank to:

- (i) Debit the net settlement amount from the MP's bank account, on the 20<sup>th</sup> calendar day after T
- (ii) Credit the net settlement amount to the MP's bank account, on the 21<sup>st</sup> calendar day after T

Please refer to Chapter 7 of the Market Rules and Section 9 of the Settlement Market Manual for more details of this process.

##### *Generators*

Q) If I am an embedded generation facility (EGF), what do I need to do and what information do I need to provide?

A) The EMA's approval is required for classification as an EGF. As an EGF, you are able to enjoy Net Treatment on non-reserve charges and can apply to the EMA to be granted Price Neutralisation (PN). Please inform EMC in advance if you are in the process of applying for EGF or PN. Upon the EMA's approval, EMC will classify your generation facility accordingly. You may refer to the EMA's information paper on the conditions under which it will grant such an approval:

[http://www.ema.gov.sg/media/com\\_consultations/feedback\\_files/4c319fca8c79a5\\_July\\_2010\\_EMA\\_s\\_Assessment\\_and\\_Decision.pdf](http://www.ema.gov.sg/media/com_consultations/feedback_files/4c319fca8c79a5_July_2010_EMA_s_Assessment_and_Decision.pdf)

Q) Where can I find information on the energy prices my generation facility will be paid, and the associated charges and fees, for every MWh of electricity sold to the market?

A) For every MWh of electricity sold, you will be paid at the nodal energy price determined for your generation facility. At the same time, you will need to pay an Allocated Regulation Price (AFP) charge, as well as PSO and EMC fees. You can find information on nodal energy prices, PSO/EMC fees and AFP charge from our website (<http://www.emcsg.com/marketdata/priceinformation>). To be able to view PSO/EMC fees and AFP charge, please download data on “Wholesale Electricity Prices”.

### Consumers

Q) I am a consumer who is currently using a retailer but would like to switch to being a Direct Market Participant (DMP). Other than registering as an MP to do so, what other documents or information should I provide EMC to ensure a smooth process?

A) EMC would need to submit a Customer Transfer Request (CTR) on your behalf to the MSSL before you can participate in the wholesale electricity market as a DMP. To do this, we need the following information from you: company name, account number, and postal code.

### Other Sources of Information

If you require more information on Singapore’s electricity industry, in general or the related legislations or regulations, please visit the EMA website at [www.ema.gov.sg](http://www.ema.gov.sg).

For additional information on the wholesale electricity market of the NEMS (e.g. the Market Rules that govern the NEMS, market data, etc.), please visit the EMC website at [www.emcsg.com](http://www.emcsg.com).

## 5) Useful Contacts

You may find the following contacts useful if you have further queries on the respective issues.

| Enquiry on  | Organisation | Officer   | Email                   | Phone Number |
|---|--------------|---|-------------------------|--------------|
| Licence from EMA<br>Application for EGF and/or PN   | EMA          | Lee Ming Tao<br>Deputy Director, Economic Regulation and Licensing Dept | lee_ming_tao@ema.gov.sg | 63767552     |
| Registration with EMC and registration requirements | EMC          | Ms Wang Jing<br>Senior Analyst, Market Administration Team              | jing.wang@emcsg.com     | 65719875     |

| Enquiry on   | Organisation | Officer  | Email                           | Phone Number |
|--|--------------|--|---------------------------------|--------------|
| PSO-MP and PSO-GFO Agreements                                | PSO          | Ms Agnes Tan<br>Deputy Director, DCE's Office                    | tan_siew_huay@ema.gov.sg        | 68727317     |
| MP-MSSL Agreement or Market Support Services (MSS) Agreement | MSSL         | Budiman Roesli<br>Assistant Director, Regulatory Affairs         | budiman@singaporepower.com.sg   | 68238285     |
| Transmission Issues  | SP PowerGrid | Bernard Tay Shang Hong<br>Senior Engineer, Transmission Planning | shanghong@singaporepower.com.sg | 68238542     |

## 6) Glossary

### *aggregate nameplate*

Total sum of the nameplate ratings of all generation facilities within a generation station.

### *contestable consumers*

Those consumers that have the right to choose to purchase electricity from a retailer, directly from the wholesale market or indirectly from the wholesale market through the Market Support Services Licencee (MSSL), SP Services. Consumers qualify to be contestable based on their level of electricity consumption.

### *dispatch schedule*

A schedule produced by the market clearing engine every half-hour that is the basis for the supply of energy, reserve and regulation in the market.

### *embedded generation facility*

A generation facility installed to generate and supply electricity primarily (i.e. at least 50% of its generation output) for its own use at its own load facilities.

### *interruptible load (IL)*

A contestable consumer that participates in the wholesale market and allows its supply of electricity to be interrupted in the event of a system disturbance in exchange for reserve payment.

### *market participant (MP)*

A person who has an electricity licence issued by the Energy Market Authority (EMA) or is exempted from doing so, and has been registered with EMC as a market participant

*net treatment of non-reserve charges for embedded generation facility*

Since June 2011, non-reserve charges (EMC fees, PSO fees, Monthly Energy Uplift Charges [MEUC] and Market Support Services [MSS] charges) for embedded generation facilities will be administered based on their amount of net withdrawal (consumption) from, or net injection (generation) into the grid. To qualify for this treatment, an embedded generation facility requires approval from the EMA and registration with EMC as an embedded generation facility.

*non-contestable consumers*

Consumers that are supplied by the MSSL, SP Services, at a regulated tariff. These consumers have not been given the right to choose to purchase electricity from either a retailer, directly from the wholesale market or indirectly from the wholesale market through the MSSL, SP Services.

*price neutralisation*

The equalisation of the price differential between the electricity injection and withdrawal nodes using a credit/debit factor. The purpose of price neutralisation is to allow embedded generators that generate electricity for its own consumption to offset generation against their associated load so that only excess generation at each node is paid at the respective market energy price, or excess load is charged at (USEP+HEUC) in energy settlement.

*regulation*

Generation that is on-line to fine-tune the imbalance between generation and load.

*reserve*

On-line generation capacity or interruptible load that can be drawn upon when there is an unforeseen tripping of generating unit(s).

*subject to dispatch*

When a generation facility is subject to dispatch, it means that the facility can generate electricity only based on the dispatch schedule or upon the dispatch instructions of the PSO.

*wholesale market*

The transactions made between generation companies and retail companies.

*Disclaimer*

*While Energy Market Company Pte Ltd has made reasonable efforts to ensure that the information contained in this registration guide is accurate and complete, this guide is prepared and provided for general information purposes only. As such, you should always consult a suitably qualified professional, refer to the relevant legislations and rules including the Electricity Act, Electricity Market Rules and Market Manuals and independently assess the information provided in this guide to make your decision. If you have any specific queries about this guide or its contents, contact us at [MPRegistration@emcsq.com](mailto:MPRegistration@emcsq.com).*

Annex A

Reference Table on EMA Licences and EMC Registration Requirements

| I am a  | I would like to   | Licence needed from EMA         | Registration needed from EMC   |
|---|---|---------------------------------|--|
| Generator with nameplate rating $\geq 10\text{MW}$  | Generate subject to dispatch, and inject electricity into the grid            | Generation Licence              | Register as a MP<br><br>Register generation facility as a CGF first, and then subsequently as a GRF  |
| Generator with nameplate rating $\geq 1\text{MW}$ and $< 10\text{MW}$ , and aggregate nameplate rating $\geq 10\text{MW}$ | Generate subject to dispatch, and inject electricity into the grid            | Wholesaler (Generation) Licence | Register as a MP<br><br>Register generation facility as a CGF first, and then subsequently as a GRF  |
| Generator with nameplate rating $\geq 1\text{MW}$ and $< 10\text{MW}$ , and aggregate nameplate rating $< 10\text{MW}$    | Generate subject to dispatch, and inject electricity into the grid            | Wholesaler (Generation) Licence | Register as a MP<br><br>Register generation facility as a CGF first, and then subsequently as a GRF  |
|   | Generate <b>not</b> subject to dispatch, and inject electricity into the grid | Wholesaler (Generation) Licence | Register as a MP<br><br>Register generation facility as a GSF. However, if facility is required to connect to the grid for commissioning purposes, then it would need to be registered first as a CGF. |
|   | Not connect facilities to the grid  | No licence required             | No registration required   |
| Generator with nameplate rating $< 1\text{MW}$  | Participate in the market and get paid for electricity exported to the grid   | No licence required             | Register as a MP<br><br>Register generation facility as a GSF. However, if facility is   |

| I am a   | I would like to   | Licence needed from EMA | Registration needed from EMC   |
|----------|---|-------------------------|--|
|          |   |                         | required to connect to the grid for commissioning purposes, then it would need to be registered first as a CGF.  |
|          | Participate in the market under another MP and get paid for electricity exported to the grid <sup>5</sup> | No licence required     | Do not need to register as a MP.<br><br>Register facility with EMC through the other MP.   |
|          | Export electricity but do not expect to get paid  | No licence required     | No registration required   |
|          | Not connect facilities to the grid  | No licence required     | No registration required   |
| Retailer | Retail electricity  | Retailer Licence        | Register as a MP   |
|          | Register generation facilities (less than 1 MW) on behalf of its clients                                  | Retailer Licence        | Register as a MP<br><br>Register generation facility as a GSF. However, if facility is required to connect to the grid for commissioning purposes, then it would need to be registered first as a CGF. |
|          | Register interruptible load facilities on behalf of its clients   | Retailer Licence        | Register as a MP<br><br>Register interruptible load facility as a LRF  |

<sup>5</sup> Load facilities and small generators (nameplate rating <1MW) can choose for their facilities to be registered by EMC under another MP (e.g. their retailers, who hold an electricity licence both to retail electricity and to trade in the wholesale electricity market). In this case, the MP will be responsible for ensuring the load facility / generator complies with the market rules.

| <b>I am a</b>   | <b>I would like to</b>   | <b>Licence needed from EMA</b>                  | <b>Registration needed from EMC</b>   |
|---|--|---|---|
| Company with interruptible load facilities                            | Get paid for allowing PSO to interrupt my load in a contingency event.   | Wholesaler (Interruptible Load Service) Licence | Register as a MP<br><br>Register interruptible load facility as a LRF                 |
| Non-contestable Consumers with generating unit below 1MW <sup>6</sup> | Export electricity to the grid and get paid for energy by SPS  | No licence required                             | No registration with EMC is required. Need to inform SPS for credit adjustment by SPS |
| Contestable Consumer with generating unit below 1MW                   | Export electricity to the grid and get paid  | No licence required                             | Register as a MP<br><br>Register generation facility as a GSF                         |
|   | Participate in the market under another Licensed Retailer and get paid for electricity exported to the grid <sup>7</sup> | No licence required                             | Licensed Retailer to register generation facility as a GSF                            |
|   | Export electricity to the grid and do not expect to get paid   | No licence required                             | No registration required.   |
| Contestable Consumer <sup>8</sup>                                     | Purchase your own consumption of electricity directly from the market  | No licence required                             | Register as a MP  |

<sup>6</sup> At the moment, only non-contestable consumers with generating unit below 1MW are exempted from registering with the EMC to participate in the market and get paid for the electricity they export to the grid. This will be done via credit adjustments made by SP Services to their electricity bill – for more details on this process, refer to “Handbook for Solar PV Systems” on EMA website: [http://www.ema.gov.sg/images/files/EMA%20Solar%20Handbook\\_Apr%202011.pdf](http://www.ema.gov.sg/images/files/EMA%20Solar%20Handbook_Apr%202011.pdf)

<sup>7</sup> Contestable consumers with small generators (nameplate rating <1MW) can choose for their facilities to be registered by EMC under another MP (e.g. their retailers, who hold an electricity licence both to retail electricity and to trade in the wholesale electricity market). In this case, the MP will be responsible for ensuring the consumer complies with the market rules.

<sup>8</sup> For more details on purchasing electricity for your own consumption directly from the market and the ensuing MP registration with EMC, please refer to “Direct Market Consumer Guide” on EMC website: <http://www.emcsg.com/AboutTheMarket/MarketParticipation/DirectConsumers>

**Annex B**
**EMA Licences**

The key types of licences granted by the EMA are shown in the table below:

**Table B1: Types of EMA Licences**

| <b>Type of Licence</b>                  | <b>Required by</b>  | <b>Link for Application</b>   |
|---|---|---|
| Generation Licensee                     | A person who generates electricity via a generating unit with nameplate rating of 10MW and above. The licence must authorize the licensee to trade in the wholesale market. | <a href="http://www.ema.gov.sg/page/126/id:116/">http://www.ema.gov.sg/page/126/id:116/</a> |
| Retail Electricity Licensee             | A person who sells electricity to contestable consumers. The licence must authorize the licensee to trade in the wholesale market.  | <a href="http://www.ema.gov.sg/page/126/id:116/">http://www.ema.gov.sg/page/126/id:116/</a> |
| Wholesaler (Interruptible Load Service) | A person who offers reserve into the SWEM, by opting to interrupt its load facility's consumption of electricity, for payment.  | <a href="http://www.ema.gov.sg/page/126/id:116/">http://www.ema.gov.sg/page/126/id:116/</a> |
| Wholesaler (Generation)                 | A person who sells electricity generated via generating unit(s) with nameplate rating of 1MW or more but less than 10MW and connected to the transmission system.           | <a href="http://www.ema.gov.sg/page/126/id:116/">http://www.ema.gov.sg/page/126/id:116/</a> |

## Annex C

### EMC Registration

The EMC website has published the registration forms for each type of registration. To register as a MP or register a facility, you should download, complete and submit the relevant form(s) to EMC<sup>9</sup>. Each form contains explanatory notes and a checklist to help you complete the form. The key types of registration by the EMC are shown in the table below:

**Table C1: Types of EMC Registration**

| Type of Registration                    | Description   | Link for Application  |
|---|---|---|
| Market Participant                      | A person who is registered, in accordance with the market rules, to participate in the SWEM by injecting electricity into the grid and/or trading (buy/sell electricity or be paid for offering reserve) in the SWEM.   | <a href="http://www.emcsg.com/AboutTheMarket/MarketParticipation/MarketParticipantRegistration">http://www.emcsg.com/AboutTheMarket/MarketParticipation/MarketParticipantRegistration</a>   |
| <b>Generation Facility Registration</b> |   |   |
| Commissioning Generation Facility (CGF) | <p>All GRFs must first be registered as CGFs to undergo commissioning tests.</p> <p>Generation facilities who wish to be registered as a GSF would need to be registered as a CGF first, if facility is required to connect to the grid for commissioning purposes.</p> <p>CGF registration is an interim arrangement that expires upon PSO's approval of your generation facility's final commissioning test<sup>10</sup>.</p> <p>Market rules applying to a generation facility will similarly apply to a CGF, including payment for every MWh of electricity injected into the grid, along with the associated charges and fees.</p> | <a href="http://www.emcsg.com/AboutTheMarket/MarketParticipation/GenerationFacilityRegistration">http://www.emcsg.com/AboutTheMarket/MarketParticipation/GenerationFacilityRegistration</a> |

<sup>9</sup> If you hold more than one electricity licence and, pursuant to those licences, intend to perform different functions in the SWEM, you must submit separate applications for each function.

<sup>10</sup> If you intend for your generation facility to continue generating and injecting into the grid, you should submit your application for GRF registration in tandem with your CGF registration and work with PSO/EMC to ensure that your GRF registration will be approved on the day that your CGF registration expires.

| Type of Registration                 | Description  | Link for Application   |
|--------------------------------------|--|--|
| Generation Registered Facility (GRF) | <p>A generation facility which generates, subject to dispatch, and injects electricity into the grid.</p> <p>Being subject to dispatch means that the GRF is required to offer its expected generation quantities for every dispatch period, and to generate according to its dispatch schedule.</p> |  |
| Generation Settlement Facility (GSF) | <p>A generation facility which generates, not subject to dispatch, and injects electricity into the grid.</p>  |  |
| <b>Load Facility Registration</b>    |  |  |
| Load Registered Facility (LRF)       | <p>A load facility whose consumption of electricity could be interrupted, based on its offers of reserve into the SWEM.</p>  | <p><a href="http://www.emcsg.com/AboutTheMarket/MarketParticipation/LoadFacilityRegistration">http://www.emcsg.com/AboutTheMarket/MarketParticipation/LoadFacilityRegistration</a></p> |