Market Surveillance & Compliance Panel Market Watch

Issue 60
Second Quarter (April to June 2021)
Executive Summary

The energy prices in the National Electricity Market of Singapore (“NEMS”) continued to increase in Q2 2021. The quarterly energy prices had been on an upward trend since Singapore’s first re-opening efforts in Q3 2020. Such upward movement in the energy prices in Q2 2021 could be attributed to a greater volume of unexpected generation facility outages, an increase in fuel oil price, a higher level of electricity demand, a weaker supply cushion and a higher capacity ratio of OCGT units.

Singapore encountered an increase in the number of locally transmitted Coronavirus 2019 (“Covid-19”) infection cases in Q2 2021 and decided to step back from its re-opening efforts implementing additional safe management measures from 16 May to 13 June 2021, aiming to keep the community safe and break the transmission chains, known as Phase 2 – Heightened Alert (“P2HA”).

From Q1 2021 to Q2 2021, the Uniform Singapore Energy Price (“USEP”) increased 9.02% to $99.60/MWh and the Wholesale Electricity Price (“WEP”) went up 9.28% to $99.77/MWh (refer to Chart 1). This marked the fourth consecutive increase in the quarterly energy prices since Q2 2020, when the energy prices hit a slump due to the Covid-19 pandemic. The last time when the energy prices were at similar levels was in Q3 2019 – the USEP was $100.65/MWh and the WEP was $100.96/MWh in a context of increases in the forced outage volume, the fuel oil price, the demand, and a fall in the supply cushion. These market conditions were also observed in Q2 2021.

The rise in energy prices could be brought about by a combination of the following movements in Q2 2021 when compared to the previous quarter:

- a 44.39% increase in the forced outage volume;
- an 8.24% increment in the fuel oil price\(^1\) to US$386.42/MT;
- a 5.61% growth in demand to 6,269MW;
- a 2.63 percentage point decrease in supply cushion to 21.90%; and
- a 0.01 percentage point rise in the capacity ratio of open cycle gas turbine (“OCGT”) units to 0.02%.

\(^1\) Daily average of IFO180 settlement price published by SGX Exchange Limited (“SGX”) – SGX Platts Singapore Fuel Oil 180cst Index Futures.
Following a 6.88% reduction in the vesting contract price in Q1 2021, the NEMS observed a higher vesting contract price of $151.80/MWh in Q2 2021, which translated to a quarter-on-quarter increase of 17.16% from $129.57/MWh in Q1 2021 and a year-on-year increase of 3.67% from $146.43/MWh in Q2 2020. The last time when the vesting contract price was at a similar level was in pre-pandemic Q1 2020, at $157.48/MWh. This suggests that the components of the vesting contract price were returning to the pre-pandemic levels in Q2 2021 – the Brent Index Price increased in Q2 2021 to a similar level as that in Q1 2020.

Comparing the components used in the calculation of the vesting contract price in Q1 2021 and Q2 2021, the rise in the vesting contract price in Q2 2021 could be due to the spot exchange rate, where the Singapore dollar weakened 1.33% against the US dollar\(^3\) and a 40.64% increase in the Brent Index Price.

Chart 2 shows that the WEP stayed below the vesting contract price during Q2 2020, Q1 2021 and Q2 2021. As the vesting contract price increased by a larger extent than the WEP in Q2 2021, the gap between these two prices widened during the quarter and the WEP continued to remain noticeably below the vesting contract price. The last time the WEP exceeded the vesting contract price was in Q3 2013, since the implementation of the vesting contract regime in 2004. The vesting contract regime was meant to discourage generation companies to withhold their generation capacity and exert upward pressure on the WEP, via vesting contracts which mandate a certain electricity volume (vesting contract level) to be hedged at a certain price (vesting contract price). The observation of the WEP staying consistently below the vesting contract price aligned with the Energy Market Authority (“EMA”)’s decision to phase out the vesting contract regime from 1 July 2023. The reason for the gap between these two prices over the years has been a combination of increasing generation capacity in the NEMS, a shift in generation technology from steam turbine (“ST”) units to more efficient combined cycle gas turbine (“CCGT”) units, changes in the fuel oil price and the resultant changes in generators’ offer behaviour.

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\(^2\) Pre-pandemic in this report refers to the period up to Q1 2020. Q2 2020 would be considered the Covid-19 pandemic period.

\(^3\) The spot exchange rate between the Singapore dollar and the US dollar affects the vesting contract price as some components used to determine the vesting contract price are expressed in US dollars. A weaker Singapore dollar means such components become more expensive and would have an upward effect on the vesting contract price. Conversely, a stronger Singapore dollar means those components become cheaper and would apply a downward pressure on the vesting contract price.
The distribution of the WEP over time was more concentrated in the higher price ranges in Q2 2021 than in Q2 2020 and Q1 2021 (refer to Chart 3). In Q2 2021, the WEP was above $50/MWh throughout the entire quarter, while the WEP was above $50/MWh for merely 36.93% of the time in Q2 2020 when Singapore was severely affected by the Covid-19 pandemic and 99.12% of the time in Q1 2021 when Singapore was gradually easing its safe management measures. For comparison, the WEP was above $50/MWh for 98.08% of the time in pre-pandemic Q1 2020.

Although the distribution curve in Q2 2021 was very much like that in Q1 2021, there was nevertheless a subtle shift to the right from Q1 2021 to Q2 2021, where the peak of the distribution became lower because the frequency of the WEP between $50/MWh and $100/MWh decreased from 78.91% of the time in Q1 2021 to 77.70% of the time in Q2 2021. This frequency difference was redistributed across the various price ranges above $100/MWh. In particular, the WEP did not exceed $450/MWh in Q1 2021, whereas the WEP was above $450/MWh for 0.32% of the time in Q2 2021 (14 periods), resulting in the quarterly average WEP in Q2 2021 to be higher than that in Q1 2021.

As for the distribution of the WEP in terms of total metered energy quantity in the market, it was similar to that based on total number of hours during the three quarters. The WEP was in the higher price ranges for majority of the metered energy quantity in Q2 2021 than in Q2 2020 and Q1 2021 (refer to Chart 4). In Q2 2021, all metered energy quantity was cleared with a WEP above $50/MWh, while only 39.45% of the metered energy quantity in Q2 2020 and 99.30% of that in Q1 2021 cleared with a WEP above $50/MWh.

The distribution of the WEP based on the metered energy quantity in Q2 2021 was also largely the same as the distribution in Q1 2021. Similarities aside, it is worth noting that the peak of the distribution, where the WEP was between $50/MWh and $100/MWh, slipped from 76.81% of the metered energy quantity in Q1 2021 to 76.68% in Q2 2021. This dip in metered energy quantity with a WEP between $50/MWh and $100/MWh was redistributed to the higher price ranges of $450/MWh and above in Q2 2021. It was observed that no metered energy quantity in Q1 2021 was cleared above $450/MWh, while 0.32% of the metered energy quantity in Q2 2021 was cleared above $450/MWh.

Given the rightward shift of the distribution curves from Q1 2021 to Q2 2021 in Charts 3 and 4, the WEP was observed to be in the higher price ranges over a longer duration and across a greater metered energy quantity in Q2 2021, which led to a higher WEP recorded for the quarter. The shifts in the distribution curves in Q2 2021 were recorded in a context of a greater volume of unexpected generation facility outages, an increase in fuel oil price, a higher level of electricity demand, a weaker supply cushion and a higher capacity ratio of OCGT units.
Chart 5 shows the proportion of variance in the WEP which could be explained by changes in metered energy quantity measured by $r^2$. It was observed that changes in the metered energy quantity for Q2 2021 had a muted effect on the WEP movements, as $r^2$ dropped from 0.53 in Q1 2021 to 0.07. The last time $r^2$ was at this level was during the early years of the NEMS in Q2 2006, also at 0.07. By the same token, there were fewer days in Q2 2021 where $r$ was greater than 0.5, which meant that the metered energy quantity and the WEP had a strong positive correlation over only a limited time in Q2 2021 (26 out of 91 days), compared to Q1 2021 (82 out of 90 days).

The observations from Chart 5 suggests that unlike Q1 2021, the metered energy quantity was not the key contributor to the WEP movements in Q2 2021. The $r$ value of 0.27 in Q2 2021 implies that changes in the metered energy quantity could account for 27.12% of the changes in the WEP during the quarter.

As shown in Chart 6, the fuel oil price was US$386.42/MT in Q2 2021 – not only was this price an increase of 8.24% from US$357.01/MT in Q1 2021, this was almost double the fuel oil price of US$185.69/MT in Q2 2020, when the Covid-19 pandemic took its toll on the global economy. Since the fuel oil price is an input to the cost of electricity generation, the increase in the fuel oil price led to similar changes in the WEP in Q2 2021. The WEP of $99.77/MWh was an increase of 9.28% from $91.30/MWh in Q1 2021 and almost double the WEP of $51.05/MWh in Q2 2020. The continual increment in the fuel oil price in the past two quarters reflected the resurgent global economy as some countries implemented more flexible lockdown measures with the rise in vaccination rates and the reduction in the Covid-19 infection cases.

### Table 3. Variation Between Real-Time Dispatch Price and Forecast Price

<table>
<thead>
<tr>
<th>Month/Quarter</th>
<th>Variation Between RTS and STS ($/MWh)</th>
<th>Maximum Periodic Variation ($/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 2020</td>
<td>-0.43</td>
<td>167.34</td>
</tr>
<tr>
<td>May 2020</td>
<td>0.70</td>
<td>153.72</td>
</tr>
<tr>
<td>June 2020</td>
<td>-0.20</td>
<td>92.37</td>
</tr>
<tr>
<td>January 2021</td>
<td>0.12</td>
<td>50.48</td>
</tr>
<tr>
<td>February 2021</td>
<td>1.56</td>
<td>-170.10</td>
</tr>
<tr>
<td>March 2021</td>
<td>0.64</td>
<td>223.30</td>
</tr>
<tr>
<td>April 2021</td>
<td>1.36</td>
<td>386.27</td>
</tr>
<tr>
<td>May 2021</td>
<td>0.15</td>
<td>527.18</td>
</tr>
<tr>
<td>June 2021</td>
<td>0.47</td>
<td>-139.39</td>
</tr>
<tr>
<td>Q2 2020</td>
<td>0.02</td>
<td>167.34</td>
</tr>
<tr>
<td>Q1 2021</td>
<td>0.77</td>
<td>223.30</td>
</tr>
<tr>
<td>Q2 2021</td>
<td>0.66</td>
<td>527.18</td>
</tr>
</tbody>
</table>

Table 3 shows the monthly and quarterly average variation in the USEP produced in the real-time dispatch schedule (“RTS”) and the short-term schedule (“STS”), together with the largest variation observed in a single dispatch period during each month and quarter. A positive variation means the RTS produced a higher USEP than the STS, while a negative variation means the RTS produced a lower USEP than the STS.

The forecast USEP produced in the STS in Q2 2020 was mostly mirrored the real-time USEP, at only $0.02/MWh above the real-time USEP on average. This reflects the stable USEP in Q2 2020, where there was no USEP spike (sudden increase in the USEP) observed during the quarter.

In Q2 2021, the average variation between the forecast USEP in the STS and the real-time USEP continued below a dollar per MWh and reduced further from $0.77/MWh in Q1 2021 to $0.66/MWh, implying an improved forecast accuracy from Q1 2021. Although there were more periods of USEP spikes in Q2 2021 (17 periods in Q2 2021 and one period in Q1 2021) and the largest price variation was greater in Q2 2021 ($527.18/MWh in Q2 2021 and $223.30/MWh in Q1 2021), the average price variation in Q2 2021 was smaller because the number of negative and positive variations in Q2 2021 were similar and neutralised each other. Moreover, the increase in the price variation during the USEP spikes only affected a small number of periods. Such affected periods with larger price variations were usually at the start of the USEP spikes, when the market had just experienced an abrupt change in demand or supply. As the STS became updated with the prevailing market conditions, the forecast USEP in the STS became more indicative of the real-time USEP and the price variation decreased for the other periods of USEP spikes.
Demand and Supply in Q2 2021

As observed in Chart 7, the average forecast demand went up 5.61% from 5,936MW in Q1 2021 to 6,269MW in Q2 2021, marking the fourth consecutive growth since Q3 2020, when Singapore started taking steps to recover from the impact of the Covid-19 pandemic. The increased demand in Q2 2021 also crossed the pre-pandemic level of 6,010MW observed in Q1 2020 for the first time, indicating that Singapore’s re-opening efforts had trickled down to the NEMS.

The average actual demand also went up by a similar amount, by 5.78% from 5,876MW in Q1 2021 to 6,215MW in Q2 2021.

In Q2 2021, Singapore was placed in P2HA where the safe management measures were tightened (for example, dining out was not allowed, group sizes for social gatherings and in public places were reduced and the default working arrangement was reverted to work-from-home). This was in response to the growing number of locally transmitted Covid-19 infection cases and Singapore had to put its re-opening efforts on hold for the time being. Despite such additional safe management measures applied during P2HA, the stronger demand in Q2 2021 was likely due to:

- higher peak demand recorded in Q2 2021 – the peak forecast demand increased 2.20% to 7,235MW from 7,079MW in Q1 2021 and the peak actual demand grew 2.16% to 7,252MW from 7,099MW in Q1 2021 (refer to Chart 8); and

- warmer weather in Q2 2021 – the average temperature in Singapore rose to 28.71°C from 27.86°C in Q1 2021. The demand for electricity typically goes up when the temperature rises, as more people turn on the air conditioners to withstand the hot weather.

### Table 2. Quarterly Average Supply and Supply Cushion

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Q2 2020</th>
<th>Q1 2021</th>
<th>Q2 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Supply (MW)</td>
<td>7,615</td>
<td>7,865</td>
<td>8,028</td>
</tr>
<tr>
<td>Supply Cushion (%)</td>
<td>25.00</td>
<td>24.54</td>
<td>21.90</td>
</tr>
</tbody>
</table>

Table 2 shows a 2.06% increase in the quarterly average supply from 7,865MW in Q1 2021 to 8,028MW in Q2 2021. The supply growth could be due to the generators’ behaviour, as they responded to the higher forecast demand by offering more generation to the market.

Even though the supply grew in Q2 2021, the supply cushion still weakened 2.63 percentage points from 24.54% in Q1 2021 to 21.90% in Q2 2021 as demand growth outpaced the increment in supply. Apart from a higher forced outage volume in Q2 2021 than that in Q1 2021 (refer to Table 1), there were 17 periods of USEP spike in Q2 2021, more than the one period observed in Q1 2021, indicating a higher occurrence of weak supply cushion in Q2 2021.

Chart 9 shows that the offers priced at or below $100/MWh made up a bigger proportion of the total offer quantity in Q2 2021, at 80.40% of the total offer quantity. Intuitively, a higher volume of cheaper offers should depress the WEP. However, there was also a higher volume of offers scheduled in Q2 2021 to meet the higher electricity demand. This means that offers in the higher price ranges were likely to have been scheduled as well, thus the WEP eventually rose in Q2 2021.
Chart 10. Monthly Average Variation Between Real-Time Dispatch Schedule and Forecast Load

Chart 10 shows the load variations in the pre-dispatch schedule (“PDS”) and STS compared to the RTS. The average load variations in Q2 2021 were smaller than those in Q1 2021.

Although P2HA occurred in Q2 2021, it was not the first time Singapore had experienced stricter safe management measures to curb the spread of the Covid-19. Consumers and businesses were thus more equipped to adjust to the new restrictions under P2HA and their electricity consumption did not fluctuate drastically. Hence, the variations between forecast schedules and the RTS were smaller as expected, with the real-time load being higher than the forecast loads. Additionally, it is also likely that such variations diminish over time as the market clearing engine enhances its forecasting capability by accumulating more historical data.

Q2 2021 outperformed Q1 2021 to record the smallest variation in the quarterly average load variation between the RTS and the metered energy quantity (the actual generation recorded) ever since the NEMS was established. A possible reason for the falling variation would be a progressive reduction in metering errors. As the EMA work with the SP Group to install advanced meters across Singapore and encourage households to submit their own meter readings, the meter readings become more accurate and reflective of the households’ actual electricity consumption. The number of advanced meter installations in Singapore had already exceeded 500,000 in Q2 2021, it seemed that the installation for all 1.4 million households would be on track to be completed by 2024. Therefore, the variation between the RTS and the metered energy quantity dipped further below 2% to 1.67% in Q2 2021, an improvement from 1.74% in Q1 2021 (refer to Chart 11).
In Q2 2021, the monthly average USEP and supply cushion moved in opposite directions, given that when the supply cushion weakens, the USEP is expected to increase to signal the narrowed gap between the demand and supply in the system. This shows how the changes in the electricity demand and supply had influenced the USEP during the quarter. As the monthly average supply cushion fell throughout Q2 2021 from 23.09% in April 2021 to 22.10% in May 2021 and finally 20.52% in June 2021, it indicated that the remaining supply after catering for the demand was thinning through the months. This tightening supply condition required more expensive offers to be scheduled to meet the demand and was reflected in the USEP, which rose from $97.86/MWh in April 2021 to $100.31/MWh in May 2021, and then to $100.61/MWh in June 2021.

Chart 13 shows the quarterly average capacity ratios of the four generation types in the NEMS. The movements in the capacity ratios were in line with the higher demand in Q2 2021 (refer to Chart 7), as the increased electricity demand required more electricity to be scheduled from the generation facilities.

Compared to Q2 2020, the capacity ratio of CCGT units increased 5.07 percentage points to 65.83% in Q2 2021. The capacity ratio of CCGT units had been increasing with the demand since Q3 2020. The last time the capacity ratio of CCGT units was like that in Q2 2020 was 58.63% in Q4 2016, when the demand was lower and there was an oversupply of generation capacity in the NEMS.

Compared to Q1 2021, the capacity ratio of CCGT units increased 3.42 percentage points in Q2 2021 as more electricity was scheduled from CCGT units to meet the increased demand. Conversely, the capacity ratio of other ("OT") units decreased 5.39 percentage points to 44.70% in Q2 2021 as a larger capacity of OT units was under planned maintenance and less electricity was scheduled from OT units. Following a scheduled generation in Q1 2021, the OCGT units were scheduled to generate electricity again in Q2 2021, giving rise to a quarterly average capacity ratio of 0.02% in Q2 2021. Given the costly operation of OCGT units, the scheduled generation of OCGT units in Q2 2021 was likely to have contributed to the higher WEP in Q2 2021.

4 A very small quantity was scheduled from OCGT units in Q1 2021, specifically in March 2021, resulting in a minimal capacity ratio of 0.003% (rounded off as 0.00% in Chart 13).
The breakdown of market share in the NEMS based on metered energy quantity and maximum generation capacity by generation company and generation type is shown in Charts 14 and 15 respectively.

As seen in Chart 14, the market share based on metered energy quantity shows that the three largest generation companies held 51.33% of the total market share in Q2 2021, a small concentration from 51.30% in Q1 2021. With respect to the composition of the three largest generation companies, G5 and G4 remained but G2 was replaced by G6 in Q2 2021.

The distribution of market share based on generation capacity was more concentrated – the three largest generation companies continued to hold 60.43% of the total market share in Q2 2021 (refer to Chart 15), for the fourth consecutive quarter since Q3 2020. This combined market share remained unchanged as there had been no change in the generation registered facilities. The last time when the combined market share changed was from 62.07% in Q2 2020, when a ST unit deregistered from the market.

As the NEMS moved towards the most efficient generation technology, most of the generation in the market was produced by CCGT units, as shown by an increase from 98.01% of the metered energy quantity in Q1 2021 to 98.30% in Q2 2021 in Chart 16. Given that the generation registered facilities did not change after the ST unit exited the market in Q2 2020, the market share distribution based on the maximum generation capacity also did not change since Q3 2020 and remained the same in Q1 2021 and Q2 2021 (refer to Chart 17).

Chart 16 shows that CCGT units gained a market share of 0.29 percentage point from Q1 2021 to Q2 2021 in terms of metered energy quantity as less capacity from CCGT units was placed on planned maintenance. Even though there was a higher forced outage volume from CCGT units in Q2 2021, the overall availability of CCGT units was still higher in Q2 2021 because the decrease in planned maintenance volume was more than the increase in forced outage volume. The market share of OT units shrank 0.28 percentage point in Q2 2021 because an OT unit was under planned maintenance for a longer duration in Q2 2021 than it did in Q1 2021.

As to the market share based on maximum generation capacity, the distribution in Q2 2021 remained the same because there was neither entry nor exit of any generation registered facility in the NEMS.
Chart 18. Frequency of Generation Companies as Single Pivotal Supplier

Chart 18 shows the number of dispatch periods where a single pivotal supplier is present in the NEMS for each month in Q2 2020, Q1 2021 and Q2 2021.

Based on the three quarters under review, the single pivotal supplier was rotated between three generation companies only. A single pivotal supplier would exist in approximately 10% of the total number of periods in each quarter, except in Q2 2020, when a single pivotal supplier was present in 6.71% of the total number of periods. The main single pivotal supplier switched from G4 in Q1 2021 to G5 in Q2 2021, where G5 occupied 322 out of 466 single pivotal supplier periods in Q2 2021. There was a total of 4,368 dispatch periods in Q2 2021.

Chart 19. Trend of Price Setting Generation Companies

Chart 19 shows the monthly breakdown of price setting generation companies in Q2 2020, Q1 2021 and Q2 2021.

G5 replaced G3 to become the main price setting generation company in the market in Q2 2021, as G5’s generation facilities were on planned maintenance less often in Q2 2021 than in Q1 2021. G5’s price setting frequency grew from 11.94% of the total number of price setting periods in Q1 2021 to 45.13% in Q2 2021. Likewise, G3’s price setting frequency contracted from 50.23% in Q1 2021 to 11.10% in Q2 2021 when its generation facilities were under planned maintenance more frequently and could not be offered to the market.
Table 4. Demand Response Activations

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Date</th>
<th>Period</th>
<th>USEP ($/MWh)</th>
<th>CUSEP ($/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2 2020</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Q1 2021</td>
<td>8 March 2021</td>
<td>23</td>
<td>218.91</td>
<td>297.12</td>
</tr>
<tr>
<td></td>
<td>8 March 2021</td>
<td>24</td>
<td>239.26</td>
<td>376.24</td>
</tr>
<tr>
<td>Q2 2021</td>
<td>7 May 2021</td>
<td>29</td>
<td>237.36</td>
<td>238.34</td>
</tr>
<tr>
<td></td>
<td>11 May 2021</td>
<td>23</td>
<td>399.65</td>
<td>401.91</td>
</tr>
</tbody>
</table>

Table 4 lists the demand response activations in Q2 2020, Q1 2021 and Q2 2021, and the associated USEP and counterfactual USEP (“CUSEP”) during those periods.

Q2 2020 was a quiet quarter with no demand activations and no USEP spikes. Demand response was activated for two periods for each Q1 2021 and Q2 2021, but there were more USEP spike periods in Q2 2021 (17 periods) than in Q1 2021 (one period).

At period 29 on 7 May 2021, the system experienced the daily peak demand of 7,035 MW. Correspondingly, the supply cushion weakened to 15.93%, which was the lowest level observed that day. Demand response was activated to meet the high demand, which then reduced the CUSEP of $238.34/MWh to a USEP of $237.36/MWh for that period. Thereafter, the demand and USEP started decreasing with no further demand activation for the rest of the day.

As for period 23 on 11 May 2021, the demand response activation was amid a series of USEP spikes that day, namely periods 20 to 22 and periods 29 to 35 (10 periods). The USEP spikes occurred when the supply cushion was below 15.00%. Although there was no USEP spike observed at period 23 as the supply cushion recovered from sub-15.00% to 15.33%, the demand was still high at 7,102 MW, compared to the day’s average of 6,537 MW. Therefore, demand response was activated to cope with the high demand and the market cleared at $399.65/MWh instead of $401.91/MWh.

Apart from demand response, ancillary services such as contingency reserve and regulation were also used to supplement the supply to meet the high demand in the system on 11 May 2021. Consequently, the prices of ancillary services increased significantly – contingency reserve price increased from $20.00/MWh before the USEP spikes and remained at $184.99/MWh throughout the USEP spikes; regulation price rose from $21.19/MWh before the USEP spikes and averaged at $190.10/MWh during the USEP spikes.

Given the extended duration of USEP spikes on 11 May 2021, it was also observed that the USEP had exceeded $1,000/MWh to reach $1,008.07 at period 21 and $1,008.48/MWh at period 32, which has been the highest periodic USEP observed in 2021 up to the end of Q2 2021. The last time the USEP recorded similar levels was at period 33 on 20 November 2020, when the USEP reached $1,014.16/MWh.
Compliance Statistics for Q2 2021

<table>
<thead>
<tr>
<th>Potential Breaches of the Market Rules</th>
<th>Determinations*</th>
<th>Enforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>106 cases in total</td>
<td>83 determinations in total</td>
<td>4 cases in total</td>
</tr>
<tr>
<td>1 self-report</td>
<td>4 cases determined to be in breach</td>
<td>1 financial penalty</td>
</tr>
<tr>
<td>105 referrals/complaints</td>
<td>2 cases determined to take no further action</td>
<td>3 non-compliance letters</td>
</tr>
<tr>
<td>0 MSCP initiative</td>
<td>77 cases determined not to be in breach</td>
<td>0 suspension order</td>
</tr>
</tbody>
</table>

*This section includes determinations of cases referred to the MSCP in previous quarters.

The MSCP issued four rule breach determinations in Q2 2021 to:

i. MSD International GmbH (Singapore Branch) for its late payment of annual market participant fees 2021;

ii. Keppel Seghers Tuas Waste-to-Energy Plant Pte. Ltd. (in its capacity as Trustee of Tuas DBOO Trust) for its failure to comply with gate closure rules on 15 January 2021;

iii. Senoko Energy Pte. Ltd. for its failure to comply with gate closure rules on 19 January 2021; and

iv. Enel X Singapore Pte. Ltd. for its failure to maintain its reserve scheduled on 20 April 2021.
MSCP Market Watch

The MSCP Market Watch is a quarterly report prepared by the Market Assessment Unit ("MAU") of EMC and submitted to the MSCP. The report summarises the MAU's day-to-day monitoring, cataloguing and evaluation activities and analyses, and compares the market performance for the current quarter with the quarter a year ago and the previous quarter.

All prices and percentages in this report are rounded off to two decimal places.

The User Guide to MSCP Market Watch provides a glossary of the terms used in the MSCP Market Watch among other information to facilitate readers' understanding.

Market Surveillance and Compliance Panel

The MSCP is established by the EMC Board in accordance to section 2.6 of Chapter 3 of the Singapore Electricity Market Rules.

The MSCP, with the assistance of the MAU, monitors and investigates the conduct of market participants, the market support services licensee, EMC and the Power System Operator and the structure and performance of the wholesale electricity markets.

The MSCP comprises the following members:
- T P B Menon, Chair
- Lee Keh Sai
- Philip Chua
- Professor Euston Quah
- Professor Walter Woon

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