



CONSULTATION PAPER FOR PROPOSED MODIFICATIONS TO THE TRANSMISSION CODE

Closing date for submission of representations:
01 Jul 2026, 5 p.m.

03 JUN 2026 | ENERGY MARKET AUTHORITY
1 Pasir Panjang Road,
#23-01, Labrador Tower,
Singapore 118479
www.ema.gov.sg

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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 Transmission Code sets out the rights and obligations of the Transmission Licensee, together with the rights and obligations of users of the Transmission System. The Transmission Code also sets out the technical requirements to be met by those who seek to connect and operate installations on the Transmission System.

2 Proposed Modifications to the Transmission Code

- 2.1. Pursuant to Section 1.6 of the Transmission Code, EMA seeks representations on the proposed modifications to the Transmission Code as set out in Appendix 1.
- 2.2. The proposed modifications are to provide updates and clarity on the technical requirements relating to domestic solar PV generation facilities, i.e. Solar PV generation facilities that is installed in Singapore. These proposed modifications do not preclude EMA from introducing requirements or mechanisms for domestic solar PV generation facilities relating to intermittency management such as energy storage systems, at a later stage, taking into account technological developments and power system needs.

3 Invitation to submit representations

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

EMA_ES@ema.gov.sg

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

*Electricity System Department
Energy Infrastructure Division
Energy Market Authority
1 Pasir Panjang Road, #23-01
Labrador Tower, Singapore 118479*

Please use the form set out in Appendix 2 for your representations.

- 3.3. Anonymous representations will not be considered.
- 3.4. All representations must be in writing and must reach EMA by 5 pm on 01 Jul 2026.

- 3.5. EMA will acknowledge receipt of all submitted representations electronically. EMA reserves the right to make public all or any part of any 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.
- 3.6. This Consultation Paper shall constitute notice of the proposed modifications to the Transmission Code set out in Appendix 1, for the purpose of Section 1.6 of the Transmission Code.

~ End ~

Appendix 1

Table 1: Proposed Modifications to the Transmission Code

Modification Ref. No.	Clause	Original Text	Modified Text	Reasons
TC/2026/20	4.2.3	The Transmission Licensee shall forward the proposed connection scheme (where the proposed connection is to the <i>transmission network</i> , or is for the connection of <i>generating unit(s)</i> of rated capacity 1MW and above or solar photovoltaic <i>generating unit(s)</i> of capacity 1MWac and above to the consumer's <i>installation</i> that is connected to the <i>transmission network</i>) to the <i>Power System Operator</i> . The <i>Power System Operator</i> , upon receiving the proposed connection scheme from the Transmission Licensee:-	The Transmission Licensee shall forward the proposed connection scheme (where the proposed connection is to the <i>transmission network</i> , or is for the connection of <i>generating unit(s)</i> of rated capacity 1MW and above or domestic solar photovoltaic <i>generating unit(s)</i> of <u>aggregated</u> capacity 1MWac and above to the consumer's <i>installation</i> that is connected to the <i>transmission network</i>) to the <i>Power System Operator</i> . The <i>Power System Operator</i> , upon receiving the proposed connection scheme from the Transmission Licensee:-	This amendment clarifies that 1MWac capacity threshold applies to the aggregated capacity of domestic solar photovoltaic generating units connected to a consumer's installation on the transmission network.
TC/2026/21	6.6.1	6.6 Reactive Power Requirements 6.6.1 The Generation Licensee responsible for each generating unit connected to the transmission system shall ensure that each generating unit has the capability of operating at a power factor from 0.95 leading to 0.85 lagging as measured at the terminals of the generating unit prior to the step-up transformer. For grid-connected solar photovoltaic generating unit(s), the connected person shall ensure that the inverter(s) has the capability of operating at a power factor from 0.9 leading to 0.9 lagging.	6.6 Reactive Power Requirements 6.6.1 The Generation Licensee responsible for each generating unit connected to the transmission system shall ensure that each generating unit has the capability of operating at a power factor from 0.95 leading to 0.85 lagging as measured at the terminals of the generating unit prior to the step-up transformer. For grid-connected domestic solar photovoltaic generating unit(s), the connected person shall ensure that the <u>photovoltaic generating unit(s)' inverter(s) shall be of grid-forming type inverter which</u> has the capability of operating at a power factor from 0.9 leading to 0.9 lagging.	This amendment is to update that each new installed domestic Solar photovoltaic generating unit shall be installed with a grid-forming type inverter to support the grid.
TC/2026/22	C4.1	All <i>generating units</i> of gross generating capacity exceeding 10MW or registered with the Energy Market Company as a <i>generation registered facility</i> shall be centrally dispatched. All centrally dispatchable <i>generating units</i> , shall be designed to have the following capabilities except where the Generation Licensees declare with technical justifications that certain capabilities are technically not possible and	All <i>generating units</i> of gross generating capacity exceeding 10MW or registered with the Energy Market Company as a <i>generation registered facility</i> shall be centrally dispatched. All centrally dispatchable <i>generating units</i> , shall be designed to have the following capabilities except where the Generation Licensees declare with technical justifications that certain capabilities are technically not possible and submit such request together with its supporting	This amendment clarifies that sub-clauses C4.1(a), (c), (d), (e) and (f) do not apply to domestic solar PV generation facilities, which are intermittent generation facilities.

Modification Ref. No.	Clause	Original Text	Modified Text	Reasons
		submit such request together with its supporting reasons for PSO consideration.	reasons for PSO consideration. <u>For domestic Solar PV generation facilities, C4.1(a), (c), (d), (e) and (f) are not applicable.</u>	
TC/2026/23	F7.1	This section states the minimum spinning reserve requirement in terms of primary reserve for each generating unit which has a Completion Date after 1 January 2000.	This section states the minimum spinning <i>reserve</i> requirement in terms of primary <i>reserve</i> for each <i>generating unit</i> which has a Completion Date after 1 January 2000, <u>except domestic solar PV generation facilities.</u>	This amendment clarifies that the Primary Reserve Requirement does not apply to domestic solar PV generation facilities. EMA reserves the right to introduce separate mechanisms where needed.
TC/2026/24	F8.1	Each <i>generating unit</i> must be capable of providing minimum primary <i>reserve</i> for both primary and <i>alternate fuel</i> . The Spinning Reserve Requirements for primary and <i>alternate fuel</i> are as follows:	Each <i>generating unit</i> , <u>except domestic solar PV generation facilities</u> , must be capable of providing minimum primary <i>reserve</i> for both primary and <i>alternate fuel</i> . The Spinning Reserve Requirements for primary and <i>alternate fuel</i> are as follows:	This amendment clarifies that the Spinning Reserve Requirements for Frequency Sensitive Plant do not apply to domestic solar PV generation facilities. EMA reserves the right to introduce separate mechanisms where needed.
TC/2026/25	C4.1(i)	(i) Remote Monitoring and Automatic Generation Control The Generation Licensee shall make provision at their facility for remote monitoring of the <i>generating units'</i> output and switchhouse equipment loading and operating conditions etc. as well as automatic control of generation output from <i>Power System Operator's EMS</i> .	(i) Remote Monitoring and Automatic Generation Control The Generation Licensee shall make provision at their facility for remote monitoring of the <i>generating units'</i> output and switchhouse equipment loading and operating conditions etc. as well as automatic control of generation output from <i>Power System Operator's EMS</i> . <u>Notwithstanding the above, a domestic solar PV generation facility need not provide automatic generation control capabilities but shall still provide Remote Terminal Unit(s) for remote monitoring of their domestic solar PV generating unit's output and operating conditions.</u>	The requirement for Automatic Generation Control shall not be applicable to domestic solar PV generating units.

Modification Ref. No.	Clause	Original Text	Modified Text	Reasons
TC/2026/26	H1.1	H1.1 All generation facilities and transmission network that are required to interface to the <i>Energy Management System (EMS)</i> of the <i>PSO</i> shall provide several or all of the following functions: (a) SCADA functions (b) Automatic Generation Control (AGC) functions	H1.1 All generation facilities and transmission network that are required to interface to the <i>Energy Management System (EMS)</i> of the <i>PSO</i> shall provide several or all of the following functions: (a) SCADA functions (b) Automatic Generation Control (AGC) functions. <u>Notwithstanding the above, a domestic solar PV generation facility need not provide automatic control capabilities but shall still provide SCADA functions for remote monitoring of their domestic solar PV generating unit's output and operating conditions.</u>	The requirement for Automatic Generation Control should not be applicable to domestic solar PV <i>generating units</i> .
TC/2026/27	H2.1 (b)	(b) A <i>generating station</i> shall have a dedicated <i>RTU</i> with the condition that the <i>RTU</i> shall not be controlling more than 4 <i>generating units</i> or a total of more than 1000MW. Should the number of <i>generating units</i> or total generating capacity exceed this, then a second <i>RTU</i> shall be provided.	(b) A <i>generating station</i> shall have dedicated <i>RTUs</i> with the condition that the each <i>RTU</i> shall not be controlling more than 4 <u>centrally dispatchable generating units</u> or total generation capacity of a total of more than 1000MW. Should the number of generating units or total generating capacity exceed this, then a second RTU shall be provided.	As the requirement for an additional RTU for monitoring are meant for large generating units and if the aggregated generation capacity of (more than 4) distributed energy resources is less than 1000MW, a momentary loss of monitoring of these distributed energy resources will not have a significant impact to power system operations. As such there is no foreseeable need for the licensee to provide an additional RTU for monitoring purposes if they are not more than 4 centrally dispatchable generating units.

Modification Ref. No.	Clause	Original Text	Modified Text	Reasons
TC/2026/28	H4.2	Generating station H4.2.1 The status of the following equipment shall be provided: (a) <i>Generating unit circuit breakers;</i> (b) Local/Remote status; (c) Load limiter status; (d) Status of frequency response switch; (e) Emergency Shutdown Valve (ESDV) and the status of all valves on the Onshore Receiving Facility (ORF) and natural gas transmission pipeline supplying natural gas to the generation facility; (f) Pressure and gas flow at ORF and natural gas transmission pipeline supplying natural gas to the generation facility; (g) For a combined-cycle plant or gas turbine, the ambient temperature and the hot switch activation signal when fuel changeover is initiated, manually or automatically, from natural gas to its alternate fuel and the fuel type used; and (h) Other quantities, as required. H4.2.2 The following measurements shall be provided: (a) MW and MVar of all <i>generating units</i>; (b) Unit terminal voltage of all <i>generating units</i>; (c) High/Low Limits of load limiter; (d) Frequency at <i>generating unit</i> terminal; and (e) Other quantities, as required; H4.2.3 The following remote control facilities shall be provided: (a) <i>Generating unit</i> raise or lower control; and (b) Other equipment, as required;	Generating station H4.2.1 The status of the following equipment shall be provided: (a) <i>Generating unit circuit breakers;</i> (b) Local/Remote status; (c) Load limiter status; (d) Status of frequency response switch; (e) Emergency Shutdown Valve (ESDV) and the status of all valves on the Onshore Receiving Facility (ORF) and natural gas transmission pipeline supplying natural gas to the generation facility; (f) Pressure and gas flow at ORF and natural gas transmission pipeline supplying natural gas to the generation facility; (g) For a combined-cycle plant or gas turbine, the ambient temperature and the hot switch activation signal when fuel changeover is initiated, manually or automatically, from natural gas to its alternate fuel and the fuel type used; and (h) Other quantities, as required. H4.2.2 The following measurements shall be provided: (a) MW and MVar of all <i>generating units</i>; (b) Unit terminal voltage of all <i>generating units</i>; (c) High/Low Limits of load limiter; (d) Frequency at <i>generating unit</i> terminal; and (e) Other quantities, as required; H4.2.3 The following remote control facilities shall be provided: (a) <i>Generating unit</i> raise or lower control; and (b) Other equipment, as required; <u>Notwithstanding the above domestic solar PV generation facility need not provide information in</u>	To exclude the requirements for a generation facility where generation comprise solely domestic solar PV generating units.

Modification Ref. No.	Clause	Original Text	Modified Text	Reasons
			<u>Clauses H4.2.1 (b), (c), (d), (e), (f), (g), H4.2.2 (c) and H4.2.3 (a).</u>	
TC/2026/29	H4.3	H4.3 Solar Photovoltaic System The following measurements shall be provided: (a) Active Power (gross) at the AC-side of the solar photovoltaic system; and (b) Solar irradiance from sensor installed in close proximity to the PV panels. The solar irradiance sensor shall comply with the following minimum specifications: • Irradiance range: 0 – 2000Wm⁻² or better • Accuracy of direct power output: >90% for clear sky • Directional response (for beam irradiance): +/- 20Wm² • Response time to reach 95% response: <30 seconds	H4.3 Solar Photovoltaic System The following measurements shall be provided: (a) Active Power (gross) <u>and Reactive Power</u> at the AC-side of the <u>domestic</u> solar photovoltaic system; and (b) Solar irradiance from sensor installed in close proximity to the PV panels. The solar irradiance sensor shall comply with the following minimum specifications: • Irradiance range: 0 – 2000Wm⁻² or better • Accuracy of direct power output: >90% for clear sky • Directional response (for beam irradiance): +/- 20Wm² • Response time to reach 95% response: <30 seconds	This amendment is to update the monitoring requirements for each domestic Solar PV system.

Appendix 2

Representations on the Proposed Modifications to the Transmission Code

Name: _____

Designation: _____

Company: _____

Email: _____

Role (Generation Licensee/ Retailer/ Consumer):

Submission Date: _____ (dd/mm/yy)

Modification Ref. No.	Section	Comments