National Electricity Market of Singapore

PUBLIC CONSULTATION ON RE-EVALUATION AND MODIFICATION OF CATALOGUE OF MONITORING INDICES

As required under section 4.3.2 of Chapter 3 of the Singapore Electricity Market Rules ("Market Rules"), the Catalogue of Monitoring Indices was developed by the Market Assessment Unit ("MAU"), under the supervision and direction of the Market Surveillance and Compliance Panel ("MSCP"). The Catalogue of Monitoring Indices is used by the MSCP/MAU to evaluate the data acquired pursuant to the Catalogue of Data.

The Catalogue of Monitoring Indices was adopted by the MSCP and made effective since 29 July 2004, after considering public comments received through consultation with market participants, service providers and all other interested parties in accordance with section 4.3.3 of Chapter 3 of the Market Rules.

Pursuant to section 4.3.6 of Chapter 3 of the Market Rules, the MSCP/MAU has re-evaluated and modified the existing Catalogue of Monitoring Indices to reflect the developments in the National Electricity Market of Singapore ("NEMS"). The proposed updated Catalogue of Monitoring Indices is enclosed in this paper.

Market participants, the market support services licensee, the Power System Operator ("PSO"), Energy Market Company Pte Ltd ("EMC"), and other interested parties are invited to provide comments on the proposed updated Catalogue of Monitoring Indices to the MSCP by 4 May 2020:

Market Surveillance and Compliance Panel
c/o Market Assessment Unit
E-mail: mau@emcsg.com

13 April 2020

Proposed Updated Catalogue of Monitoring Indices
National Electricity Market of Singapore

Type of Indices	No.	Description	MSCP/MAU's Comments
Supply	1.	Capacity ratio of a generation registered facility – Ratio of a generation registered facility's (a) scheduled generation output to (b) maximum generation capacity	No change.
	2.	Supply cushion – Ratio of (a) the difference between total offered volume and system demand to (b) total offered volume	No change.
	3.	Outage frequency	No change.
	4.	Market share by: (a) generation type; (b) generation licensee; and (c) generation registered facility and corresponding Herfindahl-Hirschman Index ("HHI")	The market share index is useful in assessing whether the market design facilitates the efficient and fair operation of a competitive market. We propose to include market share by generation type to reflect the existing practice in our annual reporting. We also propose to include additional structural indicators focusing on the supply side. A firm typically possesses structural market power if that market is concentrated, i.e. a few firms, or if one firm has a large market share. One of the market concentration measurements we have noticed commonly used in other jurisdictions is the HHI. HHI is calculated by summing the square of each market participant's market share. As a rule of thumb, a higher HHI indicates a less competitive market.[1]
	5.	Percentage of time output when there were: (a) at least 1 pivotal supplier; (b) 1 pivotal supplier; (c) 2 pivotal suppliers; and (d) 3 pivotal suppliers	This is a new proposed monitoring index. We recognise that concentration metrices such as the HHI is a good measure to determine the level of competitiveness on a system-wide basis. However, the HHI could be in some instances a simple measure that could fail to take into account the complexities of various markets. Therefore, it is also critical

[1] A market with an HHI of less than 1,500 is considered to be a competitive marketplace, an HHI of 1,500 to 2,500 to be a moderately concentrated marketplace, and an HHI of 2,500 or greater to be a highly concentrated marketplace.

Type of Indices	No.	Description	MSCP/MAU's Comments
			to measure whether a firm can be pivotal, i.e. whether its capacity is necessary to meet market demand, to assess whether the firm can influence prices. Based on our assessment of the other jurisdictions, we note that pivotal supplier tests are often used in measuring market power in the United States. These tests evaluate whether there are any firms required to meet the demand in the market. A supplier is deemed to be pivotal if the combined capacity of all its competitors is not sufficient to meet total demand. We propose to include the pivotal supplier test as an additional measurement on the extent to which one or more participants is pivotal to clearing the market.
	6.	Trend of price setting generating units	This is a new proposed monitoring index related to the offer behaviour of the generating units. A generator is a price setter when it is offering the marginal unit in the market. Being a price setter may be indicative of its stronger incentive and ability to exercise market power, given that it has the potential to directly influence the price it receives.
	7.	Comparison of metered generation quantity with scheduled dispatch quantity by generation registered facility/generation licensee	No change.
	8.	Frequency of issuance by PSO of dispatch instructions deviating from real-time dispatch schedule	No change.
	9.	Frequency of offer/bid variations or revisions to standing offers/bids exceeding offer/bid change limits	This is an update to reflect bid submissions arising from the demand response programme introduced in the NEMS in 2016.
	10.	Reasons and timings for the change in offer/bid variations exceeding offer change limits	This is a new proposed monitoring index to analyse the offer/bid behaviour of market participants. Since market start to 2019, there have been a total of 37,118 offer variations submitted after gate closure. While the annual

<table>
<tr><th>Type of Indices</th><th>No.</th><th>Description</th><th>MSCP/MAU's Comments</th></tr>
<tr><td></td><td></td><td></td><td>statistics have been on a downward trend, there has been an increase in the number of rule breach determinations made against market participants for failing to comply with the gate closure rules in recent years:

<table><tr><th>Year</th><th>Number of cases</th></tr><tr><td>2005</td><td>2 cases</td></tr><tr><td>2009</td><td>1 case</td></tr><tr><td>2012</td><td>1 case</td></tr><tr><td>2013</td><td>1 case</td></tr><tr><td>2016</td><td>2 cases</td></tr><tr><td>2017</td><td>2 cases</td></tr><tr><td>2018</td><td>3 cases</td></tr></table>
Generators/loads typically re-offer into the system after experiencing equipment technical fault or in response to changes in market conditions. Re-offers become a problem when changes to the offers are made without a legitimate justification or when they are made only at the last possible moment when it knows in advance that it intends to re-offer. Such actions are likely to cause wholesale prices to spike.</td></tr>
<tr><td></td><td>11.</td><td>Frequency of demand response activation and analysis of energy bids</td><td>This is a new proposed monitoring index to include the demand response programme that was introduced in the NEMS in 2016.

Demand response enables consumers to reduce their electricity demand voluntarily, in exchange for a share in the system-wide benefits, in terms of reduction in wholesale energy prices as a result of their actions. Such reductions in electricity consumption typically take place when wholesale electricity prices are high or when generation supply is tight.</td></tr>
<tr><td rowspan="2">Demand</td><td>12.</td><td>Comparison of latest available very short-term load forecast with real-time load forecast</td><td>No change.</td></tr>
<tr><td>13.</td><td>Comparison of real-time load forecast with metered generation quantity</td><td>No change.</td></tr>
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Type of Indices	No.	Description	MSCP/MAU's Comments
Price	14.	Trend of Uniform Singapore Energy Price ("USEP"), reserve prices, regulation price and comparison of trends	No change.
	15.	Percentage of hours and quantity of load when WEP[2] falls into a particular price range	No change.
	16.	Correlation between WEP and system demand	No change.
	17.	Correlation between WEP and fuel price	No change.
	18.	Comparison of latest available short-term schedule projected prices with real-time prices	No change.

Note: The proposed modifications above are based on a benchmarking examination of the monitoring practices of other electricity markets that were previously considered in the Catalogue of Monitoring Indices dated 29 July 2004, namely: Ontario Wholesale Electricity Market; National Electricity Market of Australia; electricity market operated by the Alberta Power Pool; electricity market operated by the New York Independent System Operator, Inc; electricity market operated by the ISO New England Inc; and electricity market operated by the PJM Interconnection, LLC.

[2] The Wholesale Electricity Price ("WEP") comprises of the USEP, the Allocated Regulation Price ("AFP"), Hourly Energy Uplift Charge ("HEUC"), Monthly Energy Uplift Charge ("MEUC"), EMC administrative costs and PSO administrative costs.

Annex 1: Template for Submission of Comments

PART I – GENERAL INFORMATION OF PARTY COMPLETING THIS DOCUMENT		
Name *(where this document is completed on behalf of an organisation, please state the name of the organization)*		
Address		
Tel No.		
Fax No.		
Email Address		
Representatives *(where this document is completed on behalf of an organisation, please furnish the particulars of 2 representatives whom we may liaise with on this matter)*	**Representative 1**	**Representative 2**
Name		
Designation		
Tel No. *(if different from above)*		
Fax No. *(if different from above)*		
Email Address *(if different from above)*		

PART 2 – SUBMISSION OF COMMENTS		
	Reference to Item No.	**Comments**
1.		
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