CEO’s Message

EMC hosted the 12th Singapore Electricity Roundtable on 30 July. We received more than 210 guests from Singapore and the region, and I am very pleased with the lively discussions and debates around the Roundtable topics this year.

I would like to convey my sincere appreciation to our esteemed speakers and all attendees for their participation and support, without which the event would not have been such a great success.

Looking at developments in the National Electricity Market of Singapore (NEMS) in the last two months: Five new intermittent generation source facilities were registered in July and August, and two new rule changes came into effect in August. Price-wise, after falling below $100/MWh in the last three months, the Uniform Singapore Energy Price (USEP) rebounded in July to $112.72/MWh, the third highest level so far this year, before retreating again in August.

Finally, we were privileged to welcome His Excellency (H.E.) Dr Rashid Alleem, Chairman of the Sharjah Electricity and Water Authority (SEWA), in July to commemorate our partnership with SEWA by participating in the SGX Daily Securities Market Opening. EMC is committed to promoting the development of competitive energy markets and in this regard, we look forward to greater collaboration with SEWA.

Looking ahead, the next major event on our calendar is the EMC Golf Day which will be held in September. I look forward to welcoming our market participants and partners once again at this industry networking event.

Toh Seong Wah
Chief Executive Officer
Highlights of Singapore Electricity Roundtable 2019

The 12th Singapore Electricity Roundtable was held on 30 July at The Fullerton Hotel, Singapore. This year, we welcomed more than 210 participants from Singapore and the region.

The event this year saw robust discussions on trends and issues that are impacting power markets around the world, such as the rapid rise and penetration of renewable energy, and digitalisation in the energy sector. There were also updates on developments in the National Electricity Market of Singapore (NEMS), as well as discussions on the challenges and opportunities facing Singapore’s power sector.

We were honoured to have the Chief Executive of Energy Market Authority – Ngiam Shih Chun – as one of our distinguished speakers this year. We were also grateful to the following esteemed speakers who shared invaluable perspectives from their experience in established electricity markets in Australia, the United Kingdom, the United States of America and Singapore – Ben Skinner, General Manager for Policy and Research, Australian Energy Council; Damien Sanford, Chief Operations Officer, Australian Energy Market Operator; Phillip Harris, Consultant and Former President/CEO, PJM Interconnection; Stephen Woodhouse, Director, Pöyry Management Consulting; and Poa Tiong Siaw, EMC’s Senior Vice President for Market Administration.

To improve the participants’ experience and further reduce our carbon footprint for the event, we introduced an event application this year to replace hardcopy conference materials. We also purchased carbon credits to offset the indirect carbon emissions arising from sources like energy consumed during the event, waste generated, international travel by air and local transportation.

The Roundtable ended with an exclusive networking cocktail and dinner at Monti at the Fullerton Pavilion.

We would like to thank all participants for making the Singapore Electricity Roundtable 2019 a great success. We look forward to welcoming both returning and new participants at the next Roundtable in 2021.
On 31 July, EMC and Sharjah Electricity and Water Authority (SEWA) struck the SGX Daily Securities Market Opening gong – which officiates the start of the securities trading day – to commemorate our partnership with SEWA as it embarks on the journey to develop Sharjah's electricity market.

We were extremely privileged to welcome His Excellency (H.E.) Dr Rashid Alleem, Chairman of SEWA, and H.E. Mr Zainul Abidin Rasheed, Singapore's Ambassador to Kuwait and the Foreign Minister's Special Envoy to the Middle East, at the event. We would also like to thank Mr Mohamed Alfalahi, Chargé d'Affaires (a.i.), Embassy of the United Arab Emirates in Singapore, and Mr Shaikh Saleh Al Sharqi, Second Secretary, Embassy of the United Arab Emirates in Singapore, for gracing the occasion.

We look forward to more collaborations between the two organisations, and to supporting SEWA with the experience that we have gained from Singapore's electricity market.

On 22 July, we hosted 14 delegates from the Electricity Regulatory Authority of Vietnam (ERAV) and the Vietnam Electricity Corporation (EVN) who were on a two-day visit to Singapore to understand our electricity market liberalisation journey.

Aside from EMC, the delegates also visited an electricity retailer as well as the Energy Market Authority. We are glad to share our knowledge and experience of operating Singapore's wholesale electricity market, and look forward to collaboration opportunities with the ERAV and the EVN in the near future.
EMC’s Non-Financial Performance Results for FY2018/2019

We are proud to share the excellent results achieved by the EMC team for our key performance measures for FY2018/2019.

Energy Market Authority (EMA) Performance Standards

EMC has exceeded all performance targets set by the EMA for the fourth consecutive year since these targets were introduced. The outstanding performance can be attributed to the team’s sustained efforts in enforcing high standards and quality in our critical processes.

<table>
<thead>
<tr>
<th>Service Dimension</th>
<th>Service Indicator</th>
<th>For the Period 1 Jul 2018 to 30 Jun 2019</th>
<th>Performance Target</th>
<th>Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems Availability</td>
<td>Percentage of availability of EMC’s systems including (i) trading website; (ii) clearing systems; and (iii) settlement system.</td>
<td>99.90%</td>
<td>99.99%</td>
<td></td>
</tr>
<tr>
<td>Pricing Accuracy</td>
<td>Percentage of all trading days free of incidents caused by EMC error*.</td>
<td>99.90%</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td>Settlement Accuracy</td>
<td>Percentage of all settlement payments free of EMC error*.</td>
<td>80.00%</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td>Customer Responsiveness</td>
<td>Percentage of all market participants’ issues lodged with EMC Helpdesk to be resolved within 6 business days.</td>
<td>100.00%</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Percentage of all market participants’ issues lodged with EMC Helpdesk to be resolved within 10 business days.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Excludes inaccurate data provided by other service providers or market participants in the NEMS, and trading days when the system is unavailable.

EMC Customer Satisfaction Survey

Separately, EMC conducts an annual Customer Satisfaction Survey to gather feedback from the key stakeholders of the National Electricity Market of Singapore (NEMS). This is a voluntary exercise that we undertake to ensure that we continue to deliver high service levels to our stakeholders.

We are encouraged by the high satisfaction ratings that we continue to receive from our stakeholders despite the challenge of managing the expectations of an increasing number and changing mix of market participants in the NEMS.

We thank all NEMS stakeholders for their continued participation in the survey. We will work towards closing the gaps where there were service lapses, while maintaining our service levels in the areas that we have done well.

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Achievement 1 Jul 2018 – 30 Jun 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction with Customer Responsiveness</td>
<td>96.61%</td>
</tr>
<tr>
<td>Satisfaction with Market Assessment and Dispute Resolution Services</td>
<td>100.00%</td>
</tr>
<tr>
<td>Satisfaction with Rule Change Services</td>
<td>96.23%</td>
</tr>
</tbody>
</table>
Rule Change Updates

Restoration of Load Registered Facilities Activated to Provide Reserve

Load registered facilities (LRFs) provide reserve through voluntary reductions of their load consumption during contingency events. This is known as interruptible load (IL) service in the Singapore Wholesale Electricity Market (SWEM).

Under the current Market Rules, LRFs are not allowed to restore their consumption after being activated to provide reserve until clearance from the Power System Operator (PSO) is received, which could take hours at times. The IL service providers were concerned over the significant operational and commercial implications to participating consumers, and proposed that LRFs should be required to reduce consumption only for the dispatch periods for which they have offered their services.

In order to address the concern, EMC proposed a rule change to stipulate a maximum interruption duration of 120 minutes for IL activation, beyond which the IL service providers would be allowed to seek compensation. This would give certainty and confidence to the IL service providers that their load would be restored within the stipulated timeline. In the event that LRFs are required to remain curtailed for a prolonged duration due to system security reasons, they would be compensated for the losses incurred.

The rule change was supported by the Rules Change Panel (RCP) in March 2019 and approved by the Energy Market Authority (EMA) thereafter. It took effect on 27 August 2019.

Gate Closure Exemptions

The SWEM has a 65-minute gate closure period, whereby changes to offers and bids for a dispatch period made within 65 minutes of the beginning of the dispatch period will be investigated by the Market Surveillance & Compliance Panel (MSCP). However, there are gate closure exemptions in place to allow registered facilities to make changes to their offers and bids in order to better reflect their physical capabilities or to contribute positively to resolve a system situation.

EMC reviewed the existing provisions for gate closures exemptions, and proposed a rule change to effect the following changes to the exemptions:

1. Expand the gate closure exemptions to allow an LRF to revise its reserve offers within gate closure to reflect its unavailability following an activation of reserve. This would prevent reserve from being scheduled from LRFs which are not physically available to provide reserve in a contingency event, which would otherwise pose a risk to system security.

2. Refine the existing gate closure exemption for a generation registered facility (GRF) that has experienced a forced outage, to reflect its revised capability following the event. Specifically, GRFs will be allowed to revise their offers after gate closure only for the first three periods following a forced outage.

3. Expand the gate closure exemptions to include two more exemptions to:
   - reflect a GRF's revised capability when it fails to synchronise; and
   - increase energy, reserve or regulation supply if this improves a shortfall situation, for which a high-risk operating state system status advisory notice is in effect.

The rule change was supported by the RCP in March 2019 and approved by the EMA thereafter. It took effect on 26 August 2019.

Review of Credit Support Requirements in Alignment with the Lead Time for Transfers during a Retailer of Last Resort Event

In the SWEM, all market participants (MPs) are required to put up credit support to cover at least 30 days of their estimated daily trading exposure with the EMC. This requirement is intended to cover an MP’s exposure in the SWEM which is 30 days on average – from the first trading day for which the MP defaults payment on, to the day that the MP is suspended from trading.

In practice, such credit support may be insufficient for the following reasons:

1. An MP’s actual number of days of exposure may be more than the average 30 days; and
2. An additional lead time of three business days is required to transfer customers to the Retailer of Last Resort (RoLR) after the defaulting retailer is suspended.

To address the insufficiency of credit support, EMC proposed a rule change to increase the credit support requirement to cover 38 days’ exposure for MPs, and 33 days’ exposure for the RoRL after the defaulting retailer is suspended.

To address the insufficiency of credit support, EMC proposed a rule change to increase the credit support requirement to cover 38 days’ exposure for MPs, and 33 days’ exposure for the RoRL after the defaulting retailer is suspended.

The rule change was supported by the RCP in July 2019 and approved by the EMA thereafter. It will come into effect on 8 January 2020.

For more details of the above rule changes, please visit EMC’s website.
Market Update

Overview of USEP and Supply Cushion – Jan to Aug 2019

The daily average Uniform Singapore Energy Price (USEP) ranged between $92.23/MWh and $162.50/MWh in July, and between $75.56/MWh and $126.23/MWh in August. The monthly average USEP was $112.72/MWh in July, but fell 17.2 percent to $93.28/MWh in August.

Compared to June, July’s USEP increased 25.5 percent due to a lower supply cushion and rising fuel oil price. July’s supply cushion fell 2.9 percent as a result of a 1.8 percent increase in demand and a 2.2 percent drop in supply, while July’s average fuel oil price increased 12.5 percent.

In August, the USEP fell as a result of a 3.1 percent increase in the supply cushion and a 13.0 percent drop in fuel oil price. August’s supply cushion increased as a result of a 4.7 percent increase in supply that outpaced a 0.5 percent increase in demand.

New Entrants to the NEMS

Five new facilities registered in the NEMS

One market participant registered five new facilities in the National Electricity Market of Singapore (NEMS) in July and August:

<table>
<thead>
<tr>
<th>Market Participant</th>
<th>Facility Type</th>
<th>Capacity (MW)</th>
<th>Date Registered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sembcorp Solar Singapore</td>
<td>Intermittent Generation Source (IGS)</td>
<td>0.600</td>
<td>17 July</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.840</td>
<td>25 July</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5.280</td>
<td>8 August</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.660</td>
<td>8 August</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.720</td>
<td>16 August</td>
</tr>
</tbody>
</table>

With these additions, coupled with capacity revisions for the other IGS facilities, the total registered capacity of IGS facilities stands at 105.738MW, or 0.8 percent of the total registered generation capacity in the NEMS.
User Forums
Market Information Sharing Forum (MISF)

The Market Operations team hosted the 106th session of the bi-monthly MISF on 11 July. During the forum, the following topics were shared with the attendees:

- Market performance and key highlights in May and June 2019;
- System enhancements and projects; and
- Feature topics:
  - Publication of offer data;
  - Island condition in pre-dispatch horizon; and
  - Regulatory load quantity incident.

We would like to thank all participants for their continuous support and strong interest in the MISF. The next MISF is scheduled on 12 September. Market participants who are interested in presenting at future MISFs are encouraged to come forward.

Market Systems User Group (MSUG)

The bi-monthly MSUG forum was held on 15 August. EMC’s Technology team updated attendees on the following topics:

- Overview of NEMS systems availability year-to-date for FY2018/2019;
- Overview of NEMS systems service desk calls received between August 2018 and July 2019;
- Overview of change releases deployed between August 2018 and July 2019;
- NEMS systems incidents;
- Disaster Recovery Preparedness Exercise;
- Status updates on Technology (infrastructure) project:
  - Managed Security Services (MSS).
- Status updates on Technology (applications) projects:
  - Validation of load forecasts;
  - Publication of offer data;
  - Server Hardware and Applications Refresh Project (SHARP);
  - Application Programming Interface (API) Gateway Management Solution;
  - Risk exposure enhancement;
  - Webservices for additional data release;
  - Review of credit support requirements to align with Retailer of Last Resort framework; and
  - Review of default levy arrangements.

The next MSUG forum is tentatively scheduled for Thursday, 17 October.

EMC Training Programme

Next course on 14 and 15 November 2019

EMC will be holding the next run of its two-day course Understanding Electricity Markets on 14 and 15 November 2019. Our staff will be conducting seven sessions covering the following topics:

- Understanding Electricity
- Why Reform and Regulation are Essential in the Electricity Industry
- The National Electricity Market of Singapore and its Unique Features
- Introduction to SGX Electricity Futures Market
- Pricing in Detail
- Market Settlement and Credit Risk Management
- How Consumers can Influence Electricity Markets

We advise you to book early to secure your place in the course date of your choice, and benefit from our early-bird discount.

Further details on the programme and on how to register are on our website, www.emcsg.com. For enquiries, please e-mail trainingprogramme@emcsg.com or contact Jan Lee at +65 6779 3000.