



Smart Energy, Sustainable Future

CONSULTATION PAPER FOR PROPOSED MODIFICATIONS TO THE METERING CODE

**Closing date for submission of comments and feedback:
12 Nov 2021, 5 p.m.**

12 NOV 2021

ENERGY MARKET AUTHORITY
991G Alexandra Road
#01-29 Singapore 119975
www.ema.gov.sg

Please direct any enquiries by e-mail to: EMA_ES@ema.gov.sg

Disclaimer:

The information in this Consultation Paper is not to be treated by any person as any kind of advice. The Energy Market Authority shall not be liable for any damage or loss suffered as a result of the use of or reliance on the information given in this Consultation Paper.

1 Introduction

- 1.1. The Metering Code sets the minimum conditions that a metering service provider must meet in carrying out its obligation to provide services to metered entities. It also sets out the rights and obligations of metering service providers and metered entities in respect of both the wholesale electricity market and the retail electricity market. Specifications for meter installations and equipment are also described in the Code.

2 Proposed modifications to the Metering Code

- 2.1. Pursuant to Section 1.7 of the Metering Code, the Energy Market Authority (EMA) seeks representations on the proposed modifications to the Metering Code as set out in Appendix 1.
- 2.2. The proposed modifications seek to modify the metering requirements for generation facilities of installed capacity 10MW or lower that are connected to the distribution network, and include new technical requirements relating to electricity import. In addition, the proposed modifications seek to provide clarity on the respective Licensees who are required to comply with the Metering Code as a condition of its electricity licence.

3 Invitation to submit representations

- 3.1. EMA invites written representations on the proposed modifications to the Metering Code as set out in Appendix 1.
- 3.2. Please send your written representations by e-mail to:

[**EMA_ES@ema.gov.sg**](mailto:EMA_ES@ema.gov.sg)

Alternatively, you may send your submission by post/fax to the following address:

*Electricity System Department
Industry Regulation Division
Energy Market Authority
991G Alexandra Road, #01-29
Singapore 119975.
Fax: (65) 6 835 8020*

Please use the form given in Appendix 2 for your representations.

- 3.3. Anonymous representations will not be considered.
- 3.4. All representations must reach EMA by 5 pm on 12 Nov 2021.
- 3.5. EMA will acknowledge receipt of all submitted representations electronically. Please contact Mr Melvin Goh at 6376 7482 or Mr Yeo Eng Houw at 6376 7509

if you have not received an acknowledgement of your submitted representation within two business days.

- 3.6. EMA reserves the right to make public all or any part of any written representation and/or to disclose the identity of the party who made the representation. Where a respondent considers any part of his representation to be confidential, he shall clearly mark and place such part of his representation as an annex. EMA will take this into account regarding disclosure of the information submitted.
- 3.7. This Consultation Paper shall constitute notice of the proposed modifications to the Metering Code set out in Appendix 1, for the purpose of Section 1.7 of the Metering Code.

~ End ~

Energy Market Authority of Singapore

Appendix 1

PROPOSED MODIFICATIONS TO THE METERING CODE

Modification Ref. No.	Clause	Original text	Modified text or addition	Reason for modification or addition
MC/2021/1	1.2.1	Subject to section 1.2.2, this Code applies to a Licensee who is subject to this Code as a condition of its electricity licence.	Subject to section 1.2.2, this Code applies to a Licensee who is subject to this Code as a condition of its electricity licence <u>and a Licensee defined in section 1.4.1 of this Code.</u>	To provide clarity on the respective Licensees who are required to comply with this Code as a condition of its electricity licence.
MC/2021/2	1.4.1	“connect” means in respect of a consumer’s or Generation Licensee’s installation, to put into place a physical link between the relevant service connection and the relevant connection point, but excluding the physical link between the service connection termination and the installation, and “connection”, “disconnection”, “reconnection” and all grammatical variations thereof shall be interpreted accordingly, provided that the term “disconnection” shall be interpreted to mean the removal of the physical link and/or discontinuing the flow of electricity to or from an installation;	“connect” means in respect of a consumer’s or Generation Licensee’s <u>or import licensee’s</u> installation, to put into place a physical link between the relevant service connection and the relevant connection point, but excluding the physical link between the service connection termination and the installation, and “connection”, “disconnection”, “reconnection” and all grammatical variations thereof shall be interpreted accordingly, provided that the term “disconnection” shall be interpreted to mean the removal of the physical link and/or discontinuing the flow of electricity to or from an installation;	Extending the definition for connect to include Import licensee

Energy Market Authority of Singapore

Modification Ref. No.	Clause	Original text	Modified text or addition	Reason for modification or addition
MC/2021/3	1.4.1	<p>“connection point” means</p> <ul style="list-style-type: none"> • for a load, the point at which the circuit breaker or other isolating device owned and controlled by the Transmission Licensee is located on the Transmission Licensee’s side of a service connection, other than that of an interconnector; and • for a generating station, the point at which the Transmission System is terminated at the Generation Licensee’s installation; 	<p>“connection point” means</p> <ul style="list-style-type: none"> • for a load, the point at which the circuit breaker or other isolating device owned and controlled by the Transmission Licensee is located on the Transmission Licensee’s side of a service connection, other than that of an interconnector; and • for a generating station, the point at which the Transmission System is terminated at the Generation Licensee’s installation; • <u>for a generating station, the point on the transmission system where the generating station is connected to; and</u> • <u>for an <i>import facility</i>, the point on the transmission system where the <i>import facility</i> is connected to.</u> 	Extending the definition for connection point to include import facility
MC/2021/4	1.4.1	New definition	<p><u>“electricity licence” has the same meaning as in the Act;</u></p>	To provide clarity on the respective Licensees who are required to comply with this Code as a condition of its electricity licence.

Energy Market Authority of Singapore

Modification Ref. No.	Clause	Original text	Modified text or addition	Reason for modification or addition
MC/2021/5	1.4.1	New definition	<p><u>“Licensee” means:</u></p> <ul style="list-style-type: none"> (i) <u>a Generation Licensee;</u> (ii) <u>an Importer Licensee;</u> (iii) <u>a Market Company Licensee;</u> (iv) <u>a Market Support Services Licensee;</u> (v) <u>a Retail Electricity Licensee;</u> (vi) <u>a Transmission Licensee;</u> (vii) <u>a Wholesaler Licensee;</u> 	To provide clarity on the respective Licensees who are required to comply with this Code as a condition of its electricity licence.
MC/2021/6	1.4.1	“Generation Licensee” means a person who is authorised by an electricity licence to generate electricity;	<p>“Generation Licensee” means a person who is authorised by an electricity licence to generate electricity <u>has the same meaning as in the Act;</u></p>	To align with the definition in the Act.

Energy Market Authority of Singapore

Modification Ref. No.	Clause	Original text	Modified text or addition	Reason for modification or addition
MC/2021/7	1.4.1	New definition	<p><u>“import facility” means an installation in Singapore wherein electricity imported from an electricity system or generation facility located outside Singapore via High Voltage Direct Current (HVDC) or High Voltage Alternating Current (HVAC) interconnector is transmitted to the transmission system. An import via HVDC supply may comprise a HVDC facility, a subsea cable landing point, HVDC interconnector, an energy storage system and all auxiliary equipment. Whilst an import via HVAC supply may comprise a subsea cable landing point, HVAC interconnector, an energy storage system and all auxiliary equipment.</u></p> <p><u>“Importer Licensee” means a person who is authorised by an electricity licence to import electricity into Singapore.</u></p>	To include new definition for import facility and Importer Licensee
MC/2021/8	1.4.1	New definition	<p><u>“Market Company Licensee” means the company which holds an electricity licence authorising it to operate any wholesale electricity market pursuant to section 42 of the Act;</u></p>	To provide clarity on the respective Licensees who are required to comply with this Code as a condition of its electricity licence.

Energy Market Authority of Singapore

Modification Ref. No.	Clause	Original text	Modified text or addition	Reason for modification or addition
MC/2021/9	1.4.1	New definition	<u>“Retail Electricity Licensee” has the same meaning as in the Act;</u>	To provide clarity on the respective Licensees who are required to comply with this Code as a condition of its electricity licence.
MC/2021/10	1.4.1	“Market Support Service Licensee” means a person who is authorised by an electricity licence to provide market support services	“Market Support Service Licensee” means a person who is authorised by an electricity licence to provide market support services <u>has the same meaning as in the Act;</u>	To align with the definition in the Act.
MC/2021/11	1.4.1	“metered entity” means a consumer, Generation Licensee, Wholesaler Licensee (Generation) or any other person responsible for the flow of electricity measured by a meter at which the transmission system is terminated at the associated installation, and shall include the Transmission Licensee or any person through whose plant or equipment there is a flow of electricity that is being metered for the purposes of settlement by an electricity licensee;	“metered entity” means a consumer, Generation Licensee, <u>Import Licensee</u> , Wholesaler Licensee (Generation) or any other person responsible for the flow of electricity measured by a meter at which the transmission system is terminated at the associated installation, and shall include the Transmission Licensee or any person through whose plant or equipment there is a flow of electricity that is being metered for the purposes of settlement by an electricity licensee;	To update the reference to Wholesaler Licensees (following the Wholesaler Licence Modification Final Determination Paper issued on 29 Jun 2021) and to extend the definition for metered entity to include Import Licensee.
MC/2021/12	1.4.1	New definition	<u>“Transmission Licensee” has the same meaning as in the Act;</u>	To provide clarity on the respective Licensees who are required to comply with this Code as a condition of its electricity licence.

Energy Market Authority of Singapore

Modification Ref. No.	Clause	Original text	Modified text or addition	Reason for modification or addition
MC/2021/13	1.4.1	“Wholesaler Licensee (Generation)” means a person who is authorised by an electricity licence to trade in any wholesale electricity market operated by the Market Company for the purpose of selling electricity;	<p>“Wholesaler Licensee (Generation)” means a person who is authorised by an electricity licence to trade in any wholesale electricity market operated by the Market Company for the purpose of selling electricity;</p> <p><u>(i) selling electricity generated by the Licensee under the exemption set out in the Electricity (Electricity Generation Licence) (Exemption) (No. 2) Order; and/or</u></p> <p><u>(ii) providing ancillary services or any electricity-related product or service through a load reduction;</u></p>	To update the reference to Wholesaler Licensees (following the Wholesaler Licence Modification Final Determination Paper issued on 29 Jun 2021).
MC/2021/14	2.1.1	Subject to section 2.4.7, for those meter installations associated with a generation facility, the Generation Licensee or Wholesaler Licensee (Generation) that owns the generation facility shall be the MESP.	Subject to section 2.4.7, for those meter installations associated with a generation facility, the Generation Licensee or Wholesaler Licensee (Generation) that owns the generation facility shall be the MESP.	To update the reference to Wholesaler Licensees (following the Wholesaler Licence Modification Final Determination Paper issued on 29 Jun 2021).
MC/2021/15	2.1.3	New Clause	<u>For those meter installations associated with an <i>import facility</i>, the owner of the <i>import facility</i> shall be the MESP.</u>	To include owner of the import facility as the Meter Equipment Service Provider (MESP) for meter installation associated with an import facility.

Energy Market Authority of Singapore

Modification Ref. No.	Clause	Original text	Modified text or addition	Reason for modification or addition
MC/2021/16	2.2.3	Wholesaler Licensee (Generation) with embedded generation facility may engage the Transmission Licensee to provide, install, commission, maintain, repair, replace, inspect and test each meter installation. The Wholesaler Licensee (Generation) shall pay the relevant charges based on the metering services provided.	Wholesaler Licensee (Generation) with embedded generation facility may engage the Transmission Licensee to provide, install, commission, maintain, repair, replace, inspect and test each meter installation. The Wholesaler Licensee (Generation) shall pay the relevant charges based on the metering services provided.	To update the reference to Wholesaler Licensees (following the Wholesaler Licence Modification Final Determination Paper issued on 29 Jun 2021).
MC/2021/17	2.4.10	Except in relation to an embedded generation facility, the main and check meters for a GF shall be a 3-phase, 4-wire type or 3-phase, 3-wire type of accuracy class 0.2s. Metering current transformers of accuracy class 0.2 with 1 or 5 amperes secondary current and 30VA burden shall be provided for each circuit. Metering voltage transformers shall be of accuracy class 0.5 with 110 volts secondary voltage and a burden of not less than 100VA per phase per circuit.	Except in relation to an embedded generation facility, the main and check meters for a GF <u>with total generation capacity above 10MW or solar photovoltaic (PV) facilities of capacity above 10MWac</u> , shall be a 3-phase, 4-wire type or 3-phase, 3-wire type of accuracy class 0.2s. Metering current transformers of accuracy class 0.2 with 1 or 5 amperes secondary current and 30VA burden shall be provided for each circuit. Metering voltage transformers shall be of accuracy class 0.5 with 110 volts secondary voltage and a burden of not less than 100VA per phase per circuit.	To differentiate the metering requirements for generation facilities ("GF"). The more stringent metering requirements under section 2.4.10 are intended for large generating facility namely those of capacity above 10MW or solar photovoltaic (PV) facilities of capacity above 10MWac. This is necessary given their large generation capacity, as any under or over generation due to inaccurate meter readings will have to be smeared to all consumers as higher/lower transmission system losses and this will not be equitable for consumers.

Energy Market Authority of Singapore

Modification Ref. No.	Clause	Original text	Modified text or addition	Reason for modification or addition
MC/2021/18	2.4.11	New clause	<p><u>Except in relation to an embedded generation facility, the main and check meters for a GF connected to the distribution network at 22kV or 6.6kV and with generation capacity 10MW and below or solar photovoltaic (PV) facilities of capacity 10MWac and below, shall be a 3-phase, 4-wire type or 3-phase, 3-wire type of accuracy class 0.5. Metering current transformers of accuracy class 0.5 with 1 or 5 amperes secondary current and 30VA burden shall be provided for each circuit. Metering voltage transformers shall be of accuracy class 1.0 with 110 volts secondary voltage and a burden of not less than 100VA per phase per circuit.</u></p>	<p>To relax the metering requirements for GF with total generation capacity 10MW and below or solar photovoltaic (PV) facilities of capacity 10MWac and below. Given their relatively small generation capacity, they are not required to comply with the more stringent metering requirements under section 2.4.10. Instead, they shall comply with the same metering accuracy class and burden requirements as that of high voltage installations as stated under section 2.4.25 of the Metering Code and as shown in the proposed clause 2.4.11</p>

Energy Market Authority of Singapore

Modification Ref. No.	Clause	Original text	Modified text or addition	Reason for modification or addition
MC/2021/19	2.4.12	New clause	<p><u>Except in relation to an embedded generation facility, the main and check meters for a GF connected to the low voltage network shall be either 1-phase, 2-wire or 3-phase, 4-wire type of accuracy class 2.0 and metering current transformers, of accuracy class 0.5 with 5 amperes secondary current and a burden of not less than 5VA.</u></p>	<p>To relax the metering requirements for GF with generation capacity connected to the distribution low voltage network. Given their small generation capacity, they are not required to comply with the more stringent metering requirements under section 2.4.10. Instead, they shall comply with the same metering accuracy class and burden requirements as that of low voltage installations as stated under section 2.4.30 of the Metering Code and as shown in the proposed clause 2.4.12.</p>
MC/2021/20	2.4.14	2.4.14 Section 2.4.8 to 2.4.10 and 2.4.12 do not apply to intermittent embedded generation facilities on Solar Generation Profiling.	2.4.14 6 Section 2.4.8 to <u>2.4.12</u> and <u>2.4.14</u> do not apply to intermittent embedded generation facilities on Solar Generation Profiling.	<p>Given the proposed introduction of new clauses 2.4.11 and 2.4.12, the current section 2.4.14 has to be renumbered to 2.4.16.</p>

Energy Market Authority of Singapore

Modification Ref. No.	Clause	Original text	Modified text or addition	Reason for modification or addition
MC/2021/21	4.6.7(i)	<p>A Generation Licensee or a Wholesaler Licensee (Generation) for a generation meter. The Generation Licensee or a Wholesaler Licensee (Generation) may use any means it deems appropriate, but in any case will provide justification for the approach adopted, along with supporting evidence to justify their estimation for each occasion an estimate is requested. Such information shall be recorded by the MDM and made available to the Authority or surveillance panel at their request, to support an investigation into inappropriate behaviour.</p>	<p>A Generation Licensee or a Wholesaler Licensee (Generation) for a generation meter. The Generation Licensee or a Wholesaler Licensee (Generation) may use any means it deems appropriate, but in any case will provide justification for the approach adopted, along with supporting evidence to justify their estimation for each occasion an estimate is requested. Such information shall be recorded by the MDM and made available to the Authority or surveillance panel at their request, to support an investigation into inappropriate behaviour.</p>	<p>To update the reference to Wholesaler Licensees (following the Wholesaler Licence Modification Final Determination Paper issued on 29 Jun 2021).</p>

FORMAT FOR SUBMISSION OF COMMENTS AND FEEDBACK

PROPOSED MODIFICATION TO THE METERING CODE

S/N No.	Modification Ref. No.	Industry Comments

Comments/Feedback submitted by

Name :
Designation :
Company :
Email :
Tel. No. :