National Electricity Market of Singapore

MARKET SURVEILLANCE & COMPLIANCE PANEL

ANNUAL REPORT 2025

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EXECUTIVE SUMMARY

The Market Surveillance and Compliance Panel (MSCP) Annual Report presents analysis of annual data and information about Singapore's wholesale electricity market. This edition of the report is based on market data and monitoring indices for the period 1 January to 31 December 2025, which were compiled and analysed by the Market Assessment Unit of Energy Market Company as part of its market monitoring and compliance functions.

This report has been reviewed and approved by the MSCP and provides an assessment of the wholesale electricity market's performance, highlighting key observations on a range of supply, demand and price indices for 2025, and how they compare to previous years.

Supply Indices

A surge in the average electricity supply in the National Electricity Market of Singapore (NEMS), coupled with a slim increase in average demand, suppressed wholesale electricity prices to lower levels compared to the preceding year.

- Average supply increased 5.77% from 7,427 megawatts (MW) in 2024 to 7,855MW this year, in line with the lowest average outage level since 2016 of 1,126.18MW per period in 2025.
- Supply cushion[1] continued its upward momentum from last year's average of 12.74% to 16.64% in 2025.
- The average capacity ratio[2] of all generation types expanded this year, namely the Combined Cycle Gas Turbine (CCGT), Steam Turbine (ST), Other Facilities (OT), Open Cycle Gas Turbine (OCGT), Electricity Imports (Import) and Energy Storage System (ESS) averaged at 67.31%, 51.48%, 27.82%, 3.98%, 9.32% and 9.76% respectively. Notably, Import[3] and OCGT saw significant boosts to their capacity ratio following the registration of new facilities in the market, while the ST capacity ratio increased amidst higher scheduled output and lower registered capacity (following the de-registration of several ST facilities in 2024).
- Based on metered energy quantity, the market concentration in the generation sector of the NEMS largely remained the same, with the combined market share of the three largest generation companies dipping marginally from 51.11% in 2024 to 50.78% in 2025.
- The average market share, as measured by metered energy quantity, of each generation type recorded only minor shifts from 2024. CCGT continued to be the predominant generation type in the NEMS, with the market share dipping slightly to 96.99% in 2025 compared to 98.10% in 2024. The market shares of the ST, OT, OCGT, Import and ESS generation types averaged 1.16%, 0.75%, 0.59%, 0.51% and 0.00% respectively this year.

Demand Indices

The average electricity demand in the NEMS rose 0.97% in 2025 to reach a new high since market start.

- The average demand climbed 0.97% from 6,486MW in 2024 to 6,549MW in 2025. This year also recorded the highest monthly average electricity demand since market start at 6,813MW in July.
- The accuracy of the real-time load forecast weakened in 2025. After dipping to the smallest forecast error recorded since market start in 2024 at 0.44%, the average forecast error increased to a three-year high of 1.28%.

Price Indices

In line with the improvement of the supply cushion in 2025, the average Wholesale Electricity Price (WEP) decreased for the third consecutive year.

- The WEP decreased from $163.12 per megawatt hour (MWh) in 2024 to $117.78/MWh in 2025. This was the lowest annual average level since the WEP fell to $70.25/MWh in 2020.
- The falling WEP was consistent with the easing of the fuel oil price, which sank from US$468.35 per metric tonne (MT) in 2024 to US$420.08/MT in 2025.
- The Uniform Singapore Energy Price (USEP) followed a similar trend to the WEP, falling 28.56% from $163.18/MWh in 2024 to $116.57/MWh in 2025. This was also reflected in mostly lower monthly average prices, which all cleared below $200/MWh in 2025 compared to nine months in the previous year.
- The total reserve payment tumbled 38.75% from $76.30 million in 2024 to $46.74 million in 2025. Despite a slight climb in the reserve requirement compared to the preceding year, the lower reserve payment was largely driven by the contingency reserve price plummeting 40.85% from the previous year to an average of $11.65/MWh and a modest 0.32% decrease in the primary reserve price to $2.85/MWh in 2025.

[1] Supply cushion measures supply adequacy, the level of capacity which was offered but not scheduled and could be called up if necessary. Details can be found in the User Guide of this report.
[2] Capacity ratio measures the ratio of scheduled output to a generation registered facility's maximum generation capacity. Details can be found in the User Guide of this report.
[3] The registration of new Import facilities occurred in late 2024. Therefore, the full impact of the additional capacity on the capacity ratios was largely observed from 2025 onwards.

INTRODUCTION

The Market Surveillance and Compliance Panel (MSCP) is an independent body established under the Singapore Electricity Market Rules (Market Rules). The work of the MSCP is guided by the functions and duties assigned to it under the Market Rules, namely monitoring, surveillance, and investigation responsibilities over the National Electricity Market of Singapore (NEMS).

The Market Rules establish that the MSCP monitors and investigates the conduct of market participants, the Market Support Services Licensee, the Power System Operator (PSO) and Energy Market Company (EMC), as well as the structure and performance of, and activities in, the wholesale electricity market that provide indications of the following phenomena:

- potential breaches of the Market Rules, the market manuals, or the System Operation Manual;
- actual or potential design or other flaws and inefficiencies in the Market Rules, market manuals, System Operation Manual, and other rules and procedures of EMC or the PSO. This includes an assessment of whether the underlying structure of the wholesale electricity market is consistent with the efficient and fair operation of a competitive market; and
- actual or potential design or other flaws in the overall structure of the wholesale electricity market.

When appropriate, the MSCP may exercise the enforcement powers conferred on it under the Market Rules and recommend remedial actions to mitigate the conduct and inefficiencies referred to above. This includes, but is not limited to, the imposition of financial penalties and the issuance of non-compliance letters, suspension orders, termination orders, and revocation orders. All enforcement actions are administered by EMC at the direction of the MSCP.

Additionally, the MSCP assists the Energy Market Authority (EMA) with fulfilling its obligations regarding competition and abuse of a dominant position under sections 50 and 51 of the Electricity Act, Chapter 89A.

Structure and Composition of the MSCP

In accordance with the Market Rules, the Chair and members of the MSCP are appointed by the EMC Board for a three-year term of office and are subject to reappointment. The appointed panel members are specially selected to ensure that the MSCP as a whole has extensive and relevant experience covering the areas of competitive wholesale electricity market or financial or commodity markets, Singapore laws and/or electricity regulations, competition laws and policies, power system operation, and/or economics.

Since the constitution of the MSCP, the EMC Board has endeavoured to appoint professionals with a range of expertise, such that the combined expertise of MSCP members covers the areas specified, and ensures that the MSCP can perform the functions and duties assigned under the authority of the Market Rules, any applicable market manual, constituent documents and any resolution of the EMC Board.

The current composition of the MSCP reflects an appropriate mix of skill sets, experience, and qualifications that are relevant to assess and safeguard the governance of the market. In exercising its duties, the MSCP is supported by the Market Assessment Unit (MAU).

INTRODUCTION

Professor Walter Woon, Chairman, MSCP

Professor Woon, Senior Counsel, is currently Lee Kong Chian Visiting Professor at the Yong Pung How School of Law, Singapore Management University, an Honorary Fellow of St John's College Cambridge, and an Emeritus Professor at the National University of Singapore, having held the post of David Marshall Professor at the Law Faculty of the National University of Singapore for 12 years until his retirement in 2022.

In addition, Professor Woon has held many prominent appointments in the past, including Attorney-General (2008 to 2010), Solicitor-General (2006 to 2008), Ambassador (1997 to 2006), legal adviser to the President and Council of Presidential Advisers (1995 to 1997) and Nominated Member of Parliament (1992 to 1996).

Professor Woon's main areas of interest are company law, criminal law, and international law. He has published many articles, and written law books and novels.

Professor Woon was appointed a member of the MSCP in 2016 and became the Chairman of the Panel in 2022. During his years as a member of the MSCP, Professor Woon has contributed significantly to the Panel by supporting and clarifying several legal matters related to the application of the Market Rules and the provisions established in Singapore law.

Mr Yeo Yek Seng

Mr Yeo Yek Seng is the former deputy chief executive of the Energy Market Authority of Singapore (EMA). Before his retirement, he oversaw the regulation of the electricity and gas industries in Singapore, planning of the electricity and gas transmission infrastructure and development of the electricity market. Prior to his appointment in the EMA, Mr Yeo was with the Public Utilities Board, holding various engineering and managerial positions in its Electricity Department before rising to the position of Director, Regulation Department.

Mr Yeo holds a Bachelor of Engineering (Electrical Engineering), 1st Class Honours (1973) and a Master of Science (Industrial Engineering) (1980), both degrees from the University of Singapore. He is also a Fellow of the Institution of Engineers, Singapore. In 2012, Mr Yeo received the Public Administration Medal (Gold) at the National Day Awards.

Mr Yeo has been a member of the MSCP since 2023. Mr Yeo's noteworthy expertise has added great value to the Panel by bringing a technical expert angle from his deep knowledge of the electricity and gas industries.

Mr Philip Chua

Mr Philip Chua is a consultant in the financial industry. Prior to this, he was the senior country executive of American Express Bank Singapore. As the bank's chief executive, he drove local integration of global strategic directions and was also responsible for the bank's governance.

Concurrently, Mr Chua was the head of Global Financial Markets South East Asia, global product head of the Collateralized Trading Program, and regional treasurer for Asia, positions which he assumed progressively after joining the bank. He also served as a council member of the Association of Banks in Singapore and was a lecturer with the Institute of Banking & Finance.

Mr Chua's vast experience in financial markets began with his banking career at Chase Manhattan Bank, where he was Second Vice President and Senior Dealer, Money Market, before joining American Express Bank.

Mr Chua holds a Master of Business Administration from the Kelley School of Business at Indiana University, Bloomington, Indiana, USA, and a Bachelor of Science in Business Administration, summa cum laude, from the University of Oregon, Eugene, Oregon, USA.

Mr Chua has been a member of the MSCP since 2008. Mr Chua's financial trading and management experience across different instruments and markets have provided the MSCP with a broader perspective of the market dynamics, and market participants' behaviour in response to market conditions, price movements, and market liquidity, ensuring that the MSCP's determinations are consistent with the financial stability of the market.

INTRODUCTION

Professor Euston Quah

Professor Euston Quah is Albert Winsemius Chair Professor of Economics, Professor of Cost-Benefit Analysis and Environment, and Director, Economic Growth Centre at the Nanyang Technological University, Singapore. He is also president of the Economic Society of Singapore, and editor of the Singapore Economic Review. Professor Quah's extensive research, papers, and articles have been selected for inclusion by the International Library of Critical Writings in Economics in the UK. His textbooks, "Cost-Benefit Analysis", with E.J. Mishan, (6th edition, Routledge UK 2021), and "Principles of Economics", with Gregory Mankiw and Peter Wilson (3rd edition, Cengage Singapore 2021), are used by many universities and governments.

Professor Quah has been listed in Google Scholar Profiler since 2020 among the top ten most highly cited university economists in Cost-Benefit Analysis in the world. He has consulted for Genting International, Price Waterhouse, Canadian International Development Agency, Asian Development Bank, and World Bank, among others. He was formerly vice dean of the Faculty of Arts and Social Sciences at the National University of Singapore and headed the economics departments at both Nanyang Technological University and the National University of Singapore. Professor Quah has been, and continues to be, an advisor to many government ministries in Singapore. He also serves on the Boards of Competition and Consumer Commission of Singapore, Energy Market Authority, Energy Studies Institute (NUS), Institute of Southeast Asian Studies, among others. He was a recipient of the Public Administration Medal (Silver) in 2020.

Professor Quah has been a member of the MSCP since 2015. His experience in undertaking cost-benefit analysis, evaluating government policies, and his extensive knowledge of environmental economics, provide a framework based on economic principles for the analysis of electricity market drivers, market trends, and market player incentives and behaviour.

Professor Quah has also been a solid contributor and supporter of the improvements applied to the econometric model for the Uniform Singapore Energy Price outliers.

Dr Stanley Lai

Dr Stanley Lai, Senior Counsel, is the head of Allen & Gledhill's Intellectual Property (IP) Practice and co-head of the Cybersecurity & Data Protection Practice and Partner of the Litigation & Dispute Resolution Department.

Dr Lai specialises in all forms of IP litigation and information technology disputes and is also a commercial/chancery litigator and arbitration counsel. He maintains a strong advisory practice for IP/data management and cybersecurity, and represents clients in investigations that are undertaken by the Personal Data Protection Commission. In the biomedical and pharmaceutical sectors, Dr Lai has substantial experience in advising on healthcare and medical IP and regulatory issues.

Dr Lai was formerly the Chairman of the Intellectual Property Office of Singapore. Dr Lai is also a member of the Singapore International Arbitration Centre Panel of IP Arbitrators, and serves as the deputy president of the Copyright Tribunal. Dr Lai serves as a senior mediator of the Singapore Mediation Centre and as a specialist mediator in the Singapore International Mediation Centre. He is also a member of the Patent Mediation and Arbitration Centre (PMAC) of the Unified Patent Court (Europe).

Dr Lai is the first Singapore-born lawyer to be conferred a Ph.D. in Law from the University of Cambridge. He was awarded the Public Service Medal (Pingat Bakti Masyarakat) in 2020, and the Public Service Star (Bintang Bakti Masyarakat) in 2024. In 2022, he received the Singapore Academy of Law Merit Award.

Dr Lai has been a member of the MSCP since 2022. Dr Lai's broad business law experience and special expertise in Competition Laws provide a further dimension of knowledge to the MSCP, involving the dynamics of different models of market structure, as well as the behaviour and interaction between market players applied to various markets in Singapore.

INTRODUCTION

Decisions of the MSCP

The decisions made by the MSCP lie fundamentally upon the monitoring, evaluations and analyses undertaken by the MAU, which are regularly reported to the MSCP. Under the Market Rules, the quorum for the transaction of any business at a meeting of the MSCP is a simple majority of the appointed members, and all decisions of the MSCP are made by a majority of the votes cast, with each MSCP member eligible to cast one vote unless there exists a conflict of interest that requires the member(s) to abstain from voting on the given matter.

Where the MSCP concludes that a breach has occurred, a determination recording the facts and circumstances of the breach and details of any sanctions imposed will be published on the Panel Determinations section of the EMC website.

Market Assessment Unit

The MAU manages the market surveillance, compliance, and dispute resolution processes. It advises and supports three external and independent governance bodies: namely the MSCP, the Dispute Resolution Counsellor (DRC), and the Dispute Resolution and Compensation Panel (DRCP).

The MAU enforces compliance with the Market Rules through its surveillance activities, investigations of alleged rule breaches, as well as supporting and advising the independent MSCP on enforcement actions. It monitors the outcomes of the wholesale electricity market and the behaviour of market participants to ensure that the market is functioning efficiently and identifies areas of inefficiency. It provides market training to and advises the MSCP on the state of competition and efficiency of the wholesale market, for the MSCP to recommend changes or remedial actions to the EMA to address areas of inefficiency. The MAU also acts as the key point of communication between market players and the MSCP.

The MAU assists the DRC with setting up and maintaining dispute management systems among market participants. It provides market training and operational support to the DRC and the DRCP members on all dispute-related matters.

While the Market Rules provide for employees of the MAU to report to and be administratively managed by EMC, the MAU also reports to and takes direction from the Chairman of the MSCP on all matters related to the market monitoring and investigation duties contained in the Market Rules.

MSCP Annual Reporting

The MSCP Annual Report is developed in accordance with section 4.4.6 of Chapter 3 of the Market Rules. Pursuant to these provisions, the MSCP is required to prepare an annual report on the conduct of its monitoring activities and investigations for submission to EMC and its subsequent provision to the EMA.

The annual report includes a summary of routine reports on the MSCP's monitoring and investigation activities, and a summary of any report regarding the possibility of anti-competitive agreements or the abuse of a dominant position contrary to sections 50 or 51 of the Electricity Act. The report also contains a summary of all complaints or referrals filed and investigations commenced and concluded, a summary of all investigations conducted by the MSCP concerning offer and bid variations after gate closure reported by EMC, and a general assessment by the MSCP of the state of competition and compliance within, and the efficiency of, the wholesale electricity market.

The MSCP Annual Report 2025 covers the period 1 January to 31 December 2025 and provides the MSCP with the opportunity to highlight significant outcomes relating to supply, demand, and electricity prices in the NEMS to inform market participants, potential entrants to the market, the regulatory body, and the industry as a whole about the market conditions observed throughout the year. The MSCP Annual Report also includes a section on the MSCP's market compliance decisions and enforcement actions taken by the MSCP based on the investigation of alleged breaches as part of its monitoring and compliance functions.

This is the 24th report issued and published by the MSCP since 2003 on the wholesale electricity market of the NEMS. All annual reports by the MSCP are publicly available under the Publications section of the EMC website.


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CATALOGUE OF DATA AND CATALOGUE OF MONITORING INDICES/INDICATORS OF MARKET PERFORMANCE

Catalogues of Data and Monitoring Indices

The Singapore Electricity Market Rules (Market Rules) provide for the Market Assessment Unit (MAU), under the supervision and direction of the Market Surveillance and Compliance Panel (MSCP), to develop a catalogue of the data it acquires and a catalogue of the monitoring indices to evaluate market performance.

The Catalogue of Data and Catalogue of Monitoring Indices are publicly available on the Energy Market Company (EMC) website.

The information contained under the Catalogue of Data is collected by the MAU on a pre-determined frequency from different sources (including EMC, the Power System Operator (PSO), and market participants) and is broadly categorised as facility characteristics data (belonging to the generation registered facility, generation settlement facility, load registered facility and import registered facility), transmission system data, supply data, demand data, price data and other data.

The Catalogue of Monitoring Indices adopted by the MSCP include market concentration indices, supply indices, demand indices, price indices and ancillary services indices, as listed in Table 1.

The latest Catalogues were published and made effective on 1 September 2024. The MSCP/MAU continues its effort to regularly evaluate the Catalogues to ensure that the data remains relevant and the monitoring mechanisms stay effective.

Indicators of Market Performance

The MAU submits regular market performance monitoring updates to the MSCP. These updates include observations of several market performance indicators which are broadly classified into supply, demand, price, as well as energy and ancillary services indices.

[4] The list of means of evaluation is not exhaustive and is only intended to provide examples under the monitoring index. This may be subject to change depending on market conditions, which would determine the evaluation that is best suited.

TABLE 1: CATALOGUE OF MONITORING INDICES

Type of Index	No.	Monitoring Index	Means of Evaluation[4]
Market Concentration	1	Market Concentration Index	Market share by: (a) generation type; (b) generation licensee; and (c) generation registered facility
	2		Herfindahl-Hirschman Index (HHI)
	3		Pivotal supplier test
Supply	4	Price Setter Index	Trend of price setting generating units
	5	Utilisation Index	Capacity ratio: Ratio of a generation registered facility's (a) scheduled generation output to (b) maximum generation capacity
	6	Outage Index	Trend of outage volume
	7	Offer Index	Supply cushion: Ratio of (a) the difference between total offered volume and system demand to (b) total offered volume
			Available generation capacity: Capacity that is not offered to the market even though the generation units are not on planned or unplanned maintenance
			Analysis of offer/bid variations or revisions to standing offers/bids exceeding offer/bid change limits
	8	Demand Response Index	Trend of demand response activation
Demand	9	Actual Demand Index	Trend of actual demand
	10	Load Forecast Index	Comparison of load forecast with real-time load forecast
			Comparison of real-time load forecast with metered generation quantity
Price	11	Energy Price Index	Trend of Uniform Singapore Energy Price (USEP)
			Trend of Wholesale Electricity Price (WEP)[4] and its correlation with vesting price, fuel oil price and electricity tariff
			Correlation between WEP and system demand
			Percentage of hours and quantity of load when WEP falls into a particular price range
			Comparison of latest available short-term schedule projected prices with real-time prices
Ancillary Services	12	Reserve Index	Trend of reserve prices
			Trend of reserve requirement and reserve payment
	13	Regulation Index	Trend of regulation prices and comparison of trends
			Trend of regulation availability
	14	Interruptible Load Index	Trend of interruptible load activations in the contingency reserve market
			Trend of interruptible load in provision of scheduled reserve

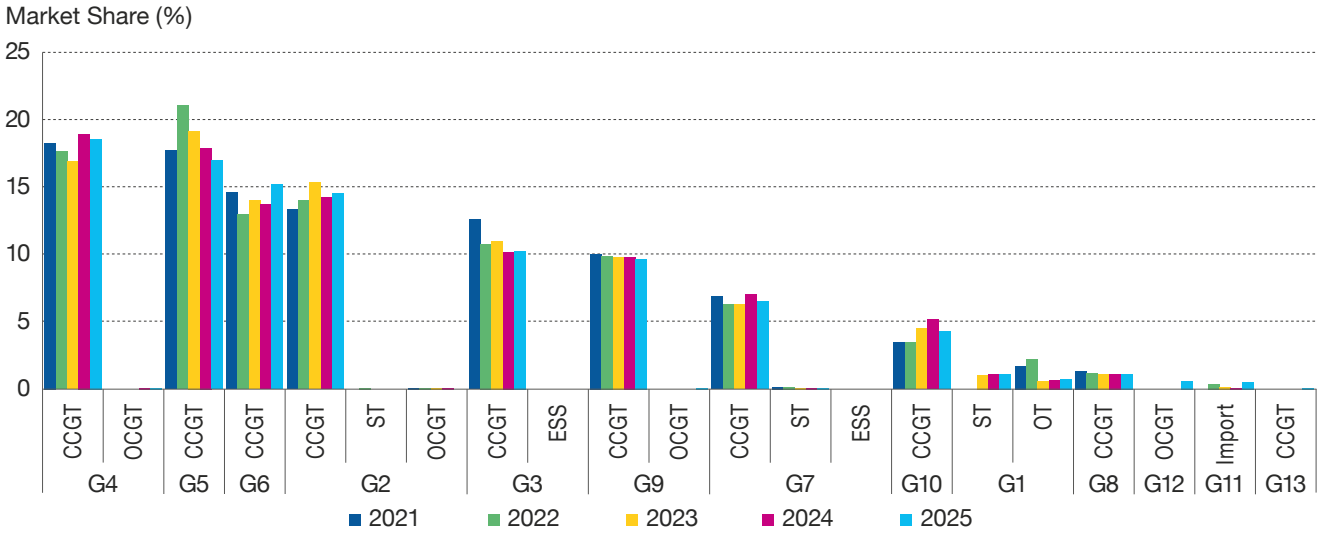
MARKET MONITORING
MARKET CONCENTRATION: MARKET SHARE

Chart 1 shows the market share by generation type of each generation company in the National Electricity Market of Singapore (NEMS) measured by the metered energy quantity, for the last five years. The generation companies are arranged in descending order according to their market share in 2025.

The market continued to be dominated by Combined Cycle Gas Turbine (CCGT) units, which accounted for a combined market share of 96.99% in 2025. This was followed by Steam Turbine (ST) units under G1 and G7, Other Facilities (OT) under G1, Open Cycle Gas Turbine (OCGT) units under G4, G9 and G12, and Electricity Imports (Import) under G11, which contributed 1.16%, 0.75%, 0.59%, and 0.51% of total generation respectively. Energy Storage System (ESS) units under G3 and G7 recorded net zero generation in 2025.

The combined CCGT market share fell below 97% for the first time in the past ten years. Import and OCGT recorded notable increases in market share in 2025, reflecting the entry of new facilities that commenced operations in the last quarter of 2024. While the market share of ST units remained unchanged, the market share of OT units increased slightly by 0.08 percentage point, continuing the upward trend observed since 2024.

CHART 1: MARKET SHARE BASED ON METERED ENERGY QUANTITY BY GENERATION COMPANY AND GENERATION TYPE



Note: OT = other facilities, i.e., incineration plants that convert energy from incinerated refuse.

Table 2 presents the yearly average market share of all generation companies based on metered energy quantity. The number of generation companies increased from 11 to 13 in 2025. The three largest generation companies this year, G4, G5, and G6, collectively accounted for 50.78% of total market share, marginally lower than 51.11% in 2024, which was contributed by G2, G4 and G5. This outcome aligns with the trend over the past five years, where the top three generation companies consistently held between 50% and 54% market share.

There were only minor changes in the rankings by market share compared to 2024. In addition to G6 overtaking G2 for the third place, the new entrant G12 surpassed G11 to rank eleventh place.

TABLE 2: MARKET SHARE BASED ON METERED ENERGY QUANTITY BY GENERATION COMPANY (%)

Year	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13
2021	1.71	13.35	12.53	18.22	17.77	14.52	7.01	1.37	10.03	3.41	-	-	-
2022	2.25	14.13	10.75	17.67	21.08	12.91	6.43	1.20	9.83	3.42	0.34	-	-
2023	1.68	15.26	11.01	16.99	19.12	13.99	5.48	1.15	9.86	4.54	0.16	-	-
2024	1.80	14.25	10.20	18.95	17.92	13.70	7.11	1.13	9.74	5.17	0.04	-	-
2025	1.89	14.48	10.25	18.56	17.03	15.19	6.51	1.10	9.67	4.26	0.51	0.56	0.05

Note: The percentages in this table may not add up to 100% due to rounding.
Due to a change in methodology, the market share based on metered energy quantity by generation company has been revised since 2024.

MARKET MONITORING
MARKET CONCENTRATION: MARKET SHARE

CHART 2: MARKET SHARE BASED ON MAXIMUM CAPACITY BY GENERATION COMPANY AND GENERATION TYPE

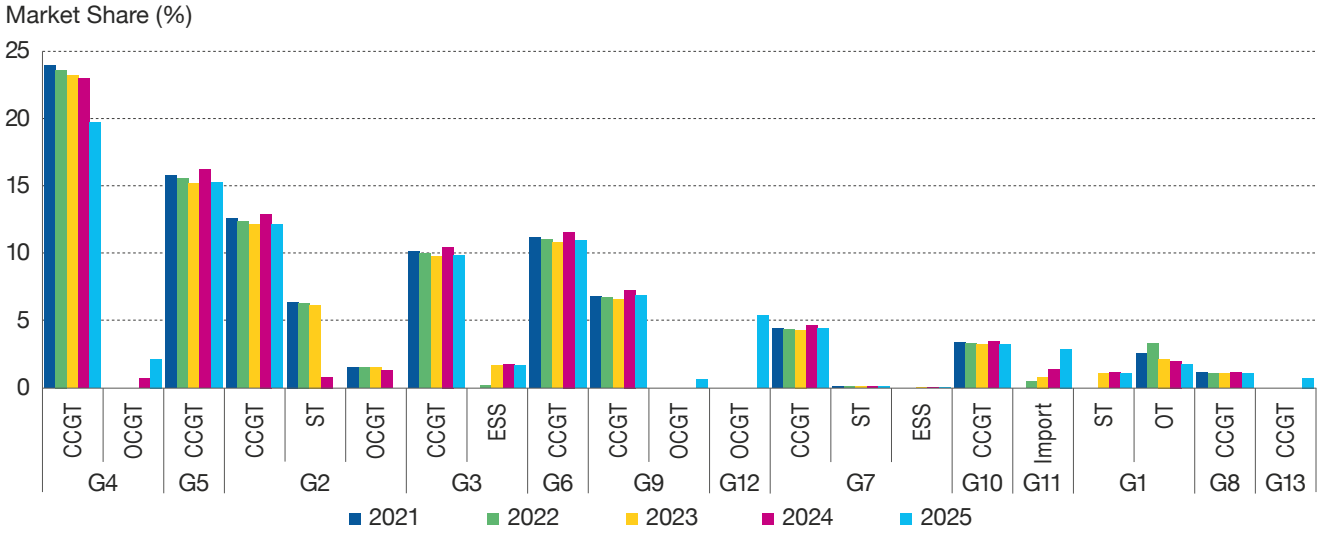


Chart 2 illustrates market share by maximum capacity across generation companies, arranged in descending order based on their 2025 market shares.

In 2025, the CCGT market share by maximum capacity declined to 84.29% and recorded the largest year-on-year drop among all generation types, falling by 6.45 percentage points. Despite the registration of one new CCGT facility in the year, the shrinking of the CCGT market share was primarily picked up by the OCGT and Import generation types, due to the entry of several new facilities in 2025 and late 2024 respectively. OCGT recorded the highest market share growth of 6.18 percentage points, driven by the entry of three new OCGT facilities during the year.

The market share of Imports rose by 1.52 percentage points, reflecting the registration of an Import facility in December 2024. Meanwhile, ST and OT market shares declined by 0.89 and 0.25 percentage point respectively.

TABLE 3: MARKET SHARE BASED ON MAXIMUM CAPACITY BY GENERATION COMPANY (%)

Year	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13
2021	2.57	20.50	10.14	23.95	15.75	11.18	4.56	1.14	6.83	3.38	-	-	-
2022	3.31	20.20	10.20	23.61	15.52	11.02	4.50	1.12	6.73	3.33	0.46	-	-
2023	3.24	19.82	11.47	23.17	15.23	10.84	4.41	1.10	6.62	3.27	0.83	-	-
2024	3.17	15.05	12.20	23.73	16.22	11.60	4.75	1.17	7.26	3.48	1.37	-	-
2025	2.85	12.17	11.48	21.84	15.26	10.94	4.52	1.10	7.47	3.27	2.89	5.44	0.75

Note: The percentages in this table may not add up to 100% due to rounding.

Table 3 consolidates the yearly average market share of generation companies based on maximum capacity. Over the past five years, G2, G4 and G5 (in no particular order) consistently ranked as the top three generation companies. However, their combined market share continued a downward trend, falling to 49.28% in 2025.

Overall, the market shares of most generation companies decreased from the previous year. G2 recorded the largest year-on-year decline in market share of 2.88 percentage points following the de-registration of five facilities in the first and last quarters of 2024. G4 experienced the second-largest reduction in market share of 1.89 percentage points due to the de-registration of two facilities in the second half of 2024.

On the other hand, the market shares for G9, G11, G12 and G13 have strengthened since 2024. G12 recorded the highest year-on-year increase in market share of 5.44 percentage points due to the registration of two facilities in 2025, while G11's market share rose by 1.52 percentage points following the registration of two facilities at the end of 2024. G9 and G13 both registered one new facility in 2025, lifting their market shares marginally by 0.21 and 0.75 percentage point respectively.

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MARKET CONCENTRATION: HERFINDAHL-HIRSCHMAN INDEX

TABLE 4: HERFINDAHL-HIRSCHMAN INDEX

Year	Minimum	Maximum	Average	Maximum Share (%)
2021	1,322	1,433	1,366	18.22
2022	1,326	1,512	1,407	21.08
2023	1,322	1,455	1,371	19.12
2024	1,293	1,463	1,369	18.95
2025	1,279	1,498	1,352	18.56

Note: Due to a change in methodology, the market share based on metered energy quantity by generation company (on which the HHI is based) since 2024 has been revised.

The Herfindahl-Hirschman Index (HHI) is a widely used indicator of market concentration in electricity markets. Higher HHI values indicate fewer generation companies and/or greater disparities in market shares.

HHI is calculated by summing the squares of each generation company's market share (expressed as decimals) based on metered energy quantity and multiplying the result by 10,000. Table 4 shows the average HHI for each year, calculated based on an average of the HHI for each month of the year.

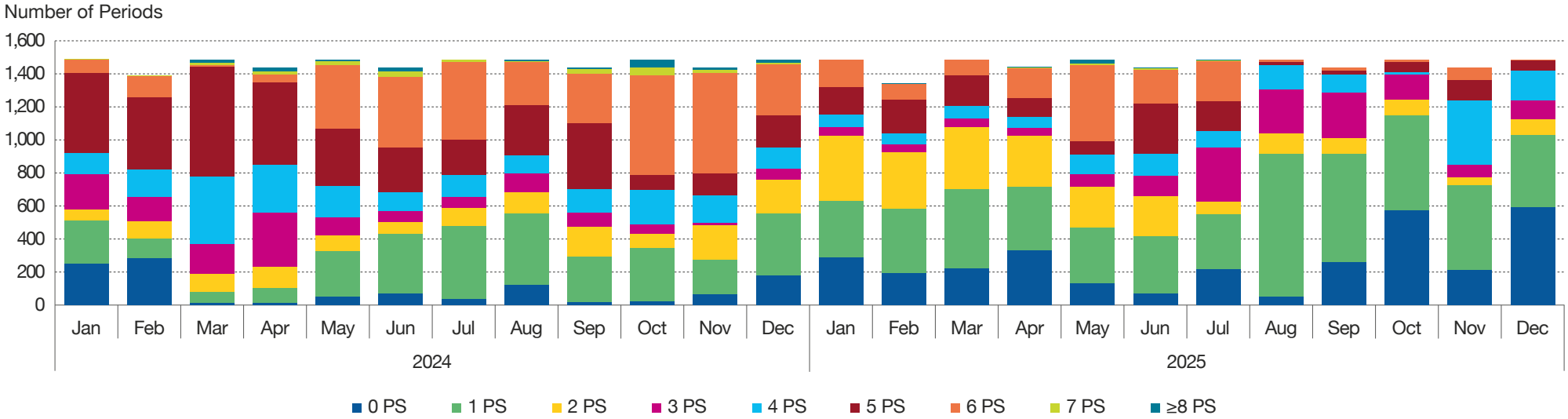
The HHI in Table 4 calculates the market share of generation companies measured by the metered energy quantity of their annual electricity generation. The HHI classifies the electricity market into three categories: in "unconcentrated markets" where the index is below 1,000, in "moderately concentrated markets" where the index is between 1,000 and 1,800, and in "highly concentrated markets" where the index is above 1,800. The classification is adopted from the United States Department of Justice and the Federal Trade Commission under the Horizontal Merger Guidelines in 1992.

In 2025, the average HHI for the NEMS fell for the third consecutive year to 1,352, indicating reduced market concentration. The lower HHI was driven by the entry of G12 and G13, diluting the market share held by incumbent generation companies. This is evident in Table 4 which shows a decrease in the market share held by the generation company with the highest percentage of metered energy quantity, from 18.95% in 2024 to 18.56% in 2025. The range between the maximum and minimum monthly HHI widened from 170 in 2024 to 220 in 2025.

Over the past five years, the monthly HHI values have remained within 1,200 to 1,500, consistently classifying the NEMS as a moderately concentrated market. This indicates that the overall market concentration in the NEMS has remained fairly consistent throughout the years.

MARKET MONITORING
MARKET CONCENTRATION: PIVOTAL SUPPLIER TEST

CHART 3: FREQUENCY OF GENERATION COMPANIES AS PIVOTAL SUPPLIERS (PS) PER PERIOD



The pivotal supplier test is an indicator of structural market power in the NEMS, helping to identify suppliers which have the potential to influence market prices due to their critical role in meeting demand. A pivotal supplier is present when the total system demand for a particular period cannot be met without including the supply capacity of any one market participant.

Chart 3 shows the monthly frequency of pivotal suppliers in 2024 and 2025. Comparing across the two years, periods with zero to three pivotal suppliers increased while periods with four or more pivotal suppliers decreased. Periods with no pivotal suppliers recorded the largest year-on-year percentage increase, rising by 177.74% from 1,141 to 3,169 periods in 2025. Periods with one pivotal supplier increased the most based on absolute numbers, from 3,234 periods in 2024 to 5,668 periods in 2025. On the other hand, periods with seven pivotal suppliers noted the largest year-on-year percentage decrease, as it dropped 88.89% from 234 periods in 2024 to 26 periods in 2025. The number of periods with five pivotal suppliers decreased the most significantly based on absolute numbers, falling from 4,029 periods in 2024 to 1,528 periods in 2025.

The maximum number of pivotal suppliers per period declined from 20 in 2024 to 11 in 2025. Notably, in 2025, one period had 11 pivotal suppliers and two periods had ten pivotal suppliers. During these three periods, the supply cushion fell below 1.00%, pushing the USEP to clear above $900/MWh and several instances of energy and/or ancillary service shortfalls occurred.

In 2025, it was observed that generation companies with predominantly CCGT portfolios were more likely to be pivotal suppliers.

MARKET MONITORING
SUPPLY INDICES: CAPACITY RATIO

TABLE 5: CAPACITY RATIO BY GENERATION TYPE (%)

Year	CCGT	ST	OT	OCGT	Import	ESS
2024	66.44	45.43	25.95	0.55	0.82	9.19
2025	67.31	51.48	27.82	3.98	9.32	9.76
YOY Change	0.86	6.05	1.88	3.43	8.50	0.57

The capacity ratio measures the utilisation level of each generation type, calculated as scheduled output relative to its maximum generation capacity. Table 5 compares the average capacity ratio of the six generation types in 2024 and 2025.

2025 recorded a positive year-on-year change in capacity ratio for all generation types. The NEMS also continued to rely on the CCGT units, as the most efficient generation type, to meet system demand – CCGT units held the largest capacity ratio by generation type at 67.31%.

Notable increases were observed for the Import type which registered the largest year-on-year increase of 8.50 percentage points, due to the higher output levels outpacing the increase in maximum generation capacity following the entry of two new facilities in late 2024. ST and OCGT also followed with increases of 6.05 percentage points and 3.43 percentage points respectively.

For ST and OT, lower maximum generation capacity resulting from the de-registration of several facilities in the first half of 2024, combined with higher output levels, resulted in a higher capacity ratio. For OCGT, the increase in the capacity ratio was attributed to the increase in scheduled output outpacing the higher maximum generation capacity. For ESS, an improved capacity ratio despite the lower output levels overshadowed the higher maximum generation capacity. Lastly, the capacity ratio for CCGT improved as the decline in output level outweighed the reduction in maximum generation capacity.

CHART 4: COMPARISON OF CAPACITY RATIO OF CCGT UNITS

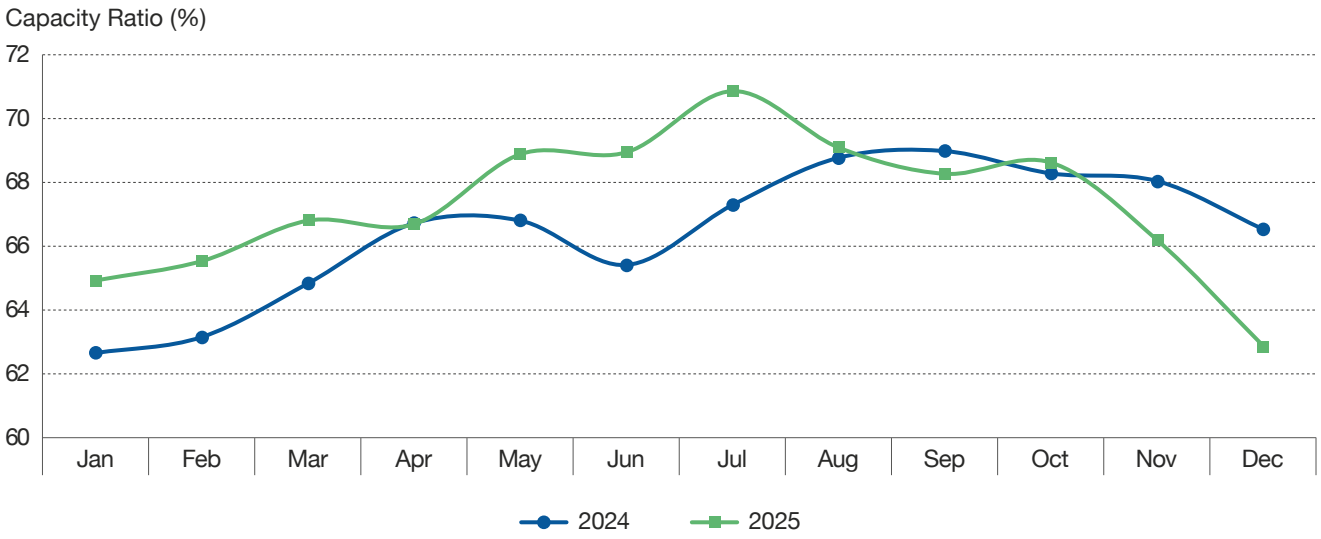


Chart 4 compares the monthly capacity ratio of CCGT units in 2024 and 2025.

The monthly average capacity ratio of CCGT units in 2025 was higher for eight of the 12 months compared to 2024. This was consistent with the overall lower outage levels for CCGT units in 2025.

The monthly capacity ratio trend closely mirrors monthly average demand. The ratio increased steadily from January and peaked in July, with the exception of a dip in April. From July, the capacity ratio generally declined, with a minor uptick in October. The only notable exception occurred in November, when the CCGT monthly capacity ratio declined amidst a rise in demand. This was consistent with higher CCGT outage levels during the month. Additionally, the entry of a new CCGT unit in November increased the maximum generation capacity, but with marginal changes to the scheduled output. This resulted in a dilution of the capacity ratio in November and December.

MARKET MONITORING
SUPPLY INDICES: OUTAGES

TABLE 6: AVERAGE OUTAGES BY GENERATION TYPE (MW)

Year	Planned Outages								Forced Outages								Total Outages	YOY Change (%)
	CCGT	ST	OT	OCGT	Import	ESS	Sum	%	CCGT	ST	OT	OCGT	Import	ESS	Sum	%		
2021	1,027.38	106.99	26.76	5.39	-	-	1,166.53	92.59	84.08	7.62	1.19	0.48	-	-	93.37	7.41	1,259.90	4.50
2022	1,751.34	317.90	98.03	12.79	10.57	-	2,190.63	96.04	88.85	0.32	0.89	0.01	0.16	-	90.23	3.96	2,280.86	81.04
2023	1,668.56	469.42	139.83	15.26	7.80	0.27	2,301.14	97.84	46.54	0.02	3.84	0.02	0.34	0.00	50.76	2.16	2,351.90	3.11
2024	1,111.07	3.40	73.65	73.76	4.70	5.22	1,271.80	98.19	21.69	0.00	0.36	1.46	0.00	0.00	23.51	1.81	1,295.31	-44.93
2025	914.74	0.52	59.70	44.99	0.00	12.61	1,032.56	91.69	84.09	0.03	0.64	8.86	0.00	0.00	93.62	8.31	1,126.18	-13.06

Table 6 summarises the average periodic outage volumes by generation type over the past five years.

In 2025, planned outage levels declined across all generation types, except ESS. The largest reduction by percentage was observed for Import, with no planned outages recorded.

Conversely, forced outage levels increased for most generation types, while Import and ESS remained unchanged at 0MW. The forced outage levels for ST experienced the largest year-on-year increase by percentage, although the absolute change was small at 0.03MW. The forced outage levels for OCGT recorded the second largest increase by percentage, rising sixfold compared to the previous year. It also recorded the second-highest forced outage levels in absolute terms among the generation types and registered the highest year-on-year change within the OCGT type over the five-year period. This increase may be attributed to the commissioning of new OCGT facilities. Both planned and forced outages for CCGT recorded the largest year-on-year change in absolute terms, at 196MW and 62MW respectively.

Overall, the annual average planned outage volume per period declined by 18.81%, from 1,271.80MW in 2024 to 1,032.56MW in 2025, the lowest since 2017. Meanwhile, the annual average forced outage volume per period increased almost fourfold, from 23.51MW in 2024 to 93.62MW in 2025. As a result, the annual average total outage volume fell by 13.06% to 1,126.18MW, the lowest level recorded in the past five years.

MARKET MONITORING
SUPPLY INDICES: OUTAGES

CHART 5: PLANNED OUTAGES VS USEP

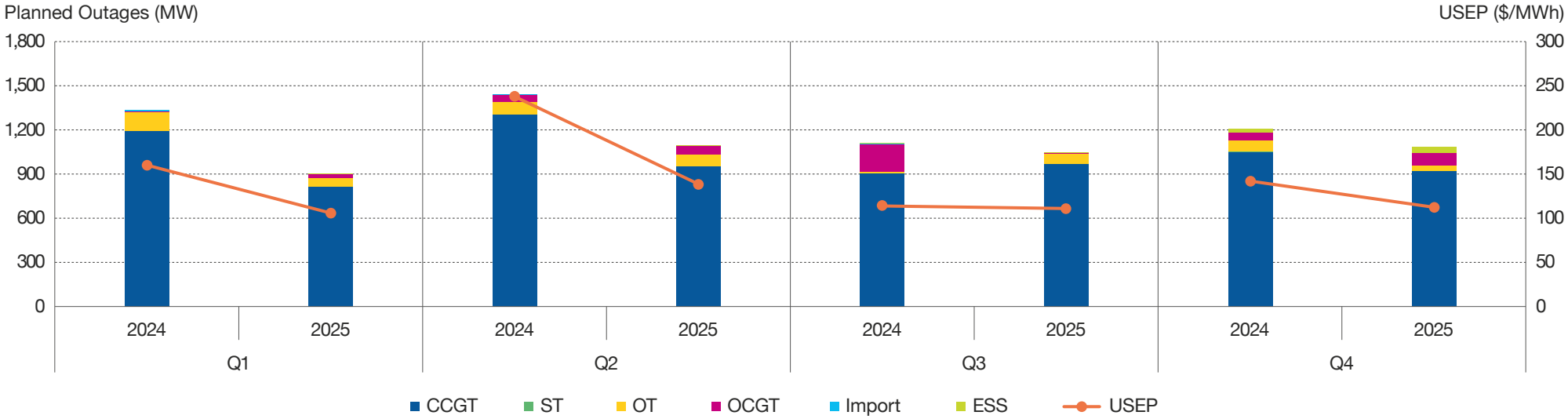


Chart 5 compares the quarterly average planned outages against the quarterly average USEP in 2024 and 2025.

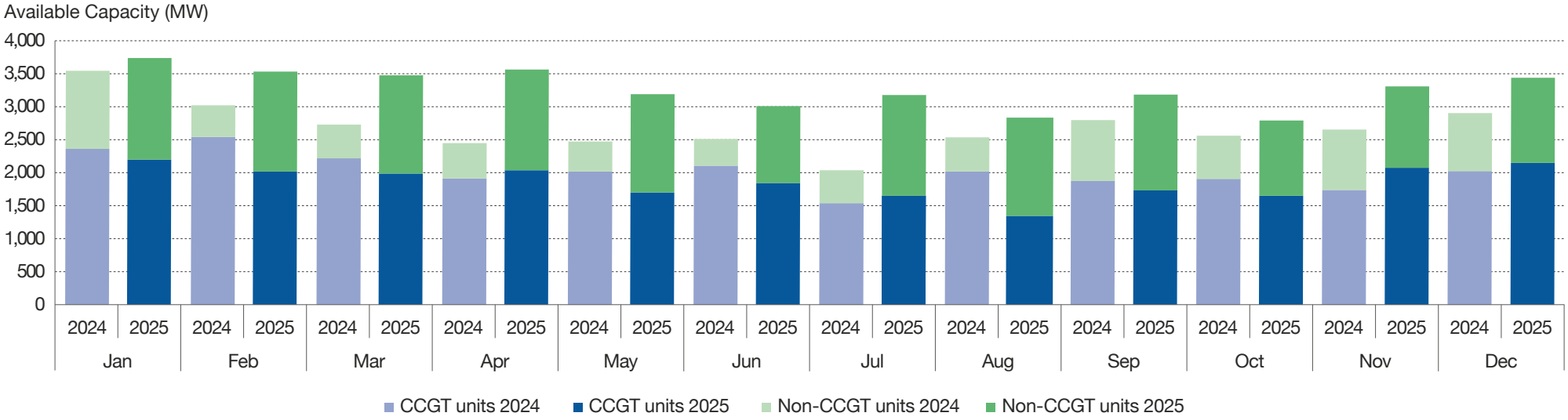
Typically, USEP is expected to move in tandem with planned outage volumes, as a higher outage level reduces supply and exerts upward pressure on prices. Chart 5 shows that, on a year-on-year basis, USEP moved in tandem with planned outage volumes across all quarters of 2025.

Across all quarters, planned outage levels declined year-on-year by between 5.58% (Q3) and 32.72% (Q1), while USEP declined between 3.05% (Q3) and 41.91% (Q2). Notably, in Q2 and Q4 2025, the reductions in planned outage levels of 23.82% and 9.93% drove significant reductions in USEP of 41.91% and 21.07% respectively.

The lower outage levels observed during the year are likely to have boosted supply. The improvement in supply offset the slight growth in demand from 2024, leading to the strengthening of the average supply cushion and relatively more stable USEP in 2025.

MARKET MONITORING
SUPPLY INDICES: AVAILABLE GENERATION CAPACITY

CHART 6: AVAILABLE GENERATION CAPACITY



Note: Following the integration of the ESS facilities in the market to allow for both submission of positive (discharge) and negative (charge) offer quantities, ESS facilities can be scheduled to either charge or discharge. Due to this bi-directional characteristic, the definition of total supply in the NEMS has been revised to exclude ESS supply. Correspondingly, the methodology of available generation capacity has been revised to exclude ESS units.

Chart 6 shows the monthly available generation capacity in 2024 and 2025. Available generation capacity refers to capacity not offered into the market despite generation units not being on planned or unplanned maintenance. Generally, non-CCGT generation types exhibit higher available capacity, as they are not baseload providers and typically offer into the market only under specific conditions.

Throughout 2025, available generation capacity was higher than in the corresponding months of 2024, primarily contributed by non-CCGT units. The available generation capacity for non-CCGT units for this year peaked in January, coinciding with the lowest monthly demand for the year.

In contrast, CCGT units recorded lower available generation capacity in most months compared to the preceding year. Consistent with non-CCGT units, the highest available generation capacity for CCGT units for 2025 was observed in January.

As CCGT units mainly operate on natural gas, gas curtailment occurrences can lead to a shortage of the main fuel for the CCGT units and contribute to higher available capacity. Overall, the available generation capacity for CCGT units declined by 7.68% from the previous year, consistent with the fewer gas curtailment periods of 1,672 periods in 2025 from 1,824 periods in 2024.

MARKET MONITORING
SUPPLY INDICES: SUPPLY CUSHION

CHART 7: RELATIONSHIP BETWEEN SUPPLY CUSHION AND USEP

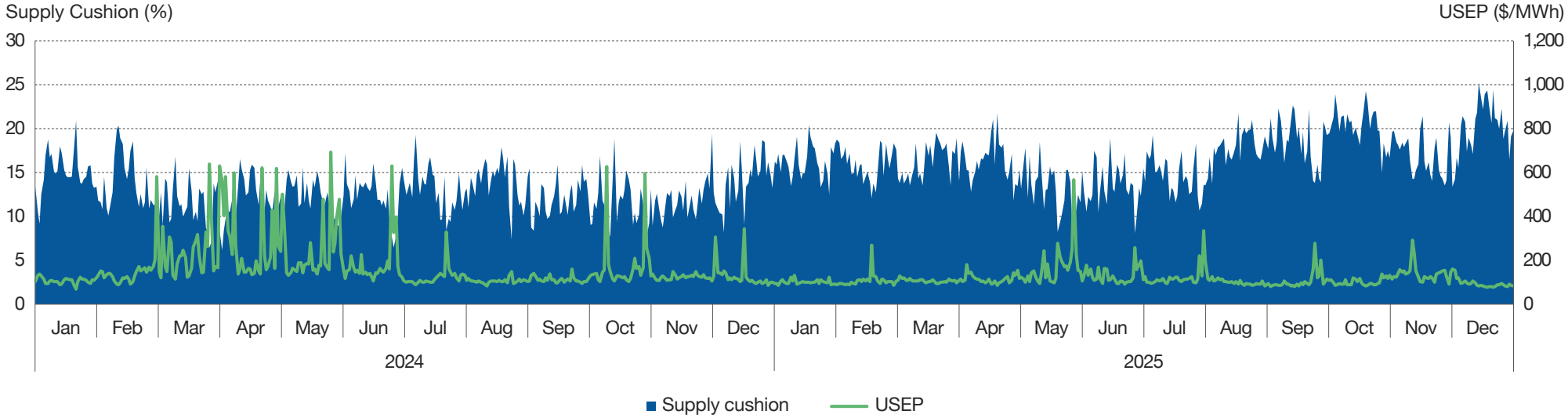


Chart 7 shows the daily average USEP and daily average supply cushion in 2024 and 2025. The supply cushion represents spare capacity available after dispatch. Typically, USEP and supply cushion are inversely correlated, with lower supply cushion leading to higher USEP as more expensive supply is dispatched during tight supply conditions.

In 2025, the yearly average supply cushion increased by 3.90 percentage points, from 12.74% in 2024 to 16.64%. This continued the upward trend observed in recent years, although it remains the fourth-lowest average since market start. The stronger supply cushion led to a sharp decline in the yearly average USEP by 28.56%, from $163.18/MWh in 2024 to $116.57/MWh in 2025.

The improvement in the supply cushion was driven by a 5.77% increase in energy supply, which outpaced a modest 0.97% rise in demand. This expansion in supply is consistent with the lower planned outage levels shown in Table 6.

In 2024, there was greater volatility in the USEP largely due to sustained periods of tighter supply conditions, with the supply cushion dipping below 13.00% for most months. In 2025, USEP was observed to be more volatile in May, specifically on 28 May 2025, due to a combination of higher demand and relatively tighter supply cushion. Overall, 2025 experienced relatively stable USEP alongside a stronger supply cushion. This stability was further supported by lower-priced energy offers. The reduced USEP volatility was also consistent with the fewer dispatch directions[5] issued by the PSO this year.

[5] The EMA's measures to secure and stabilise the power system and market include the Directed Supply Scheme (DSS) and Standby Capacity Scheme (SCS). Under the DSS, the PSO pre-emptively directs generation companies to generate using their own fuel (either diesel or gas), or gas from the Standby Liquefied Natural Gas Facility (SLF), in the event of a projected supply shortfall in the NEMS. Under the SCS, the EMA further procures standby generation capacity from participating generation licensees, and when required, the participating licensees will be called upon to increase generation supply in the NEMS to enhance power system security, reliability and stability, and mitigate price volatility.

MARKET MONITORING
SUPPLY INDICES: SUPPLY CUSHION

CHART 8: RELATIONSHIP BETWEEN SUPPLY CUSHION AND USEP IN 2025

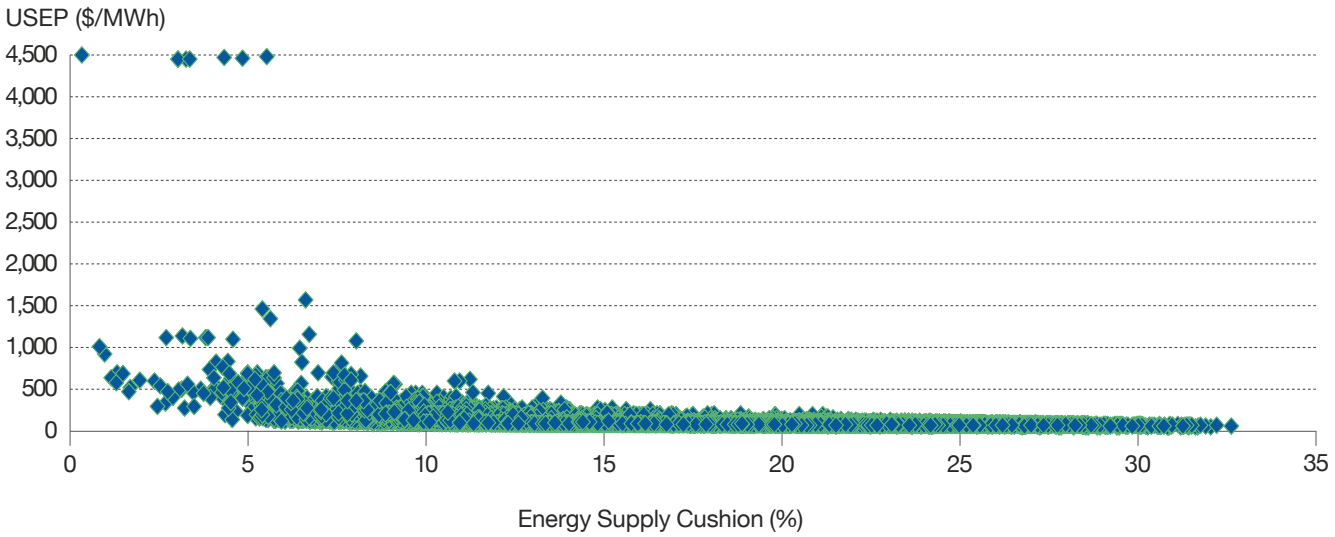


Chart 8 illustrates the relationship between USEP and supply cushion across all dispatch periods in 2025.

In 2025, USEP exceeded $1,000/MWh in 20 periods, a significant reduction from 99 periods in 2024. USEP also reached the price cap of $4,500/MWh for only one period in 2025, as compared to five such periods in 2024. Notably, there was no USEP recorded between $1,600/MWh and $4,400/MWh, underlining the reduced USEP volatility depicted in Chart 7. The majority of the USEP was concentrated below $750/MWh, resulting in a flatter overall price distribution compared to previous years.

At the one period in 2025 when USEP hit the price cap of $4,500/MWh, the supply cushion contracted to 0.34%, the lowest periodic level in the year. The supply was dragged down amidst relatively high planned outage and a CCGT forced outage on that day. Coupled with a rising demand on lower solar generation forecast while approaching sunset, the supply only narrowly fulfilled the demand. After taking into consideration the transmission losses, an energy shortfall was incurred so as to meet both the demand and the requirement from transmission loss.

TABLE 7: RELATIONSHIP BETWEEN SUPPLY CUSHION (%) AND USEP ($/MWH)

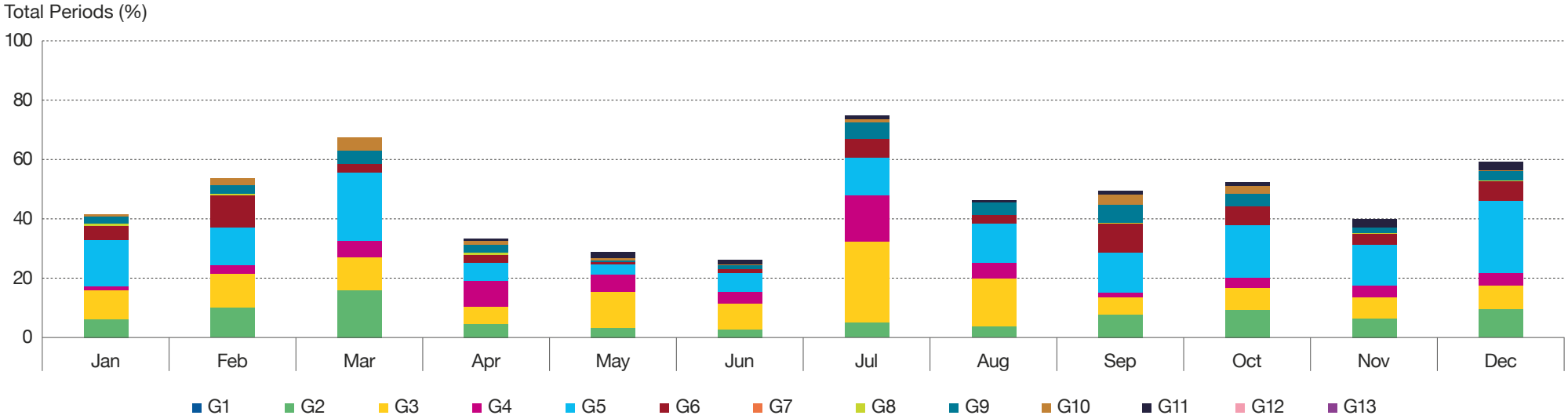
Year	Supply Cushion < 15%			Supply Cushion ≥ 15%		
	Number of Periods	Average USEP	Max USEP	Number of Periods	Average USEP	Max USEP
2021	1,713	623.76	4,499.09	15,807	150.01	3,007.35
2022	10,703	348.60	4,500.00	6,817	202.64	2,847.83
2023	13,722	282.95	4,500.00	3,798	119.25	436.39
2024	12,104	192.46	4,500.00	5,464	98.31	260.12
2025	7,039	150.17	4,500.00	10,481	94.01	273.82

Table 7 summarises the yearly average USEP movements with a supply cushion of less than, and greater than or equal to, the 15% level over the past five years.

The proportion of periods with a supply cushion below the 15% level fell to 40.18% of all periods in 2025. Correspondingly, the proportion of periods with a supply cushion greater than or equal to the 15% level expanded to 59.82% of all periods in 2025. This marked the first year since 2022, when the majority of periods in a year observed supply cushion levels greater than or equal to the 15% level. In 2025, the average USEP for both ranges of supply cushion levels decreased considerably compared to the past several years. These observations reflect greater overall price stability regardless of the supply conditions, which was in contrast with the past decade, when higher USEPs were typical under supply cushion levels below 15%.

MARKET MONITORING
SUPPLY INDICES: PRICE SETTER

CHART 9: TREND OF PRICE SETTING GENERATION COMPANIES



A price setter refers to a generation company that provides the block price-quantity pair fulfilling the marginal quantity required to meet total system demand.

Chart 9 illustrates the percentage of periods in each month during which a price setter was present. In 2025, this ranged from a low of 26.18% of the time in June to a high of 74.73% in July.

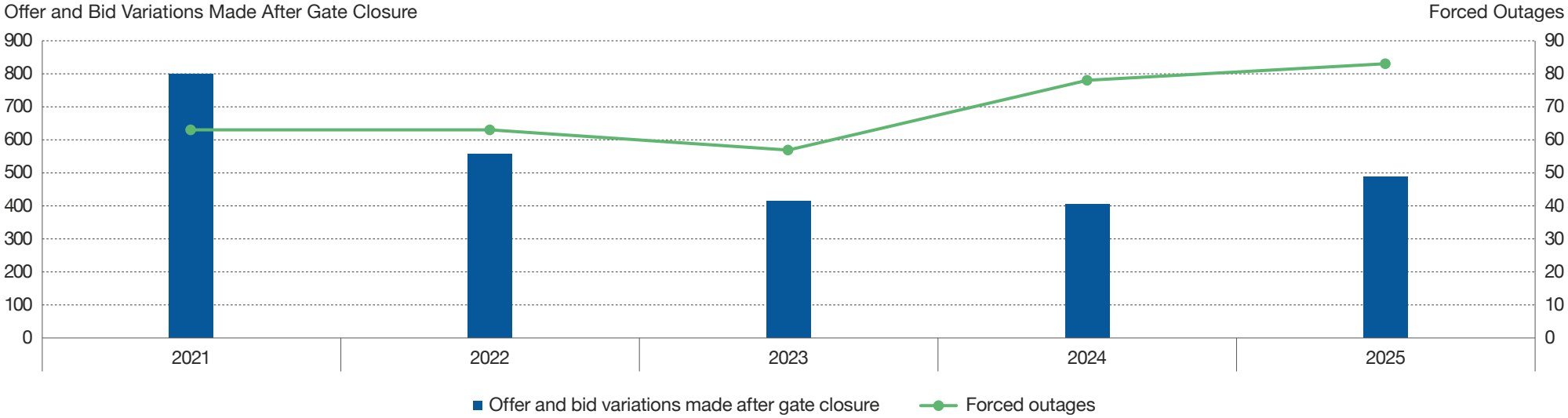
The three generation companies that most frequently identified as price setters in 2025 saw a shift from the previous year, with G2 replacing G4 among the top three, resulting in G2, G3 and G5 as the most frequent price setters in 2025, compared to G3, G4 and G5 in 2024. The top three price setters in 2025 accounted for 65.85% of all price-setter periods, up from 63.65% in 2024.

In 2025, G5 set the price in 13.50% of all periods in the year, up from 7.49% in 2024. G2 and G3 set the price in 7.10% and 10.93% of all periods in the year, compared to 7.05% and 15.85% in 2024.

On a monthly basis, G3 was identified as the most frequent price setter among the generation companies in 2025, setting the price in 27.08% of periods in July, followed by G5 at 24.19% in December. This was in contrast to 2024 when G5 set the price for 59.94% of all the periods in November 2024, marking a significant decline from the previous year.

MARKET MONITORING
SUPPLY INDICES: OFFER/BID VARIATIONS

CHART 10: OFFER AND BID VARIATIONS MADE AFTER GATE CLOSURE



In accordance with the Market Rules, offers and bids should be submitted at least 65 minutes before the actual trading period. Offer and bid variations made within the gate closure window of 65 minutes are tracked and regularly reported to the MSCP for investigation. No bid variations were submitted within the gate closure window in 2025.

Chart 10 compares the number of offer and bid variations made after gate closure from 2021 to 2025 against forced outage occurrences. Generally, the number of offer and bid variations made after gate closure trends with forced outages, although this pattern did not hold in 2022 and 2024.

In 2022, the number of offer and bid variations made after gate closure plunged from 799 in 2021 to 559, despite an insignificant increase in the forced outage occurrences. This corresponded to a rule change that was effected in 2022 to exempt Generation Registered Facilities (GRF) undergoing a fuel changeover directed by the PSO from the Automatic Financial Penalty Scheme (AFPS). For such cases, there was no need for a GRF to submit offer variations after gate closure, as they would no longer incur a penalty under the AFPS.

In 2024, the number of forced outages rose from 57 in 2023 to 78 in 2024. However, the number of offer and bid variations made after gate closure dipped from 414 in 2023 to 405 in 2024. This smaller number of offer and bid variations coincided with a lower frequency of dispatch directions issued by the PSO.

Specifically for this year, the number of offer and bid variations made after gate closure increased from 405 in 2024 to 488 in 2025, in line with the rise in the forced outage occurrences from 78 to 83.

MARKET MONITORING
SUPPLY INDICES: OFFER/BID VARIATIONS

CHART 11: SUBMISSION TIME OF OFFER AND BID VARIATIONS MADE WITHIN GATE CLOSURE

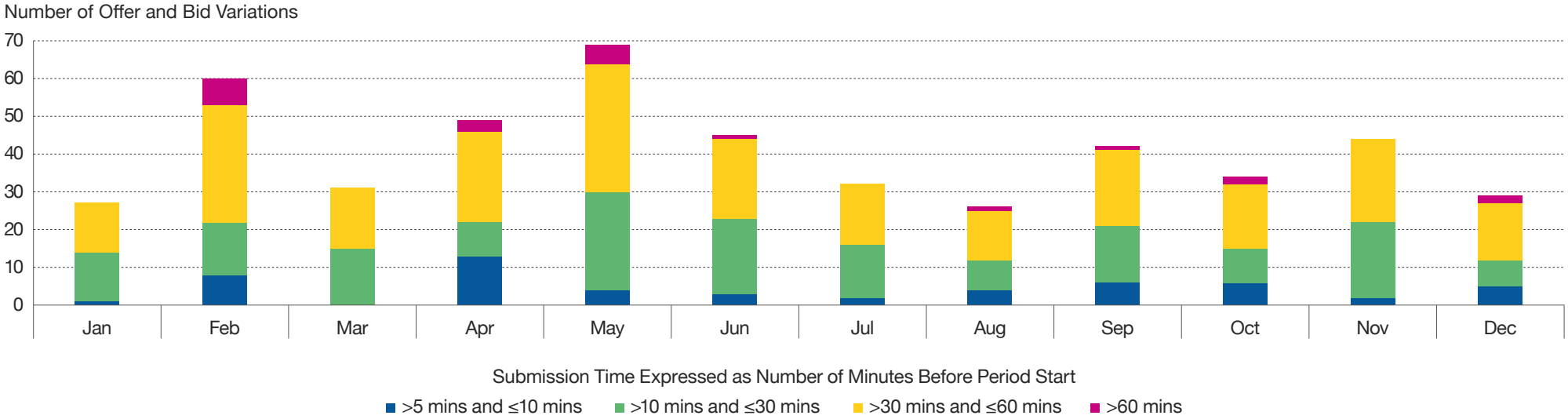


Chart 11 reflects the monthly offer and bid variations in 2025 submitted within the gate closure window or less than 65 minutes before the actual trading period, categorised by ranges of proximity of submission time to the actual trading period. No bid variations were submitted within the gate closure window in 2025.

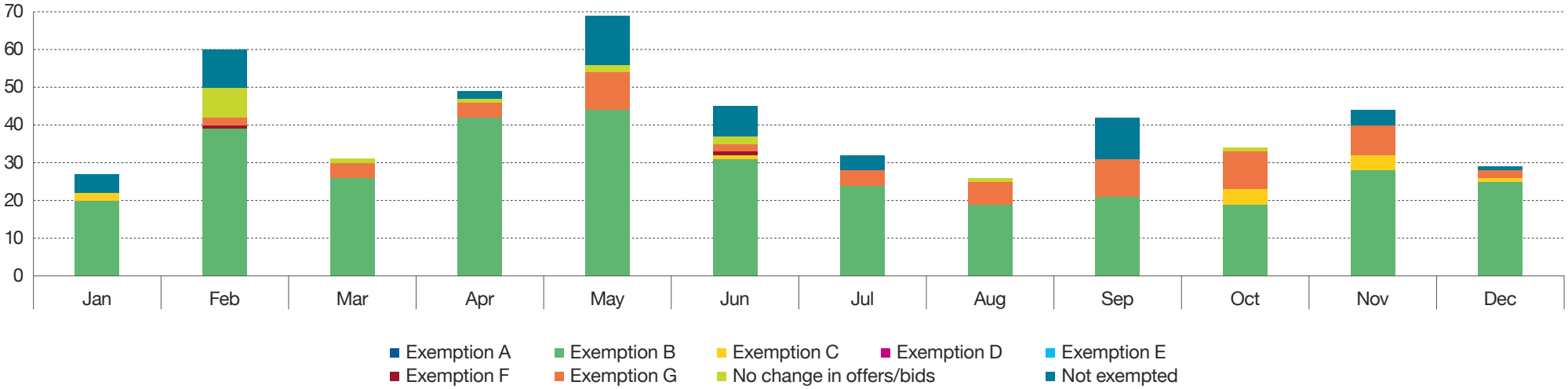
Compared to other months, February and May recorded notably higher number of offer variations within the gate closure window. In both months, most variations were driven by generation companies responding to forced outages and technical issues of the generation facilities.

Overall, 84.43% of these offer variations were submitted between ten minutes and 65 minutes before the trading period. While this was a drop from 91.11% in 2024, generation companies were generally still able to respond sufficiently before the start of the trading period.

MARKET MONITORING
SUPPLY INDICES: OFFER/BID VARIATIONS

CHART 12: CASES OF OFFER AND BID VARIATIONS MADE AFTER GATE CLOSURE

Number of Offer and Bid Variations Made After Gate Closure



Under sections 10.4.1 and 10.4.2 of Chapter 6 of the Market Rules, conditions have been set out as exemptions to the violation of the gate closure rules for registered facilities (refer to Box 1 for more details on exempted cases).

Chart 12 shows that of the 488 offer variation cases assessed by the MSCP in 2025, 414 were determined not to be in breach of the Market Rules as they fell under Exemptions A to G. An additional 16 cases were deemed non-breaches due to no changes in the offer submissions. Of the remaining 58 cases, nearly half (25 cases) were directed by the EMA and the PSO under the Directed Supply Scheme and were therefore also deemed to be non-breaches of the Market Rules.

Consistent with Chart 11, Chart 12 reflects a higher number of gate closure rule violations in February and May, particularly those exempted under Exemption B for Generation Registered Facilities. Notably, most of the offer variations were made in response to forced outages.

The MSCP determinations on the gate closure violation cases assessed by the panel are included in the State of Compliance within the Wholesale Electricity Market section of this report and have been published on the EMC website.

MARKET MONITORING
SUPPLY INDICES: OFFER/BID VARIATIONS

BOX 1. EXEMPTION CONDITIONS FOR CASES OF OFFER AND BID VARIATIONS MADE AFTER GATE CLOSURE

As provided by section 10.4.1 of Chapter 6 of the Market Rules, there are prescribed circumstances specified as exemptions for the assessment of offer variations made after gate closure, subjected to section 10.4.1.2. These exemptions are listed below:

Exemption A refers to section 10.4.1.1a. of Chapter 6 of the Market Rules, where an offer variation is intended for a generation registered facility, to reflect its expected ramp-up and ramp-down profiles during periods following synchronisation or preceding desynchronisation.

Exemption B refers to section 10.4.1.1b. of Chapter 6 of the Market Rules, where an offer variation is intended for a generation registered facility, to reflect its revised capability for the three consecutive dispatch periods immediately following a forced outage or its failure to synchronise.

Exemption C refers to section 10.4.1.1c. of Chapter 6 of the Market Rules, where an offer variation is intended for an import registered facility, to reflect its revised capability for the three consecutive dispatch periods immediately following a forced outage, including

(i) a forced outage of the interties connecting the import registered facility to the transmission system,

(ii) a forced outage or failure to synchronise of any constituent generating units in the interconnected system that form part of the import registered facility, or

(iii) a transmission constraint within the interconnected system.

Exemption D refers to section 10.4.1.1d. of Chapter 6 of the Market Rules, where an offer variation is intended to contribute positively to the resolution of an energy surplus situation pertaining to which Energy Market Company (EMC) has issued an advisory notice under section 9.3.1 of Chapter 6 of the Market Rules, by allowing for decreased supply of energy.

Exemption E refers to section 10.4.1.1e. of Chapter 6 of the Market Rules, where an offer variation is intended to contribute positively to the resolution of energy, reserve or regulation shortfall situations pertaining to which EMC has issued advisory notices under section 9.3.1 of Chapter 6 of the Market Rules, by allowing for increased supply of energy, reserve or regulation.

Exemption F refers to section 10.4.1.1f. of Chapter 6 of the Market Rules, where an offer variation is intended to contribute positively to the resolution of energy, reserve or regulation shortfall situations in that dispatch period, where:

(i) the shortfall situations were indicated in a system status advisory notice issued by EMC in respect of a high-risk operating state or emergency operating state declared by the Power System Operator (PSO); and

(ii) at the time of submission of such offer variation or revised standing offer, EMC has not yet withdrawn, in respect of that dispatch period, such system status advisory notice,

by allowing for increased supply of energy, reserve or regulation.

Exemption G refers to section 10.4.1.1g. of Chapter 6 of the Market Rules, where an offer variation is intended for a load registered facility, to reflect its revised capability during a forced outage or following a decrease in energy withdrawal under sections 9.3.3 and/or 9.3.4 of Chapter 5 of the Market Rules.

As provided by section 10.4.2 of Chapter 6 of the Market Rules, there are prescribed circumstances specified as exemptions for the assessment of bid variations made after gate closure, subjected to section 10.4.2.2. These exemptions are listed below:

Exemption A refers to section 10.4.2.1a. of Chapter 6 of the Market Rules, where a bid variation is intended for a load registered facility, to reflect its revised capability during a forced outage or following a decrease in energy withdrawal under sections 9.3.3 and/or 9.3.4 of Chapter 5 of the Market Rules.

Exemption B refers to section 10.4.2.1b. of Chapter 6 of the Market Rules, where a bid variation is intended to contribute positively to the resolution of energy shortfall situations pertaining to which EMC has issued advisory notices under section 9.3.1 of Chapter 6 of the Market Rules, by allowing for increased quantities in its energy bids.

Exemption C refers to section 10.4.2.1c. of Chapter 6 of the Market Rules, where a bid variation is intended to contribute positively to the resolution of energy shortfall situations in that dispatch period, where:

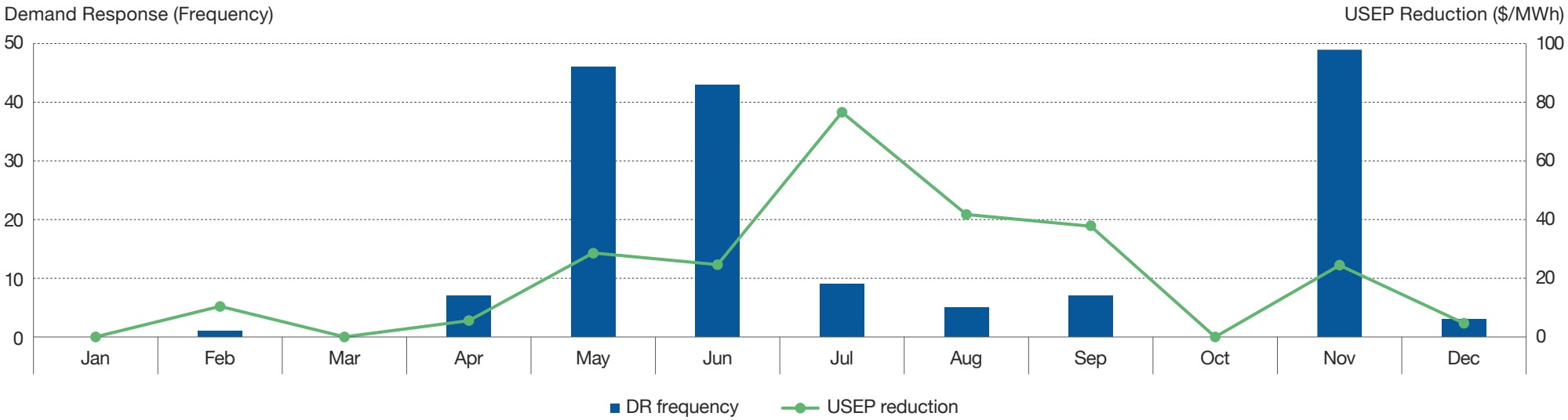
(i) the shortfall situations were indicated in a system status advisory notice issued by EMC in respect of a high-risk operating state or emergency operating state declared by the PSO; and

(ii) at the time of submission of such bid variation or revised standing bid, EMC has not yet withdrawn, in respect of that dispatch period, such system status advisory notice,

by allowing for increased quantities in its energy bids.

MARKET MONITORING
SUPPLY INDICES: DEMAND RESPONSE

CHART 13: DEMAND RESPONSE FREQUENCY VS USEP REDUCTION



The EMA introduced the Demand Response (DR) programme in 2016 to enhance competition in the wholesale electricity market, ensure a means to allow electricity demand to be met more effectively, and improve system reliability during periods of supply shortage. The DR programme provides contestable consumers with the opportunity to voluntarily curtail their electricity demand in exchange for a share in system-wide benefits, in particular, from the reduction in the wholesale electricity price.

Chart 13 illustrates the frequency of DR activations and the associated average reduction in USEP during periods with DR activations in 2025. The USEP reduction is calculated as the difference between the Counterfactual USEP (CUSEP)[6] and USEP, or between CUSEP and Reference USEP (RUSEP)[7] when the Temporary Price Cap (TPC)[8] is also activated.

In 2025, DR activations occurred in 170 periods, a sharp decline from 382 periods in 2024, consistent with the lower USEP levels recorded this year. Despite the year-on-year reduction in the number of DR activations, the frequency of bid submissions rose 0.42% to 473 periods this year.

The higher number of DR activations in May, June and November corresponded with the tighter supply cushion and higher number of energy bid submissions compared to the rest of the year. However, the average USEP reduction in these months was pushed down by several periods of small and insignificant USEP reduction. July, August and September observed a more robust supply cushion against a moderate number of energy bid submissions. There were multiple periods in these months, especially July, when the USEP reduction was among the highest in the year.

[6] CUSEP is calculated by the market clearing engine (MCE) with the assumption that there is no dispatchable energy bid, i.e. CUSEP is the price that would have cleared had there been no DR in that period.
[7] During periods when the TPC is activated, USEP is capped at the TPC energy price cap when the RUSEP is above the TPC energy price cap, i.e. RUSEP is the price that would have cleared if no energy price cap was imposed as a result of the TPC mechanism. From 1 July 2023, when the TPC mechanism was introduced, the RUSEP is used as a comparison to CUSEP so as to reflect the true contribution of DR in lowering prices.
[8] The TPC mechanism was introduced by the EMA on 1 July 2023. The TPC is designed to be activated during periods of high and sustained volatility in energy prices. Once activated, prices may be capped at a level pre-determined by the EMA. Once volatility returns to normal levels, the TPC is deactivated.

MARKET MONITORING
DEMAND INDICES: METERED ENERGY QUANTITY

CHART 14: COMPARISON OF ACTUAL DEMAND

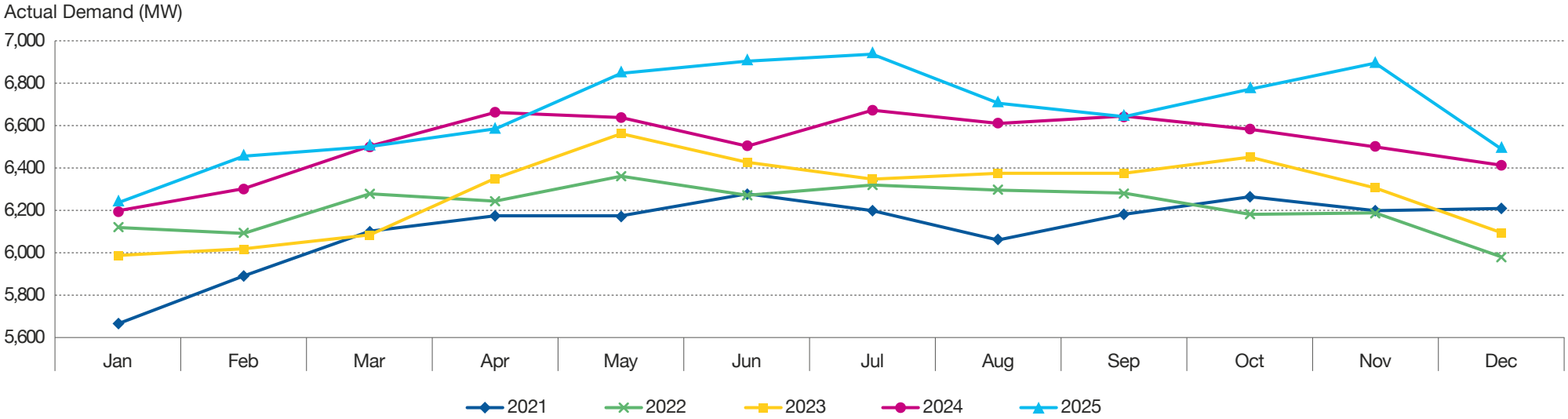


Chart 14 compares the actual demand over the years 2021 to 2025. Average demand for the year increased 2.25% from 6,519MW in 2024 to 6,666MW in 2025, setting a new record high.

Compared to the corresponding month in 2024, the average demand grew between 0.61% and 6.22% in all months of 2025, with the exception of March, April and September, reaching their highest monthly levels since the start of the NEMS. These changes were registered against the backdrop of mixed year-on-year movements in temperatures and manufacturing activity levels. In contrast, the demand contracted by 0.02%, 1.15% and 0.01% in March, April and September respectively, coinciding with year-on-year lower average temperatures and manufacturing activity levels.

On a month-on-month comparison, the average demand climbed between 0.47% and 4.01% in all months of 2025, except decreasing 3.35%, 0.92% and 5.89% in August, September and December respectively. Similar to the year-on-year trends, the month-on-month variations in temperatures and manufacturing activity levels were mixed.

Comparing the first half to the second half of the year, in spite of a slightly lower average temperature, the increase in the average demand was supported by an expansion in the manufacturing economy for most months in the second half of the year. The average demand rose steadily from 6,238MW in January to 6,500MW in March. Thereafter, it consistently exceeded 6,500MW each month before slipping to 6,489MW in December. The highest average demand was recorded in July at 6,938MW when the average temperature was the third highest in the year. The lowest average demand occurred in January at 6,238MW, corresponding with the lowest average temperature in the year.

MARKET MONITORING

DEMAND INDICES: METERED ENERGY QUANTITY AND SOLAR GENERATION

CHART 15: ACTUAL DEMAND VS SOLAR GENERATION

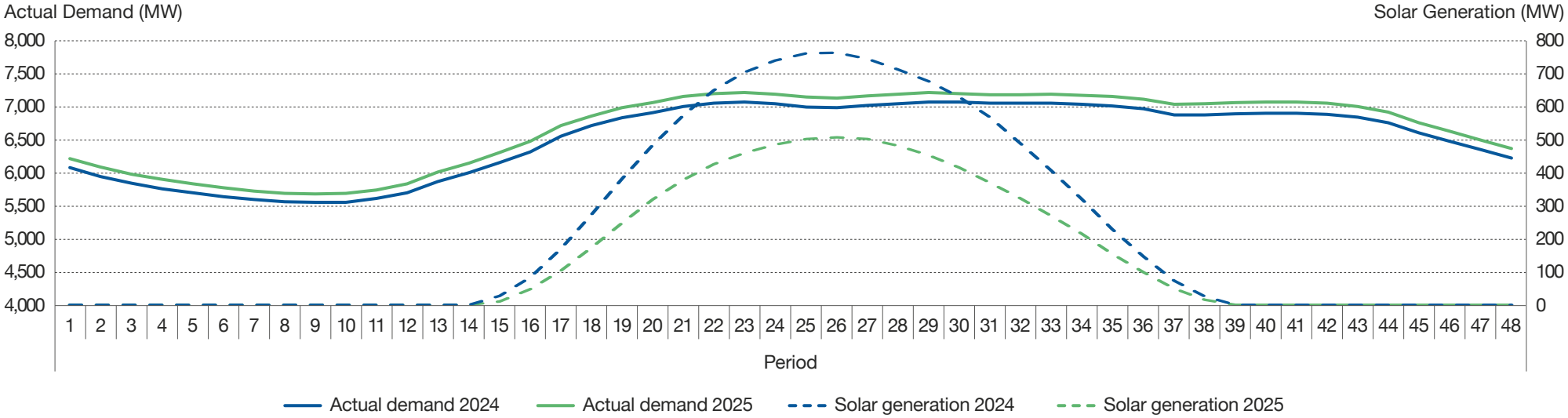


Chart 15 shows the periodic average profile of actual demand and solar generation for 2024 and 2025.

Similar to 2024, the introduction of solar generation and its increasing contribution to the market in recent years has resulted in the peak of the demand profile flattening overall, as well as exhibiting a dip during the midday period. In 2025, as solar generation rose steadily to peak in period 26, the actual demand fell gradually between periods 24 and 26.

Nonetheless, from 2024 to 2025, the actual demand periodic profile continued to move upwards. At the same time, the solar generation periodic profile also advanced during the daylight hours, with its growth more pronounced during the midday period. The highest average actual demand shifted from 7,073MW in period 29 to 7,211MW in period 23. While the highest average solar generation remained in period 26, it rose considerably from 506MW to 762MW. As the actual demand reflects the net consumption after accounting for solar generation, the rising average actual demand and solar generation underscored a higher overall total consumption.

MARKET MONITORING

DEMAND INDICES: ACCURACY OF PRE-DISPATCH, SHORT-TERM AND REAL-TIME LOAD FORECASTS

TABLE 8: VARIATION IN LOAD FORECAST

Year	Variation between PDS & Real-time		Variation between STS & Real-time	
	Mean (MW)	Standard Deviation (MW)	Mean (MW)	Standard Deviation (MW)
2021	75.33	49.72	20.86	13.55
2022	61.58	42.58	17.41	14.22
2023	53.85	44.03	14.96	12.12
2024	54.09	46.26	15.05	12.69
2025	61.78	48.43	16.43	13.29

Note: The mean (MW) and the standard deviation (MW) are calculated in absolute terms.

Accurate load forecasting is essential for generating real-time dispatch and pricing schedules, ensuring efficient pricing outcomes and system stability. In the National Electricity Market of Singapore (NEMS), three forecast schedules with varying forecast horizons are provided to market participants: the Market Outlook Scenario (MOS), the Pre-dispatch Schedule (PDS), and the Short-term Schedule (STS). The MOS is updated daily with a six-day forecast horizon. The PDS is updated every two hours with a forecast horizon of 12 to 36 hours. The STS, updated every half hour, has a shorter forecast horizon of six hours.

Table 8 details the accuracy of the PDS and STS forecasts from 2021 to 2025, measured by the means and standard deviations of the load variations (in absolute terms). As the STS is updated more frequently and closer to the real-time dispatch period, it typically exhibits smaller load variations from the real-time dispatch schedule than the PDS.

In 2025, the mean and standard deviation of the load variation for the STS continued to be significantly smaller than those for the PDS, demonstrating the higher accuracy of the STS compared to the PDS as expected. The mean load variation for the PDS was 61.78MW, which was 3.76 times as large as 16.43MW for the STS. Similarly, the standard deviation of the load variation for the PDS was 48.43MW, 3.64 times as large as 13.29MW for the STS.

However, for both the PDS and STS, the mean and standard deviation of the load variation grew for the second straight year, indicating a year-on-year decrease in forecasting accuracy. From 2024 to 2025, the mean load variation for the PDS and STS increased 14.22% and 9.16% respectively. The standard deviation of the load variation for the PDS and STS rose 4.69% and 4.70% respectively. Notably in 2025, the mean and standard deviation of the load variation for the PDS were the highest since 2022, while those for the STS were the highest since 2023.

TABLE 9: VARIATION IN REAL-TIME LOAD FORECAST (%)

Year	Variation between Real-time Load Forecast & Actual Demand	YOY Change
2021	1.72	-0.44
2022	1.48	-0.23
2023	0.94	-0.54
2024	0.44	-0.53
2025	1.28	0.84

The accuracy of the load forecast used in real-time dispatch schedules is critical, as it directly influences dispatch instructions and market prices. An accurate load forecast ensures that dispatch instructions and market prices align closely with actual system conditions, thereby contributing to system stability and optimised pricing outcomes. Maintaining a precise load forecast is therefore essential for the efficient operation of the market.

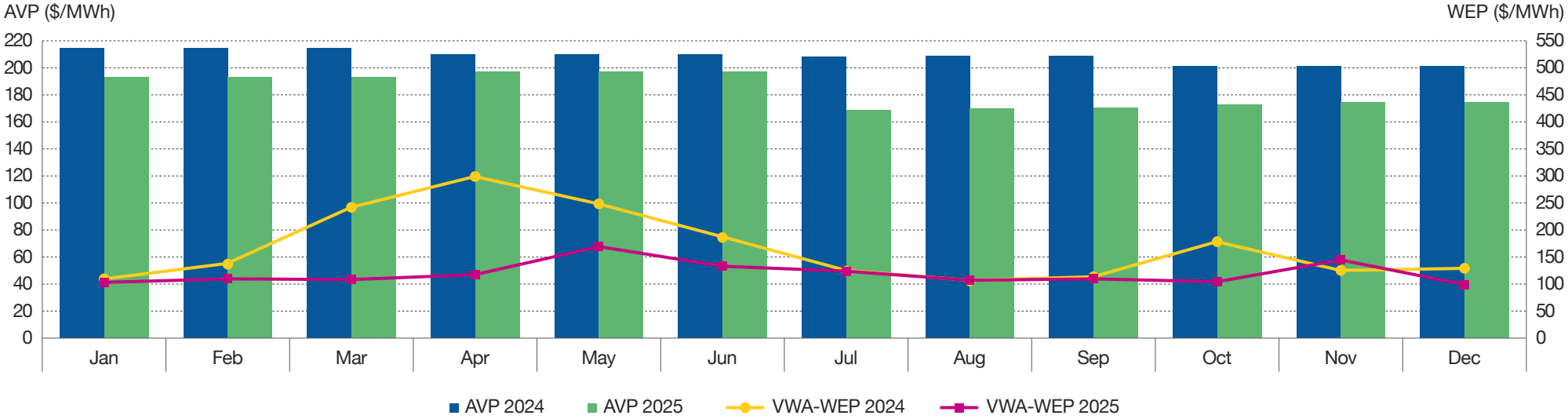
A slight variance between the real-time load forecast and the actual demand is inevitable due to several factors. For instance, the real-time load forecast includes station and auxiliary loads, while the metered energy quantity, based on settlement data provided by the Market Support Services Licensee (MSSL), excludes these components. This methodological difference results in the real-time load forecast typically being higher than the actual demand. Additional contributors to this variance include metering errors and transmission losses.

Table 9 highlights the variation between the real-time load forecast and actual demand, indicating the average load forecast deviation over the past five years. In general, a lower deviation corresponds to more precise load predictions, which is essential for effective market operations. The variation between the real-time load forecast and actual demand widened by 0.84 percentage point from the smallest variation recorded since market start of 0.44% in 2024, to a three-year high of 1.28% in 2025. This also marks the first year of increased variation following six consecutive years of decline, as well as the largest yearly growth in variation since the start of the NEMS. Nonetheless, the variation has remained well below 2.00% since 2021.

MARKET MONITORING

PRICE INDICES: ANNUAL VESTING PRICE AND WHOLESALE ELECTRICITY PRICE

CHART 16: AVP VS MONTHLY VOLUME-WEIGHTED AVERAGE WEP (VWA-WEP)



To address the volatility in the prices over the past few years, the EMA implemented the vesting regime framework[9] effective from 1 July 2023 to 30 June 2028. This framework enables the EMA to issue vesting contracts through the Market Support Services Licensee (MSSL) to hedge energy prices in the Singapore Wholesale Electricity Market (SWEM). It serves to mitigate extreme price fluctuations and includes a five-year vesting regime with three schemes: the Base Vesting Scheme, Tender Vesting Scheme, and Residual Vesting Scheme.

Chart 16 illustrates the Annual Vesting Price (AVP) and the monthly volume-weighted average Wholesale Electricity Price (WEP) for 2024 and 2025. In an efficient market, the WEP is expected to closely align with the AVP, which represents the long-run marginal cost of a generation facility. A divergence between the WEP and the AVP is likely influenced by market price volatility, which is in turn driven by factors such as constrained supply, weather fluctuations, and rising fuel costs.

In 2025, the volume-weighted average WEP was lower than 2024 for all months except November. This trend occurred in the context of lower WEP compared to the previous year for all months except August and November. This was largely in line with the lower year-on-year temperature and fuel oil price for eight months in the year, and higher year-on-year supply cushion for all months in the year. In addition, the AVP declined considerably since July, ranging between $192.91/MWh and $197.09/MWh from January to June, to between $168.38/MWh and $174.23/MWh from July onwards. This coincided with the range of monthly fuel oil price shifting downwards, ranging between US$425.71/MT and US$486.74/MT in the first half of the year, to between US$343.17/MT and US$418.33/MT in the second half of the year.

Compared to the AVP, the volume-weighted average WEP fell below the AVP for nine months of 2024 by a range of $22.91/MWh to $104.70/MWh, while exceeding the AVP for the remaining three months that year by a range of $27.28/MWh to $89.38/MWh. In contrast, the volume-weighted average WEP was below the AVP for all months of 2025 by a range of $28.46/MWh to $90.46/MWh. Overall, the annual volume-weighted average WEP fell 28.81% from $166.64/MWh in 2024 to $118.64/MWh in 2025. The AVP fell 12.11% from $208.43/MWh in 2024 to $183.18/MWh in 2025. As a result, the annual volume-weighted average WEP was 35.23% lower than the yearly average AVP in 2025, compared to being 20.05% lower than the yearly average AVP in 2024.

[9] EMA | Vesting Contracts

MARKET MONITORING

PRICE INDICES: CORRELATION BETWEEN AVP, WEP, FUEL OIL PRICE AND ELECTRICITY TARIFF

CHART 17: INDEX OF AVP, WEP, FUEL OIL PRICE AND ELECTRICITY TARIFF

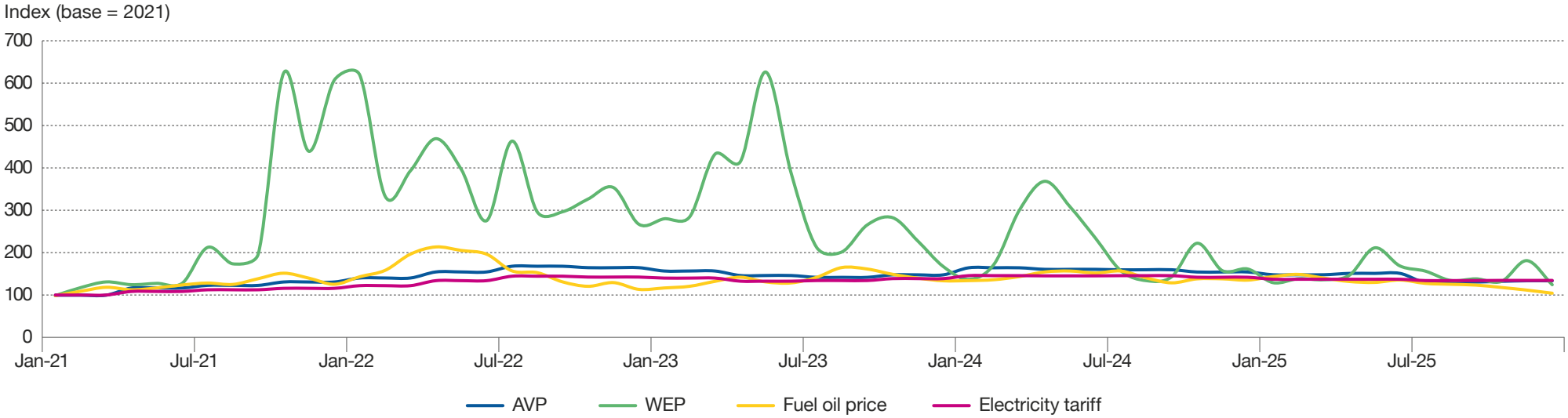


Chart 17 presents the indices of fuel oil price, Annual Vesting Price (AVP), Wholesale Electricity Price (WEP), and electricity tariff over the past five years, with 2021 as the base year. The chart highlights the relative changes in these indices and their correlations during this period.

Over the past five years, the fuel oil price, AVP and electricity tariff moved largely in tandem. In contrast, the WEP displayed heightened volatility between July 2021 and June 2023, likely driven by tighter supply conditions and more frequent gas curtailment. Following the implementation of the Temporary Price Cap (TPC) in July 2023, which was designed to mitigate sustained high prices, the WEP stabilised. The moderately higher WEP levels between March 2024 and May 2024 were due to a tighter supply cushion, warmer weather, and higher fuel costs compared to most other months of the year.

In 2025, the WEP further eased and closely tracked the fuel oil price, AVP and electricity tariff in most months of the year. At the monthly average level, the WEP peaked in May, which marked the second highest temperature, the fourth highest actual demand, and the lowest supply cushion in the year. This was followed by the second highest WEP in November, which coincided with the third highest actual demand in the year.

On an annual basis, in line with the fuel oil price dropping 10.30% to US$420.08/MT in 2025, the WEP declined 27.80% to $117.78/MWh while the yearly average electricity tariff fell 6.24% to $0.30/kWh.

MARKET MONITORING

PRICE INDICES: CORRELATION BETWEEN WEP AND METERED ENERGY QUANTITY

TABLE 10: MONTHLY AVERAGE CORRELATION COEFFICIENT OF WEP AND METERED ENERGY QUANTITY

Month	2024			2025		
	Correlation Coefficient, *r*	r^2	Number of Days With *r*>0.5	Correlation Coefficient, *r*	r^2	Number of Days With *r*>0.5
Jan	0.74	0.57	27	0.41	0.24	10
Feb	0.54	0.32	19	0.12	0.12	1
Mar	0.58	0.35	20	0.27	0.13	5
Apr	0.63	0.42	22	0.44	0.22	14
May	0.59	0.39	22	0.33	0.14	6
Jun	0.52	0.33	16	0.15	0.08	3
Jul	0.27	0.12	3	0.29	0.12	3
Aug	0.41	0.23	15	0.15	0.07	1
Sep	0.41	0.20	8	0.25	0.12	2
Oct	0.46	0.23	11	0.21	0.07	0
Nov	0.54	0.31	19	0.16	0.06	0
Dec	0.42	0.20	7	0.17	0.10	4
Average/Sum	**0.51**	**0.31**	**189**	**0.25**	**0.12**	**49**

Table 10 presents the correlation coefficient (*r*), which measures the strength and direction of the relationship between the WEP and the metered energy quantity over time. The correlation coefficient ranges from -1 to 1, where a positive value indicates a direct relationship between the variables (e.g., higher demand leads to higher WEP), and a negative value signifies an inverse relationship (e.g., higher demand leads to lower WEP). The closer the *r* value is to -1 or 1, the stronger the correlation. Additionally, the square of the correlation coefficient (r^2) represents the proportion of WEP variance attributable to variations in demand.

In 2025, the monthly correlation coefficient (*r*) ranged from 0.12 to 0.44, narrowing from the range of 0.27 to 0.74 observed in 2024. Year-on-year, the *r* value declined in all months, except for an uptick in July. Similarly, the r^2 value and the number of days where *r* exceeded 0.5 fell in all months, except remaining unchanged in July.

On an annual basis, the average *r* value sank from 0.51 in 2024 to 0.25 in 2025. In addition, the number of days where *r* exceeded 0.5 was reduced from 189 days in 2024 to 49 days in 2025. The r^2 value also decreased from 0.31 in 2024 to 0.12 in 2025, indicating that only 12.18% of the variance in the WEP in 2025 could be explained by demand variations as compared to 30.69% in 2024. These trends suggested a weaker overall correlation between the WEP and metered energy quantity in 2025, with fewer days when both variables exhibited strong positive movement in tandem.

MARKET MONITORING

PRICE INDICES: CORRELATION BETWEEN WEP AND METERED ENERGY QUANTITY

CHART 18: CORRELATION BETWEEN WEP AND METERED ENERGY QUANTITY IN 2025

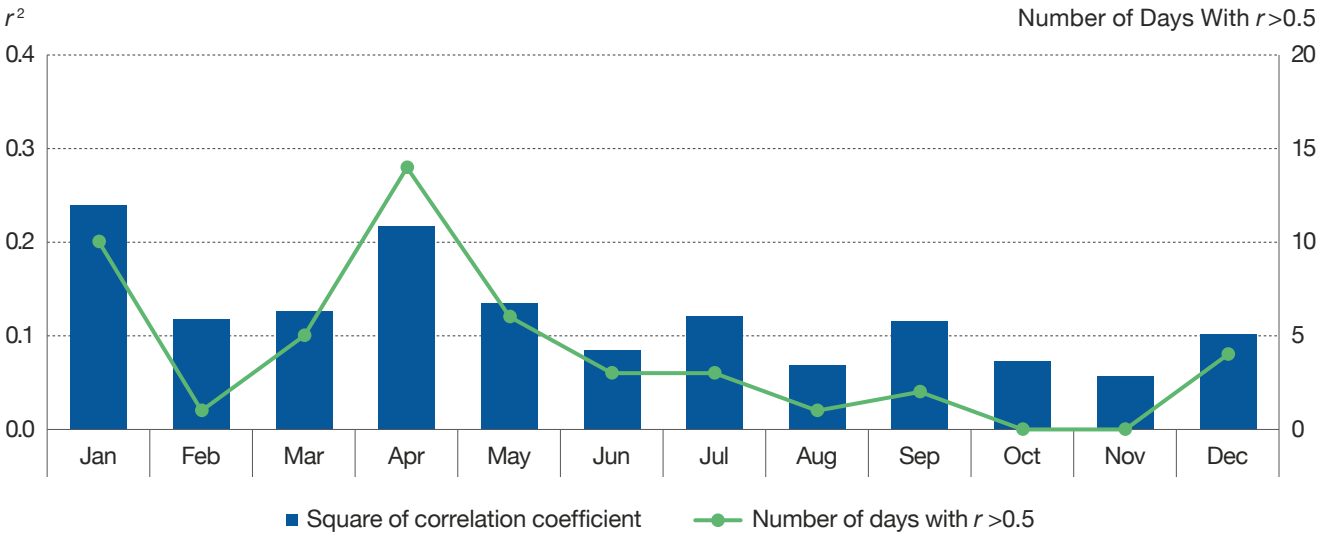


Chart 18 illustrates the correlation between the monthly WEP and the metered energy quantity in 2025. Generally, the r^2 value tends to correlate positively with the number of days when the correlation coefficient (r) exceeds 0.5, indicating a stronger relationship between the two variables on those days.

In 2025, the r^2 values were well below 0.50 for all months, specifically below 0.30 for all months, with no more than 14 days in any month showing an r value greater than 0.5. The highest r^2 value recorded was 0.24 in January when merely ten out of 31 days showed an r value greater than 0.5. The lowest r^2 value was 0.06 in November, followed by 0.07 in August and October. In particular, October and November registered zero days with an r value greater than 0.5. This weak correlation suggests that the impact of demand on the WEP was likely dampened by other factors such as fuel oil prices, generator outages, supply cushion and market interventions by the EMA.

CHART 19: CORRELATION BETWEEN WEP AND METERED ENERGY QUANTITY FOR 2021–2025

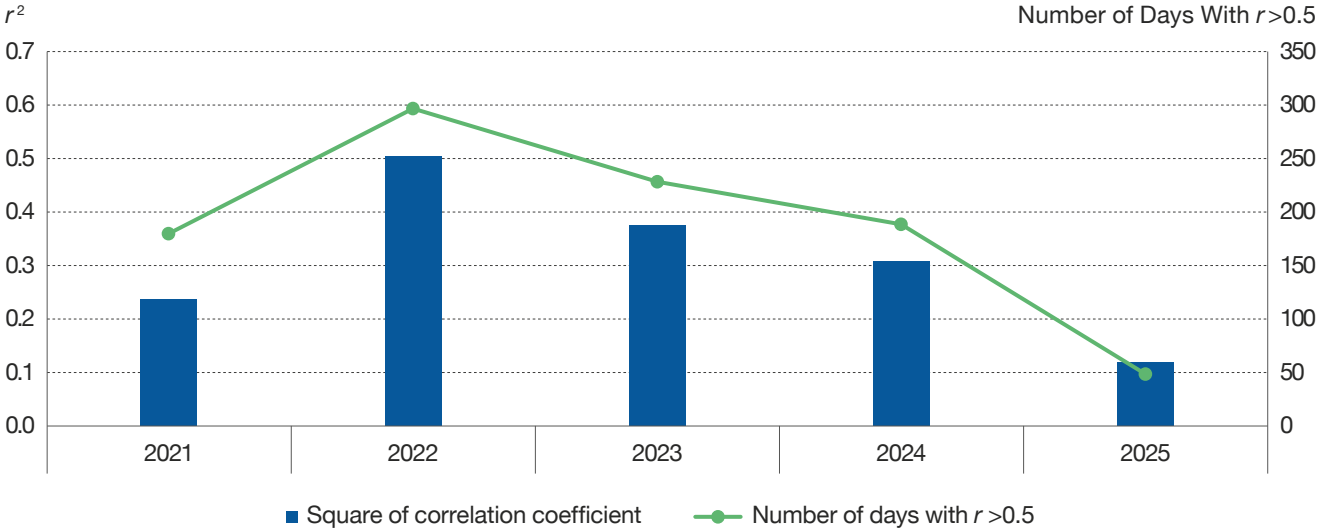


Chart 19 presents the correlation between the WEP and the metered energy quantity from 2021 to 2025. Over this period, the r^2 value, which is the proportion of WEP variance attributable to variations in demand, corresponded with the number of days with an r value greater than 0.5.

This is the third consecutive year of a weakening relationship between demand and energy prices, whereby the fluctuations in energy prices were likely influenced by major events such as the gas curtailments in 2021 and 2022, and the implementation of the TPC in 2023. In 2022, the number of days with an r value above 0.5 improved to 297 days from 180 days in 2021. Thereafter, the number of such days declined in each year, reaching 228 days in 2023, 189 days in 2024 and 49 days in 2025. Correspondingly, the r^2 value improved from 0.24 in 2021 to 0.50 in 2022, and then gradually fell to 0.38 in 2023, 0.31 in 2024 and 0.12 in 2025. It is noteworthy that the r^2 value and the number of days with an r value greater than 0.5 in 2025 reached their respective lowest levels since the start of the NEMS.

Note: Due to a change in methodology, the trend of correlation between WEP and metered energy quantity since 2023 has been revised.

MARKET MONITORING

PRICE INDICES: FREQUENCY DISTRIBUTION OF WEP BY (A) PERCENTAGE OF HOURS OF OCCURRENCE AND (B) PERCENTAGE OF ENERGY QUANTITY AFFECTED

CHART 20: PERCENTAGE OF HOURS WHEN THE WEP FALLS INTO A PARTICULAR PRICE RANGE

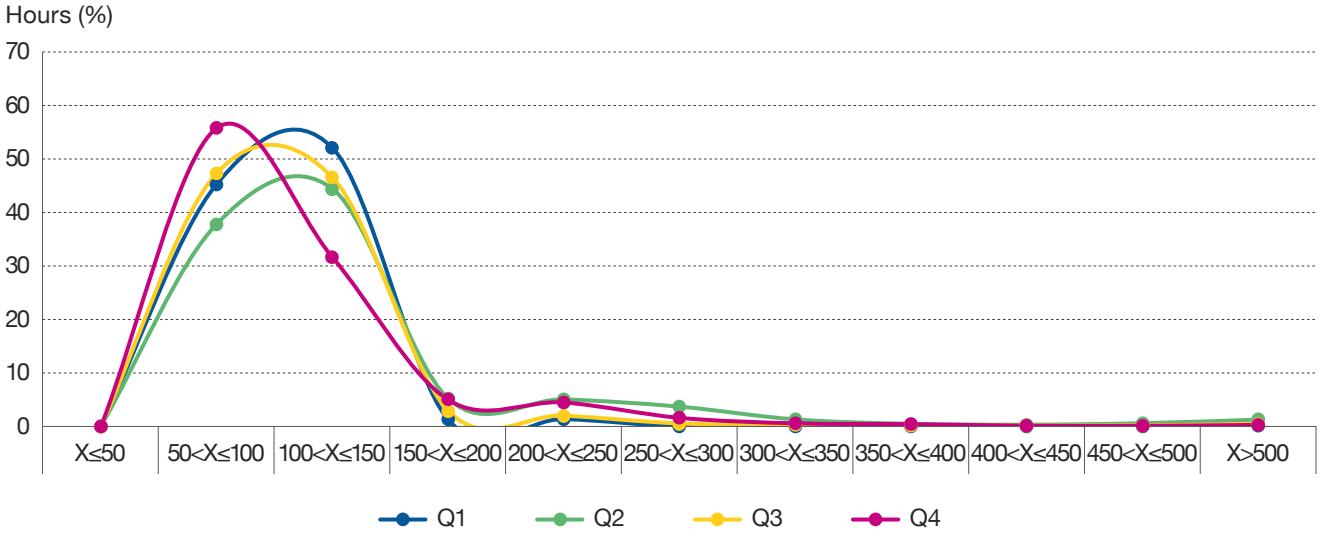


CHART 21: PERCENTAGE OF ENERGY QUANTITY WHEN THE WEP FALLS INTO A PARTICULAR PRICE RANGE

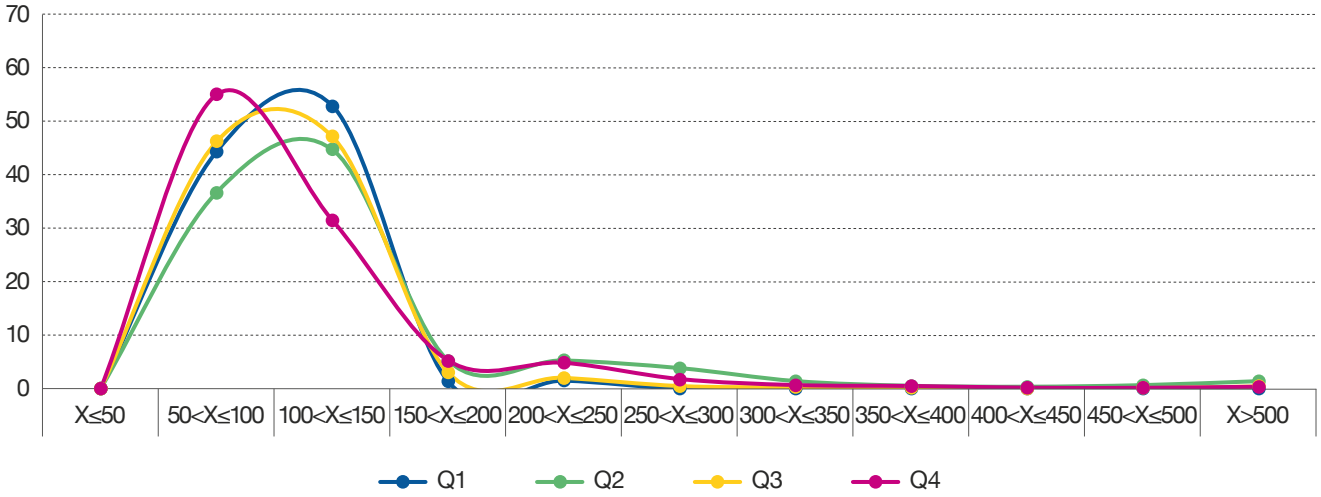


Chart 20 illustrates the distribution of the WEP across different price ranges, represented as a percentage of the total hours in each quarter of 2025. In Q1 and Q2, while the WEP distribution peaked in the $100/MWh to $150/MWh range, the percentage of distribution in this price range contracted from 52.01% in Q1 to 44.35% in Q2. The peak of the WEP distribution shifted to the $50/MWh to $100/MWh range in Q3, making up 47.26% of the total hours in Q3. The percentage of distribution in the $50/MWh to $100/MWh range continued to grow in Q4, registering 55.75%. These movements in the WEP distribution corresponded with a higher supply cushion on a quarter-on-quarter basis, with the exception of Q2, which could be attributed to an increase in the proportion of lower-priced energy offers from Q1. Across all quarters, the maximum WEP distribution of 55.75% occurred in the $50/MWh to $100/MWh range in Q4, which was bolstered by the highest quarterly supply cushion in the year.

Chart 21 presents the frequency of the WEP in various price ranges, expressed as a percentage of the total metered energy quantity for each quarter of 2025. The trend of the WEP distribution largely mirrored that in Chart 20. Similar to the WEP distribution by percentage of hours, the WEP distribution by percentage of total metered energy quantity reached the maximum in the $100/MWh to $150/MWh range in Q1 and Q2, at 52.82% and 44.70% respectively. However, unlike Chart 20, the peak of the distribution persisted in the $100/MWh to $150/MWh range in Q3, surpassing the first two quarters with a share of 47.14%. In Q4, the peak of the distribution shifted to the $50/MWh to $100/MWh range, associated with 54.98% of the total metered energy quantity. Similar to the WEP distribution by percentage of hours, this was also the highest concentration among all quarters. Overall, this implied more periods and greater quantities of energy being cleared within a lower price range in Q4.

MARKET MONITORING

PRICE INDICES: FREQUENCY DISTRIBUTION OF WEP BY (A) PERCENTAGE OF HOURS OF OCCURRENCE AND (B) PERCENTAGE OF ENERGY QUANTITY AFFECTED

CHART 22: PERCENTAGE OF HOURS WHEN THE WEP FALLS INTO A PARTICULAR PRICE RANGE

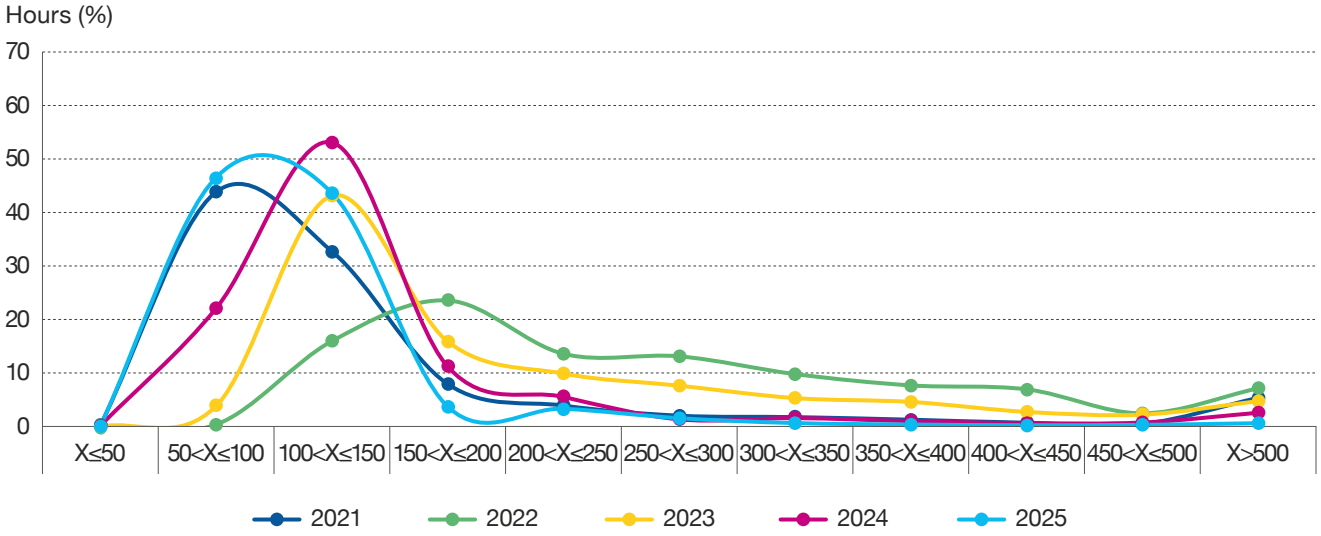


CHART 23: PERCENTAGE OF ENERGY QUANTITY WHEN THE WEP FALLS INTO A PARTICULAR PRICE RANGE

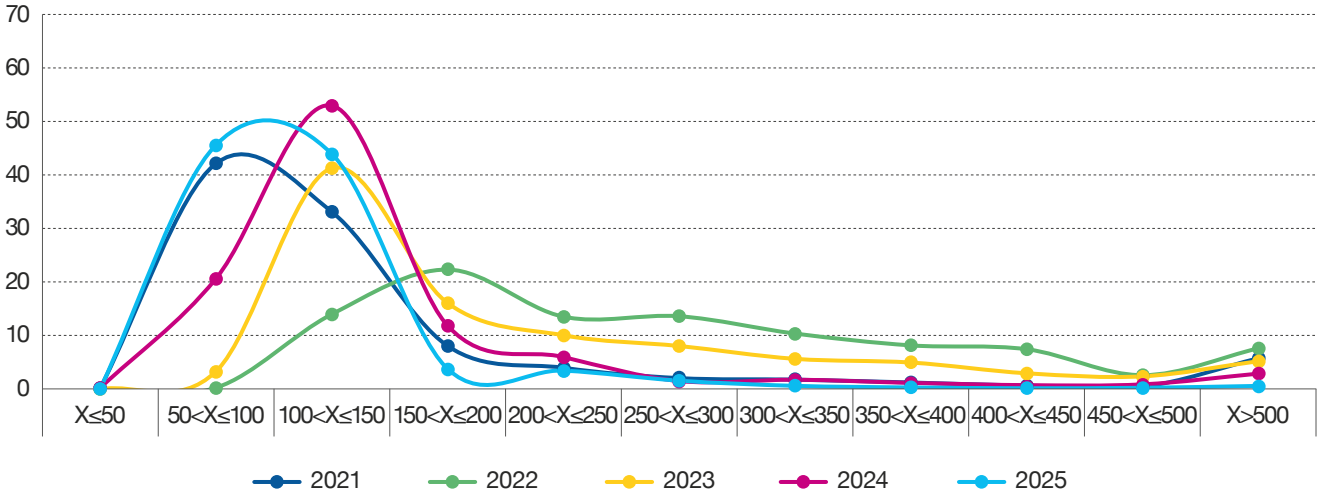


Chart 22 displays the historical price distribution over the past five years, expressed as a percentage of the total number of hours in each year, to assess longer-term trends.

From 2021 to 2025, the peak of WEP distribution shifted considerably. Prior to the peak of the distribution in 2025 reverting to the $50/MWh to $100/MWh range observed in 2021, this peak distribution occurred within higher price ranges in the last few years, namely in the $150/MWh to $200/MWh range in 2022, and the $100/MWh to $150/MWh range in 2023 and 2024. In addition, the WEP settled in the $50/MWh to $100/MWh range for 46.54% of the time in 2025, which was more frequent than 43.81% of the time in 2021. This was corroborated by the WEP averaging at a five-year low of $117.78/MWh in 2025, followed by the second lowest WEP of $195.62/MWh in 2021 over the last five years. Compared to 2024, the largest percentage changes in the distribution in 2025 were recorded in the $50/MWh to $100/MWh range and the $100/MWh to $150/MWh range, increasing by 24.42 percentage points and decreasing by 9.48 percentage points respectively. Notably, the frequency of energy being cleared within the higher price ranges, primarily from the $250/MWh level and above, diminished significantly since 2023.

Chart 23 shows the historical price distribution for the past five years, based on the percentage of total metered energy quantity. Amidst increasing total metered energy quantity year-on-year from 2021 to 2025, the behaviour of the price distribution by energy quantity continued to trend with that in Chart 22, which was underlined by the higher frequency and greater volume of energy being cleared within the lower price range of $50/MWh to $100/MWh in 2025.

MARKET MONITORING
ANCILLARY SERVICE INDICES: RESERVE PRICES

CHART 24: PRIMARY RESERVE PRICE

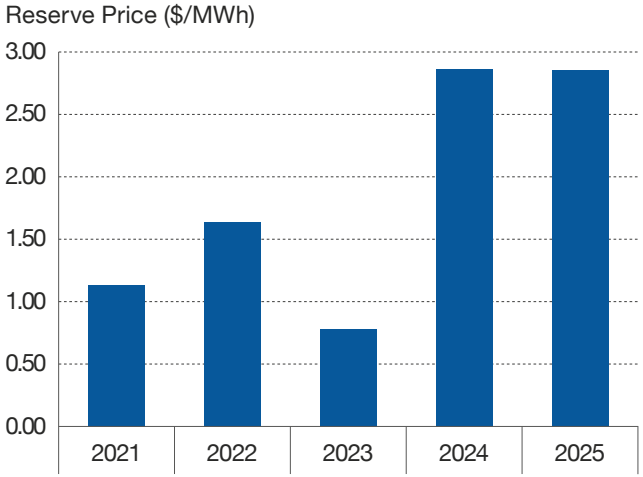


Chart 24 illustrates the average primary reserve price in the NEMS from 2021 to 2025.

Each registered facility offering primary reserve in the NEMS must be capable of achieving its scheduled megawatt response automatically without further instruction from the PSO within nine seconds of being triggered by any contingency event and maintaining that scheduled megawatt response for ten minutes from the time it was triggered[10].

Between 2024 and 2025, the average primary reserve requirement increased 2.56% to 175MW. Meanwhile, the average primary reserve price dipped slightly from $2.86/MWh in 2024 to $2.85/MWh in 2025, the second-highest level since 2008. The decline in primary reserve price could be attributed to a greater proportion of primary reserve offers shifting towards the lower offer price bands. This outweighed the impact of a higher requirement and a lower total primary reserve offer quantity in the market.

While there was no primary reserve shortfall in 2024, three periods of primary reserve shortfall were recorded across two days in 2025. In particular, this was the first year with a primary reserve shortfall since 2023. The shortfalls on those two days were mainly attributed to the tight supply cushion condition arising from higher outage levels.

CHART 25: CONTINGENCY RESERVE PRICE

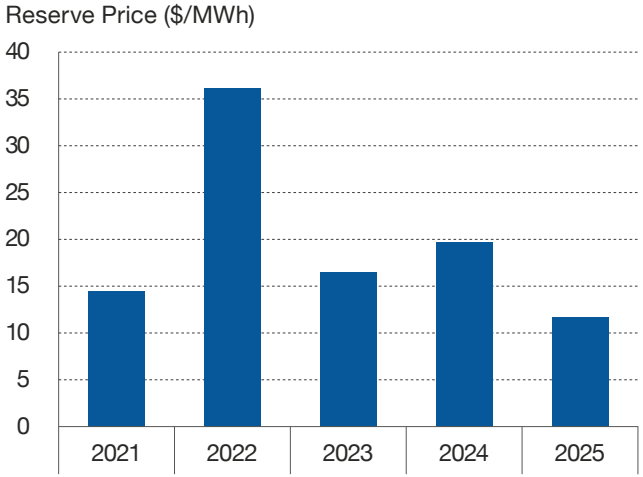


Chart 25 illustrates the average contingency reserve price in the NEMS from 2021 to 2025.

Each registered facility offering contingency reserve must be capable of achieving its scheduled megawatt response within ten minutes of being instructed to do so and maintain its scheduled megawatt response for a minimum of 30 minutes[11].

In 2022, the average contingency reserve price increased to $36.11/MWh, the highest level since market start. This was attributed to the frequency of contingency reserve shortfall hitting a historic high of 680 periods amidst the tight supply cushion in 2022, more than ten times that of 2021. In 2023, the contingency reserve price declined 54.28% to $16.51/MWh, due to a 20.34% lower requirement and a drastic drop in the frequency of periods with contingency reserve shortfall to 81 periods.

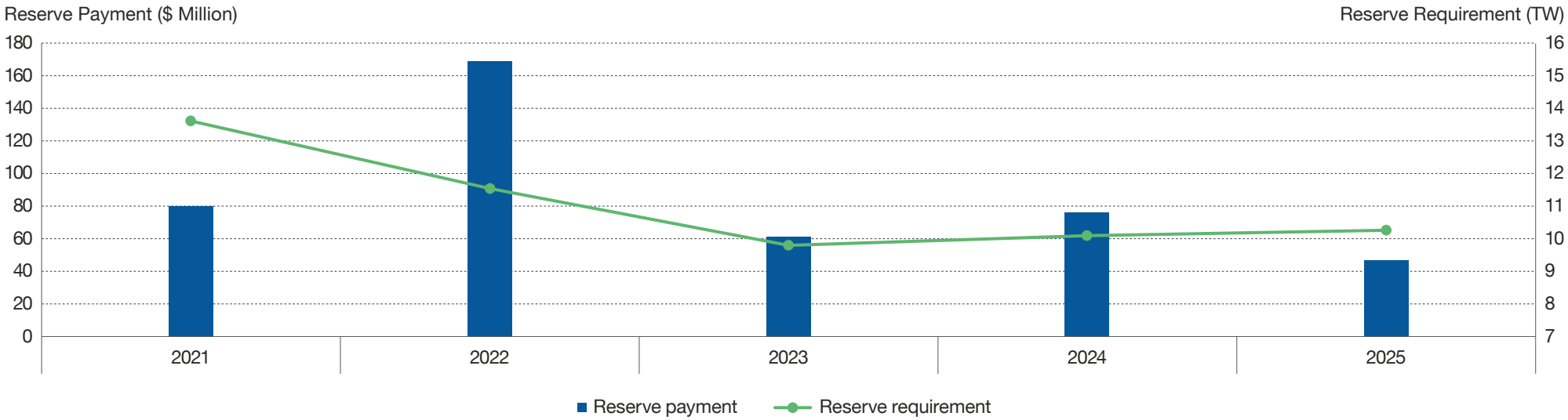
Contingency reserve price picked up in 2024 to $19.70/MWh, a 19.29% rise from the previous year, despite the occurrences of contingency reserve shortfall falling to 58 periods in 2024. The increase in price was in line with a 2.27% higher contingency reserve requirement, as well as more expensive contingency reserve offers against a mild increase in the total contingency reserve offer quantity.

Between 2024 and 2025, despite a 1.77% rise in the contingency reserve requirement, the average contingency reserve price retreated by 40.85% to $11.65/MWh, the second lowest level since 2018. The significant decrease in price came on the back of a greater rate of expansion in the total contingency reserve offer quantity compared to the requirement, as well as the frequency of contingency reserve shortfall nearly halving to 30 periods in 2025.

[10, 11] As required in section A.2 of Appendix 5A of the Market Rules.

MARKET MONITORING
ANCILLARY SERVICE INDICES: RESERVE PRICES

CHART 26: RESERVE PAYMENT VS REQUIREMENT



Note: GST is not included in the calculation for reserve payment.

Chart 26 shows the total payment and requirement for primary and contingency reserves, classified as reserve payment and reserve requirement in the NEMS between 2021 and 2025.

The reserve requirement trended in the opposite direction of the reserve payment between 2021 and 2022. This was illustrated by a decrease in reserve requirement in contrast to an increase in reserve payment from 2021 to 2022. The reduction in the reserve requirement was mainly due to a downward revision of the Risk Adjustment Factor[12] for contingency reserve requirement from 1.5 to 1.0 since 8 July 2022. On the other hand, the reserve prices climbed amid higher price volatility and frequency of reserve shortfall.

From 2022 to 2024, the reserve payment moved in tandem with the reserve requirement from the preceding year. The effect of the downward revision of the Risk Adjustment Factor in July 2022 was first observable for an entire year in 2023. In 2023, the reserve payment fell for the first time since 2020, as a result of a shrinking reserve requirement alongside a decrease in reserve prices. Subsequently, 2024 was marked by an increase in reserve payment, driven by higher reserve requirement and reserve prices.

In 2025, as shown in Charts 24 and 25, both primary and contingency reserve prices declined from the previous year, with the contingency reserve price retreating by a larger extent. On the contrary, both primary and contingency reserve requirement expanded moderately, culminating in a 1.73% higher overall reserve requirement. The greater reduction in the reserve prices by magnitude weighed upon the reserve payment, pushing it down by 38.75% from 2024 to $46.74 million.

[12] For each reserve class, a Risk Adjustment Factor (RAF) is specified by the PSO and provided to EMC for use by its market clearing engine for determining reserve requirement in dispatch schedules.

MARKET MONITORING
ANCILLARY SERVICE INDICES: INTERRUPTIBLE LOAD

TABLE 11: IL ACTIVATIONS FOR CONTINGENCY RESERVE MARKET

Month	2024		2025	
	Instances of IL Activation	Number of Periods of IL Activation	Instances of IL Activation	Number of Periods of IL Activation
Jan	0	0	0	0
Feb	1	2	3	4
Mar	3	13	5	7
Apr	3	4	4	5
May	2	2	2	2
Jun	4	4	2	2
Jul	1	1	2	5
Aug	1	1	2	3
Sep	2	2	3	3
Oct	2	3	3	4
Nov	2	3	3	4
Dec	4	6	0	0
Sum	**25**	**41**	**29**	**39**

Table 11 compares the interruptible load (IL)[13] activations to provide contingency reserve between 2024 and 2025.

There was a slight increase in the instances of IL activations, from 25 activations in 2024 to 29 in 2025. This was in line with the higher forced outage occurrences from 2024 to 2025. The duration of the activations, which is measured by the number of trading periods of IL activations, decreased slightly from 41 periods in 2024 to 39 periods in 2025.

The duration of the IL activations in 2024 lasted for either one or two periods across each of the 25 instances, with the exception of 27 March 2024 and 2 December 2024, during which the IL activation lasted for ten and three periods respectively. Similarly in 2025, most of the IL activations lasted for either one or two periods across each of the 29 instances. The longest duration for an IL activation instance was on 31 July 2025 for four periods.

IL activations usually occur to make up for sudden tight supply in the system. For instance, on 31 July 2025, amidst higher outage level, one CCGT facility experienced a forced outage in Period 40. The demand in that period reached 7,712MW, higher than the average of that day at 7,062MW. IL was activated in the same period following the forced outage. The supply cushion tightened in subsequent periods, during which primary and contingency reserve shortfalls were incurred in Periods 42 and 43, and the power system was in a high-risk operating state and an emergency operating state in these two periods respectively. IL was restored in Period 44 and the power system returned to a normal operating state, as the tight supply cushion was alleviated by the demand falling by a greater extent than the supply.

[13] An IL provider offers its load or the load of its customers to be interrupted in exchange for reserve payments under the Interruptible Load scheme.

MARKET MONITORING
ANCILLARY SERVICE INDICES: REGULATION PRICES

CHART 27: REGULATION AVAILABILITY VS REGULATION PRICE

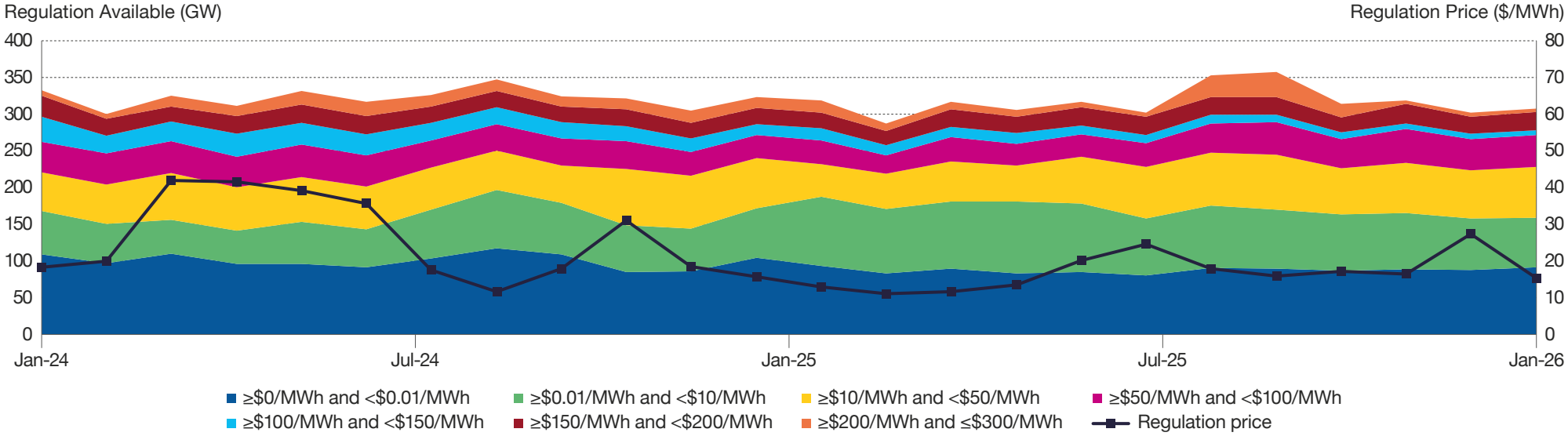


Chart 27 shows the monthly aggregated regulation quantity offered at various price ranges against the monthly regulation prices for the past two years.

Compared to 2024, where the regulation price averaged $25.72/MWh for the year and ranged between $11.65/MWh and $41.96/MWh on a monthly level, the regulation price in 2025 was 33.97% lower and less volatile, averaging $16.98/MWh for the year and ranging from $11.00/MWh to $27.31/MWh monthly.

This was consistent with a 4.62% lower average regulation requirement, a milder reduction of 1.66% in the aggregated regulation quantity offered, a greater proportion of offers in lower-priced tranches, as well as a decline in the frequency of regulation shortfall from 20 periods in 2024 to 14 periods in 2025. Notably, the proportion of offers experienced the largest increase in the "≥$0.01/MWh and <$10/MWh" tranche and the largest decline in the "≥$100/MWh and <$150/MWh" tranche in 2025, as compared to the preceding year.

Compared to the same month in 2024, the monthly average price marked the sharpest year-on-year rise in November 2025 to $27.31/MWh, which was also the peak monthly price of the year. November 2025 registered a 0.94% dip in the regulation offer quantity against a 4.62% drop in the requirement, as well as less expensive offers. However, there were three periods of regulation shortfall in the month compared to none in November 2024, thereby pushing the average price up from the previous year. The monthly average price fell by the greatest extent in April 2025 in the context of a smaller contraction in the regulation offer quantity compared to the requirement, as well as the offers becoming more concentrated in the "≥$0.01/MWh and <$10/MWh" tranche.

ECONOMETRIC MODEL AND OUTLIER PRICES

ECONOMETRIC MODEL AND OUTLIER PRICES

To identify and analyse outlier occurrences of the Uniform Singapore Energy Price (USEP), the Market Surveillance and Compliance Panel (MSCP) uses an econometric model[14] as a means of estimating the dependent variable USEP through the use of various independent variables, such as the energy supply cushion, supply by generation type, energy offers below $200 per megawatt hour (MWh), reserve cushion, and lagged fuel oil prices.

In 2023, the MSCP engaged the services of Assistant Professor Wang Wenjie from the Economics department of the School of Social Sciences at Nanyang Technological University (NTU), along with PhD candidate Li Wenze and Master's student Cai Jinbo. The NTU team sought to enhance the resilience of the econometric model and suggest pertinent variables and methodologies for pinpointing USEP outliers. The revised econometric model was approved by the MSCP and has been integrated into the MSCP Annual Report since 2023.

Table 12 shows the estimation results for the three most significant explanatory variables detected by the revised econometric model for January 2003 to December 2025.

A positive coefficient indicates a direct relationship between the explanatory variable and the USEP; when the variable increases, the USEP rises as well, and vice versa. A negative coefficient indicates an inverse relationship between the variable and the USEP; when the variable increases, the USEP is expected to fall instead, and vice versa.

Given that all variables are log-transformed, Table 12 provides the following observations for January 2003 to December 2025:

- a 1% increase in supply cushion lowers the USEP by 5.12%;
- a 1% increase in offers below $200/MWh lowers the USEP by 2.84%; and
- a 1% increase in lagged fuel oil price raises the USEP by 1.91%.

TABLE 12: ESTIMATION RESULTS

Variable	Coefficient
	Jan 2003 – Dec 2025
Constant	10.975
LOG (Supply Cushion)	-5.117
LOG (Offers Below $200/MWh)	-2.840
LOG (Lagged Fuel Oil Price)	1.913

TABLE 13: MODEL DIAGNOSTICS

Model Diagnostics	Jan 2003 – Dec 2025
R^2	0.892
Number of Observations	8,285

The level of statistical significance of the variables, measured as the P-value for the three variables stated in Table 12 is less than 0.01. This indicates that the three selected variables play a significant role in explaining variations in the USEP as the value represents a less than 1% chance of the variables not explaining the changes in the USEP from 2003 to 2025.

Table 13 shows the model diagnostics represented by R^2 for the period of January 2003 to December 2025.

The R^2 value measures the proportion of the variation in the dependent variable (USEP) explained by the independent variables (e.g., supply cushion, offers below $200/MWh and lagged fuel oil price).

The econometric model analysed 8,285 observations spanning January 2003 to December 2025, resulting in an R^2 value of 0.892. This signifies that 89.2% of the fluctuations in the USEP can be attributed to changes in the model's explanatory variables such as supply cushion, offers below $200/MWh, lagged fuel oil price, and others. The R^2 value slipped 0.001 from 2024, indicating a negligible change in the explanatory power of the model in 2025.

[14] Further details on the revised econometric model are available in Econometric Model Design, Approach and Methodology Report – A Review of the Current Methodology.

ECONOMETRIC MODEL AND OUTLIER PRICES

IDENTIFICATION OF OUTLIER PRICES

CHART 28: ACTUAL VS PREDICTED LOG USEP WITHIN THREE STANDARD DEVIATIONS

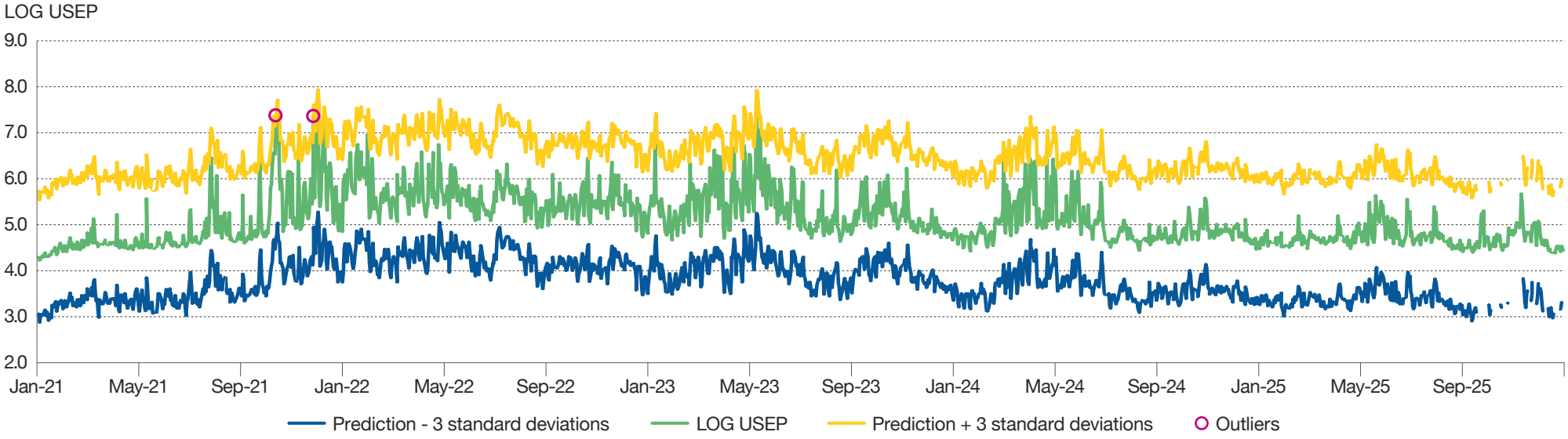


Chart 28 shows the actual daily average USEP, the upper and lower bands of the model's predicted daily average USEP, which are three standard deviations above and below the predicted USEP, and the outliers identified by the revised econometric model from January 2021 to December 2025, expressed on a logarithmic scale.

Identification of Outliers in 2021 – 2025

Using the same model as in 2023, for the period from 2021 to 2025, the outliers identified by the model were for 12 October 2021 and 26 November 2021, coinciding with the global energy crunch that began in late 2021. These outliers exceeded the upper bound of the predicted USEP by $91.59/MWh and $387.48/MWh respectively.

Following the integration of the Energy Storage Systems (ESS) facilities in the market to allow for both submission of positive (discharge) and negative (charge) offer quantities since September 2025, ESS facilities can be scheduled to either charge or discharge. As the model did not incorporate this effect as an explanatory variable, after the inclusion of market data from 2025, the impact of market conditions on the USEP for a certain number of days since September 2025 could not be explained by the model. Nevertheless, there was no outlier detected by the model for most of the time in 2025, which was underlined by the limited USEP volatility throughout the year due to market forces and various market stabilisation schemes in place.


INVESTIGATIONS

INVESTIGATIONS
SUMMARY OF INVESTIGATION ACTIVITIES

The Market Surveillance and Compliance Panel (MSCP) may initiate an investigation into any activity in the wholesale electricity market or into the conduct of a market participant, the Market Support Services Licensee, Energy Market Company (EMC) or the Power System Operator (PSO) that is brought to its attention by a referral or complaint from any source, or that the MSCP of its own volition determines as warranting an investigation.

Any investigation initiated by the MSCP is undertaken by the Market Assessment Unit at the direction of the MSCP, in accordance with the investigation process outlined in the Market Rules. The MSCP may refuse to commence or may terminate an investigation when it is of the view that a complaint, referral or investigation is frivolous, vexatious, immaterial or unjustifiable, not directly related to the operation of the wholesale electricity market, or within the jurisdiction of another party.

Table 14 reflects the position regarding investigation and enforcement activities from the start of the market on 1 January 2003 to 31 December 2025, with a column focusing on the period under review. To provide a comparison on the investigation and enforcement activities in 2025 against that in recent years, a column on the average number of investigation and enforcement activities conducted for the calendar years 2021 to 2024 is computed.

Determinations of breach made by the MSCP are published in accordance with the Market Rules.

TABLE 14: INVESTIGATION AND ENFORCEMENT STATISTICS

Rule Breaches	Calendar Year 2003–2025	Average (Calendar Year 2021–2024)	Calendar Year 2025
(A) Total number of offer and bid variations after gate closure received	**40,089**	**544**	**488**
Total number of cases closed	**39,982**	**528**	**499**
• cases in which the MSCP determined a breach	269	23	10
• cases in which the MSCP determined no breach	19,592	401	465
• cases in which the MSCP took no further action	20,121	103	24
(B) Origin of cases (excluding offer and bid variations after gate closure)	**223**	**5**	**1**
• self-reports	180	2	1
• referrals or complaints	36	3	0
• initiated by the MSCP	7	0	0
Total number of cases closed	**223**	**5**	**1**
• cases in which the MSCP determined a breach	149	3	1
• cases in which the MSCP determined no breach	14	0	0
• cases in which the MSCP took no further action	49	1	1
• cases in which the MSCP made a determination on an event of default	11	1	0
- suspension orders	6	1	0
- other orders	2	0	0
- termination orders	2	1	0
(C) Total number of MSCP hearings	**19**	**2**	**0**
• suspension hearings	10	1	0
• termination hearings	1	0	0
• investigation hearings	8	1	0
(D) Enforcement action			
• highest financial penalty imposed on a party in breach	$842,861	$750,000*	$9,400
• total financial penalties imposed on parties in breach	$2,631,261	$338,125	$19,400
(E) Costs			
• highest award of costs imposed on a party in breach	$43,750	$15,000*	$2,500
• total costs imposed on parties in breach	$448,625	$34,925	$17,900
Market Efficiency and Fairness			
Total number of cases	**8**	**0**	**0**
• referrals or complaints	3	0	0
• initiated by the MSCP	5	0	0
Total number of cases closed	**8**	**0**	**0**

* This figure refers to the highest financial penalty/ award of costs imposed on a party in breach between the calendar years 2021 and 2024.

INVESTIGATIONS
SUMMARY OF INVESTIGATION ACTIVITIES

Highlights of Enforcement Activities in 2025

- There were fewer number of offer variations after gate closure received in 2025, as compared to the average from 2021 to 2024. Specifically, there were 488 offer variations after gate closure submissions made this year, below the average of 544 submissions from 2021 to 2024. The specific number of offer variations after gate closure made from 2021 to 2025 is contained in Table 16.
- The MSCP reviewed 499 cases of offer variations after gate closure in 2025, lower than the average of 528 cases from 2021 to 2024.
- In 2025, the MSCP determined 34 cases of offer variations after gate closure to be in breach of the Market Rules. Of the 34 cases in breach, the MSCP took enforcement action on ten cases and no further action on 24 cases.
- The MSCP assessed 465 cases of offer variations after gate closure to be not in breach of the Market Rules in 2025.
- Additionally, the MSCP conducted one investigation in 2025 that was not related to offer variations after gate closure. The MSCP determined to take no further action in that matter.
- There were no events of default in 2025 and accordingly no suspension or termination hearings conducted by the MSCP. This was also the case for 2023 and 2024. While four default notices were issued in 2022, the MSCP did not have to make any determinations on them. In 2021, 19 notices of default were issued by EMC and the MSCP issued three suspension orders, one other order, and two termination orders.
- The MSCP issued seven rule breach determinations in 2025. The rule breach determinations were for the ten cases of offer variations after gate closure assessed to be a breach of the Market Rules.
- In 2025, a total of $19,400 in financial penalties was imposed across three rule breach determinations, with $9,400 being the highest financial penalty imposed on a party in breach. A non-compliance letter from the MSCP was issued for the remaining four rule breach determinations. From 2021 to 2025, the highest financial penalty imposed on a party in breach was in 2022 at $750,000 on YTL PowerSeraya regarding its breach for SER CCP2's failure to comply with the PSO's directions on 7 July 2022. The MSCP had in its determination considered the need to send a strong signal that compliance with the PSO's dispatch directions is vital in the national interest and the necessity for specific deterrence where an MP has been guilty of repeated breaches of the Market Rules.
- A total of $17,900 in investigation costs was imposed on the market participants in breach.

SECTIONS 50 & 51 OF THE ELECTRICITY ACT

SECTIONS 50 AND 51 OF THE ELECTRICITY ACT

Competition-Related Provisions in the Electricity Act

The Energy Market Authority (EMA) is responsible for enforcing the electricity sector-specific anti-competitive agreements and abuse of dominance provisions contained in sections 50 and 51 of the Electricity Act.

Section 50 of the Electricity Act prohibits agreements, decisions, or concerted practices by persons, which have as their object or effect the prevention, restriction, or distortion of competition in any wholesale electricity market or the retail electricity market in Singapore. The prohibition applies, in particular, to agreements, decisions, or concerted practices which:

- directly or indirectly fix purchase or selling prices or any other trading conditions of electricity in Singapore;
- limit or control generation of electricity, any wholesale electricity market, the retail electricity market, technical development or investment in the electricity industry in Singapore;
- share markets or sources of supply of electricity in Singapore;
- apply dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage;
- make the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts; or
- provide for the acquisition, directly or indirectly, of shares in or the assets of an electricity licensee.

Section 51 of the Electricity Act prohibits any conduct on the part of one or more persons, which amounts to the abuse of a dominant position in any wholesale electricity market or the retail electricity market in Singapore, if it may affect trade within Singapore.

Conduct constitutes an abuse if it consists of:

- directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions of electricity in Singapore;
- limiting generation of electricity, any wholesale electricity market, the retail electricity market or technical development in the electricity industry in Singapore to the prejudice of consumers;
- applying dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage; or
- making the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts.

Information Requirements to Assist the EMA

The Singapore Electricity Market Rules[15] (Market Rules) provide for the Market Assessment Unit (MAU), under the supervision and direction of the Market Surveillance and Compliance Panel (MSCP), to develop a set of information requirements to assist the EMA in fulfilling its obligations with respect to prohibiting anti-competitive agreements and abuse of a dominant position, under sections 50 and 51 of the Electricity Act.

The first set of information requirements was finalised in consultation with the EMA and published on 27 March 2003. As the market evolved, modifications to the information requirements were published on 18 August 2003, 28 January 2004, 3 April 2012, 22 August 2016 and 12 August 2020, with the latest modification made and published on 15 March 2023.

The MAU regularly provides data to the EMA according to the information requirements, as shown in the table below.

[15] Section 4.3.10 of Chapter 3 of the Market Rules.

SECTIONS 50 AND 51 OF THE ELECTRICITY ACT

TABLE 15: INFORMATION REQUIREMENTS TO ASSIST THE AUTHORITY TO FULFIL ITS OBLIGATIONS WITH RESPECT TO COMPETITION AND ABUSE OF A DOMINANT POSITION UNDER SECTIONS 50 AND 51 OF THE ELECTRICITY ACT

No.	Description	Frequency of Collection	Means of Provision to EMA
1	Maximum capacity for primary reserve, contingency reserve, regulation, generation and load curtailment of each registered facility	Once and upon change	Electronic mail from EMC to the EMA
2	Maximum combined generation capacity and reserve capacity of each registered facility	Once and upon change	Electronic mail from EMC to the EMA
3	Maximum ramp-up and/or ramp-down rate of each registered facility	Once and upon change	Electronic mail from EMC to the EMA
4	Offers and bids for energy, primary reserve, contingency reserve and regulation (prices and quantities) submitted by all market participants that are used in each dispatch run	Every two hours	Secure file transfer protocol (SFTP)* from EMC to the EMA
5	All offer and bid variations and revisions to standing offers and bids for energy, primary reserve, contingency reserve and regulation	Every two hours	SFTP from EMC to the EMA
6	Scheduled dispatch and load curtailment volumes by registered facility/market participants for all dispatch schedules, scenarios and re-runs	Every two hours	SFTP from EMC to the EMA
7	Half-hourly market energy price (MEP) at all market network nodes (MNN) for all dispatch schedules, scenarios and re-runs	Every two hours	SFTP from EMC to the EMA
8	Half-hourly prices and requirements for energy, primary reserve, contingency reserve, regulation and load curtailment for all dispatch schedules, scenarios and re-runs	Every two hours	SFTP from EMC to the EMA
9	Metered injection and withdrawal quantities by registered facility/market participants, date and period	Daily	SFTP from EMC to the EMA
10	Uplift charges by date and period	Daily	SFTP from EMC to the EMA
11	Advisory notices reported by time, day and type	Daily	SFTP from EMC to the EMA
12	Intertie quantities and prices by date and period	Daily	SFTP from EMC to the EMA
13	Vesting contract reference prices by market participants, date and period	Monthly	SFTP from EMC to the EMA

Note: SFTP is a direct link established between EMC and the EMA's databases to allow information to be transmitted directly from EMC to the EMA.

Reports to the EMA

The MAU and the MSCP did not identify any possible anti-competitive agreements or abuse of a dominant position while conducting its investigative and monitoring activities from January to December 2025.

The MAU/MSCP continues to work closely and proactively with the EMA to promote closer collaboration, enhance information sharing and streamline the market monitoring functions, with the aim of improving the effectiveness and efficiency of market surveillance and oversight functions within the National Electricity Market of Singapore.

ASSESSMENT OF THE WHOLESALE ELECTRICITY MARKET

ASSESSMENT OF THE WHOLESALE ELECTRICITY MARKET
STATE OF COMPETITION AND INDUSTRY AND MARKET EFFICIENCY

Under the Singapore Electricity Market Rules (Market Rules), the Market Surveillance and Compliance Panel (MSCP) is required to provide a general assessment of the state of competition and compliance within, and the efficiency of, the wholesale electricity market. The MSCP's assessment for 2025 is as follows:

Market Structure and Competition

Entry of New Market Participants
11 new market participants were registered in the National Electricity Market of Singapore (NEMS) in 2025:

Wholesale Market Traders:

- 11 February 2025: Seatrium ACE
- 22 April 2025: Sungreen Energy
- 15 July 2025: Blue Whale Energy
- 24 July 2025: Yang Solar
- 2 September 2025: Keppel EaaS
- 12 September 2025: 9 Solar Fintech
- 22 September 2025: Keppel DHCS
- 10 December 2025: SP Energy Services

Generation Licensees:

- 28 January 2025: Aster Chemicals and Energy
- 21 February 2025: Keppel Sakra Cogen

Retailer Electricity Licensee:

- 8 August 2025: MyElectricity

New Facilities in the Market
In 2025, 30 new facilities joined the market. Of the 30 facilities, 19 were Intermittent Generation Sources (IGS) belonging to 9 Solar Fintech, Crystal Clear Environmental, Keppel EaaS, MyElectricity, Sembcorp Solar Singapore, Singapore District Cooling, Sungreen Energy, Sunseap Leasing and Yang Solar. The total number of IGS facilities in the NEMS rose from 60 to 79 this year, with a corresponding rise in total registered generation capacity from 1,005.542 megawatts (MW) in 2024, to 1,136.038MW in 2025.

One 600MW Combined Cycle Gas Turbine (CCGT) facility from Keppel Sakra Cogen was registered in the market this year. Additionally, three Open Cycle Gas Turbine (OCGT) facilities registered in the NEMS in 2025. Meranti Power registered two OCGT units, each with a 341MW generation capacity, while PacificLight Power registered one 100MW OCGT unit.

Two Embedded Generation (EG) facilities from Linde Gas Singapore and the Public Utilities Board registered in the NEMS this year.

Four load facilities from Blue Whale Energy, Crystal Clear Environmental and Diamond Electric were registered in the NEMS in 2025. The addition of these four load facilities added a combined 42.8MW of load curtailment capacity and 6.0MW of contingency reserve capacity to the market.

One 9.6MW Energy Storage Systems (ESS) facility from Singapore District Cooling was registered in the market.

Additionally, there were three transfer facilities this year – two EG facilities were transferred from Shell Eastern Petroleum to Aster Chemicals and Energy, and one IGS facility was transferred from Sunseap Leasing to Sunseap Commercial Assets.

Revision of Facilities' Capacities in the Market
15 facilities revised their capacities in 2025 – two OCGT facilities, one CCGT facility, one EG facility, three IGS facilities, one ESS facility and seven load facilities.

Following the registration of the two OCGT facilities from Meranti Power, they lowered each of their generation capacities from 341.40MW to 341MW, while also providing additional capacity for reserve and regulation.

The CCGT facility from Keppel Merlimau Cogen revised its generation capacity from 410MW to 420MW (as well as a revision from 49.76MW to 52.64MW for primary reserve, and from 144.01MW to 157.96MW for contingency reserve). One EG facility from ExxonMobil Asia Pacific raised its maximum generation capacity from 110MW to 116MW.

The revision of the IGS facilities was for an increment in maximum generation capacity, from 0.27MW to 4.196MW, 22.20MW to 34MW, and 2.12MW to 4.67MW, respectively.

The ESS facility from Singapore District Cooling recorded a revision in its maximum generation capacity from 4.90MW to 2.40MW.[16]

Seven load facilities from Blue Whale Energy, Crystal Clear Environmental, Diamond Electric and Singapore District Cooling registered changes in both maximum load curtailment and maximum contingency reserve capacities. The changes collectively brought about a 20.70MW increment in maximum load curtailment and a 5.20MW increment in maximum contingency reserve.

[16] The capacity of the ESS facility was previously modelled in the market clearing engine to be 4.9MW while its actual generation capacity is 2.4MW. Following the integration of the ESS facilities in the market to allow for both submission of positive (discharge) and negative (charge) offer quantities, the maximum generation capacity of the ESS facility has now been revised to its actual generation capacity of 2.4MW.

ASSESSMENT OF THE WHOLESALE ELECTRICITY MARKET
STATE OF COMPETITION AND INDUSTRY AND MARKET EFFICIENCY

Withdrawal of Market Participants and De-registration of Facilities in the Market
The registration of Shell Singapore in the NEMS expired on 15 April 2025. The two facilities from Shell Singapore were transferred to Aster Chemicals and Energy.

Apart from the two facilities from Shell Singapore which were transferred to Aster Chemicals and Energy, three facilities were de-registered from the NEMS, namely:

- one load facility from Diamond Electric providing 2.0MW of contingency reserve;
- one load facility from Diamond Electric providing 4.0MMW of load curtailment capacity and 2.7MW of contingency reserve; and
- one 2.2MW ESS facility from PSA Corporation.

Market Price Behaviour

Lower Electricity Prices in 2025 as Supply Cushion Strengthened
The Uniform Singapore Energy Price (USEP) continued to decline in 2025. The USEP decreased 28.56% to an annual average of $116.57/MWh in 2025, from $163.18/MWh in 2024, while the Wholesale Electricity Price (WEP) dropped 27.80% to an annual average of $117.78/MWh in 2025, from $163.12/MWh in 2024.

The dip in the electricity market price was aligned with the stronger supply cushion. While annual average demand rose 0.97% to 6,549MW, the 5.77% expansion in the annual average supply from 7,427MW to 7,855MW outpaced the demand growth, thereby strengthening the supply cushion by 3.90 percentage points to 16.64%. This resulted in a drop in both the USEP and WEP from their respective levels in 2024.

Industry and Market Efficiency of the Electricity Markets

Market Concentration
Market concentration measures the intensity of competition in the market by looking at the level of market share between market players. The less concentrated a market is, the more competitive it is.

The market share based on maximum generation capacity for the top three market players decreased to 49.28% in 2025, from 55.00% in the previous year, despite the composition of the top three market players remaining the same. The dilution of the market concentration level could be attributed to the registration of generation facilities belonging to new market participants (i.e. G12 and G13) joining the market.

In terms of metered energy quantity, the market share held by the three largest players in the NEMS continued to drop 0.34 percentage point to 50.78% in 2025. The composition of the top three market players in 2025 changed slightly from 2024, as G6 overtook G2 to be the third largest player in terms of metered energy quantity. Consistent with the movements in the market share based on maximum generation capacity, there was a notable increase in the electricity generation from the OCGT facilities belonging to G12 as it added a new representation of 0.56% to the market based on metered energy quantity.

Productive Efficiency
Productive efficiency in the NEMS continues to be high.

In 2025, CCGT units, the most efficient generation technology, continued to dominate the market both in terms of metered energy quantity and maximum generation capacity, despite a drop in market share from the previous year.

In terms of metered energy quantity, the market share of CCGT units stood at 96.99%, a 1.11 percentage points drop from 98.10% in 2024. The market share of CCGT units based on maximum generation capacity also decreased 6.45 percentage points from 90.74% in 2024 to 84.29% this year.

The drop in the market share of CCGT units was largely picked up by OCGT units and Electricity Imports (Import) units. The market share of OCGT units and Import units based on maximum generation capacity increased 6.18 and 1.52 percentage points respectively. This was consistent with a rise in the market share based on metered energy quantity of OCGT units and Import units by 0.56 and 0.47 percentage point respectively.

Pricing Efficiency
Prices in the NEMS reflected the demand and supply conditions in the market.

Specifically, the 5.77% increase in annual average supply outpaced the 0.97% expansion in annual average demand, resulting in a stronger supply cushion which strengthened 3.90 percentage points to 16.64%.

In 2025, 40.18% of the periodic supply cushion fell below the 15% level, compared to 68.90% in 2024. Conversely, this implied an increase in the proportion of periods with the periodic supply cushion greater than or equal to 15% from 31.10% in 2024 to 59.82% in 2025. As a result, electricity prices dropped in 2025, with USEP and WEP falling to annual averages of $116.57/MWh and $117.78/MWh respectively.

ASSESSMENT OF THE WHOLESALE ELECTRICITY MARKET
STATE OF COMPETITION AND INDUSTRY AND MARKET EFFICIENCY

Actual or Potential Design or Other Flaws and Inefficiencies in the Market Rules and Overall Structure of the Wholesale Electricity Markets Identified by the MSCP

Issues Submitted to the Rules Change Panel
Arising from the MSCP's monitoring and investigation work, the MSCP/MAU has been engaging the Rules Change Panel (RCP) on a rule change proposal to review gate closure exemptions for offer variations made after gate closure to reflect forced outages caused by human intervention.

The MSCP continues its efforts in assessing whether there are actual or potential design or other flaws and inefficiencies in the Market Rules and overall structure of the wholesale electricity market and to recommend actions to the RCP to mitigate such efficiencies

Looking Ahead

EMA to Complete Power Market Review by 2026[17]
Following the 2016 vesting contract regime, the EMA implemented a capacity market share cap of 25% for any generation licensee to prevent market concentration in the Singapore Wholesale Electricity Market (SWEM). In 2023, the EMA introduced the Temporary Price Cap, a regulatory guardrail (to mitigate extreme price volatility in the SWEM), in addition to other guardrails, such as the centralised process (to ensure sufficient generation capacity) and the establishment of the Gasco (as part of the centralised gas procurement process). The market is also undergoing significant changes with more new gas-fired power plants coming online over the next few years, increases in domestic solar capacity and the entry of large-scale low-carbon electricity imports.

In light of these market guardrails and structural shifts in the electricity markets, the EMA is reviewing how market power should be managed going forward. The review is expected to be completed in 2026. Pending the completion of the review, the EMA may permit mergers and acquisitions where the combined entity exceeds the 25% market share cap, provided binding commitments are made to ensure the protection of consumers.

Proposed EMA Data Code of Practice[18]
As a first step towards enhancing data sharing across the energy industry, the EMA proposes to enact the Data Code that aims to establish a comprehensive framework encompassing provisions, standards, and guidance for market licensees engaged in data exchange activities. The proposed Data Code will be implemented in phases.

Phase 1 of the Data Code focuses on licensees' management of the data and sets out the technical, procedural, and confidentiality requirements that licensees must observe when receiving and handling the EMA's data. Future phases of the Data Code will include and incorporate data best practices for the industry.

The Data Code applies to all licensees that hold licences granted by the EMA under the Electricity Act, Gas Act, and the District Cooling Act.

Singapore's Demand-Side Flexibility Roadmap[19]
The EMA launched the demand-side flexibility roadmap and outlined new initiatives for demand side resources to support the needs of Singapore's power system. Demand flexibility describes the ability of electricity users to adjust their electricity use in response to the needs of the power system, helping to balance electricity supply and demand.

The implementation strategies from the EMA include:

- To provide participants with greater certainty over their obligations during such contingency events, the EMA plans to reduce each interruptible load activation period to 30 minutes.
- The EMA will be publishing a Request for Information to explore the feasibility and design of a programme that can incentivise distributed energy resources, such as battery energy storage systems, and loads that are highly available to support system reliability on a near-continuous basis.
- A regulatory sandbox will be established to pilot and test innovative solutions, including the participation of electric vehicles charging stations in the demand response programme.

[17] EMA's Review of Sembcorp's Proposed Acquisition of Senoko | EMA
[18] Proposed Data Code of Practice | EMA
[19] New Initiatives to Bolster Power Grid's Reliability through Flexible Electricity Demand | EMA

ASSESSMENT OF THE WHOLESALE ELECTRICITY MARKET

STATE OF COMPLIANCE WITHIN THE WHOLESALE ELECTRICITY MARKET

Ensuring compliance is important in the operation of a competitive and reliable electricity market. Market participants that breach the rules may be subject to sanctions if the MSCP considers it appropriate.

The assessment of the state of compliance within the wholesale electricity market is set out below.

Offer and Bid Variations After Gate Closure

Currently, the Singapore wholesale electricity market has a gate closure period of 65 minutes. Any offer and bid variation that is submitted within 65 minutes of the beginning of a dispatch period will be reported by EMC to the MSCP for investigation.

However, not all offer and bid variations after gate closure are prohibited under the Market Rules. Specified circumstances are provided for in the Market Rules as exceptions that allow offer and bid variations to be submitted after gate closure.

Table 16 compares the number of offer and bid variations after gate closure submitted by market participants in 2025 with those of previous years.

TABLE 16: OFFER AND BID VARIATIONS MADE AFTER GATE CLOSURE

Year	Number of Offer and Bid Variations Made After Gate Closure	YOY Change (%)
2021	799	161.11
2022	559	-30.04
2023	414	-25.94
2024	405	-2.17
2025	488	20.49

The number of offer and bid variations after gate closure in 2025 reversed its downward trend since 2021. This year, the number of offer and bid variations rose 20.49% from 2024 to 488 cases.

The significant number of offer and bid variations after gate closure cases in 2021 was observed in the later months of the year, and coincided with occurrences of unplanned piped natural gas curtailment (the shortage of gas requires generation companies to conduct a fuel changeover from gas to diesel oil) and a volatile electricity spot price situation. Following the introduction of the EMA's measures to stabilise the power system and market under the Directed Supply Scheme (DSS), this statistic dropped from 799 cases in 2021 to 405 cases in 2024. The drop in the number of cases coincided with fewer EMA/Power System Operator (PSO) directions issued under the DSS and the Standby Capacity Scheme (SCS) in 2024. Given that these were directed by the EMA and the PSO under the SCS and DSS schemes respectively, they were deemed by the EMA to be treated as non-breaches of the Market Rules.

Compared to 2024, the number of offer and bid variations after gate closure rose by 20.49%, consistent with the number of forced outage occurrences rising from 78 to 83 in 2025.

Must-Schedule Requirement for Electricity Imports

One of the obligations of Import facilities is to ensure that its energy schedule for every hour is no less than the minimum scheduled quantity set by the EMA, save for prescribed circumstances, namely whether the import registered facility or any part of the interties is on outage and if it had been ordered, directed or instructed by the PSO to be scheduled at a different level. Any breach of the foregoing requirement will be reported to the MSCP for investigation.

The MSCP did not receive any reports of breaches of this requirement in 2025.

Automatic Financial Penalty Scheme

The Automatic Financial Penalty Scheme (AFPS) for generation registered facilities that deviate from their dispatch schedule came into effect on 17 November 2015. The AFPS was subsequently extended to include all load registered facilities (LRFs) when the Demand Response (DR) programme was introduced on 28 April 2016.

In 2025, 12 generation companies were issued automatic financial penalties amounting to a total sum of $430,863.57. The market also saw total penalties of $1,271,750.43 imposed on five DR and Interruptible Load (IL) providers under the AFPS, where a total sum of $1,245,967.60 was eligible to be refunded to the participating LRFs providing DR under the post-Demand Side Management (DSM) regulatory sandbox.

In 2025, 301 periods were penalised under the AFPS, compared to 139 periods in the previous year. There was a corresponding 128.80% increase in the amount of financial penalties imposed under the AFPS to $1,702,614.00 in 2025, from $744,163.95 in 2024.

TABLE 17: FINANCIAL PENALTIES IMPOSED UNDER THE AFPS ($)

Year	Amount of Financial Penalties Imposed Under the AFPS
2015 (from 17 Nov)	82,262.00
2016	544,846.25
2017	530,283.45
2018	401,146.29
2019	338,636.02
2020	288,401.00
2021	558,186.77
2022	1,028,132.45
2023	1,146,444.37
2024	744,163.95
2025	1,702,614.00

Demand Response Programme: Post-Demand Side Management Regulatory Sandbox

The DR programme was introduced in the NEMS in 2016 to allow consumers to voluntarily reduce their electricity usage when wholesale electricity prices are high, in exchange for a share of the savings from the reduction in wholesale electricity prices. Under the DR programme, LRFs that are scheduled for energy curtailment have to reduce their consumption accordingly. On the other hand, LRFs that are not scheduled for energy curtailment are required to continue their operations to consume at their planned non-curtailed level.

The EMA launched a two-year DSM regulatory sandbox from 1 January 2023 to 31 December 2024. The aim was to enhance the DR and IL programmes in the Singapore Wholesale Electricity Market to incentivise companies to optimise their energy usage by reducing their electricity consumption in the context of high prices or tight supply.

Specific to the DR programme, a relaxed penalty regime and lower compliance threshold was introduced:

- The threshold for non-compliance with the dispatch schedule, under both instances for energy curtailment and energy consumption, was lowered from 95% to 80%.
- The penalty amount for non-compliance with the dispatch schedule was lowered.
- No penalties were imposed for the first two instances of non-compliance. Upon the fifth instance of non-compliance, the DR facility is administratively suspended from the DSM regulatory sandbox.

From 1 January 2025, the EMA determined that the DSM regulatory sandbox will continue with some modifications to the DSM regulatory sandbox until EMC is ready to roll out the system changes required for permanent modifications to the DR programme. The features of the

DR programme under the post-DSM regulatory sandbox are set out below:

- Maintain the threshold for non-compliance with the dispatch schedule, under both instances for energy curtailment and energy consumption, at 80%.
- Maintain the lowered penalty amount for non-compliance with the dispatch schedule and revise the penalty formula to accommodate TPC activations.
- Refine the penalty regime for the first two instances of non-compliance.

Prior to the roll-out of the system changes required for permanent modifications to the DR programme, all LRFs continue to be subject to the 95% compliance threshold and penalty amounts via the AFPS. If the participant assesses that it should not have been penalised or that the penalty amount should have been lower under the post-DSM regulatory sandbox, it can submit a request to EMC to initiate a penalty refund.

As part of its monitoring of the post-DSM regulatory sandbox, the MAU provides a report of the DR monitoring to the EMA. Every month, a report on the details of the number of periods of non-compliance and penalty imposed under the original DR programme, and the number of periods of non-compliance under the post-DSM regulatory sandbox programme, including the expected refund amounts due to concession or lower penalty threshold, was provided to the EMA. The said report also contained an overview of the remaining concessions that each LRF has, as well as information on the concessions that had been utilised by the LRF.

The EMA also determined to discontinue the measures that were implemented under the IL regulatory sandbox on 31 December 2024. The original IL framework came into effect on 1 January 2025.

MSCP Determinations Issued

For the period 1 January to 31 December 2025, the MSCP issued seven determinations regarding rule breaches. The MSCP did not issue any determinations regarding the appeal for refund of financial penalty under the AFPS.

Failure to Comply with Gate Closure Rules
All seven MSCP rule breach determinations issued in 2025 were in relation to the failure to comply with gate closure rules. Six market participants were penalised in relation to ten offer variations after gate closure events:

- Keppel Seghers Tuas Waste-to-Energy Plant's offer variations after gate closure on 27 October 2024;
- ExxonMobil Asia Pacific's offer variations after gate closure on 13 December 2024;
- ExxonMobil Asia Pacific's offer variations after gate closure and failure to submit offer variations to reflect generating capability on 27 January 2025;
- TP Utilities' offer variations after gate closure on 17 February 2025;
- Tuas Power Generation's offer variations after gate closure on 21 April 2025;
- Aster Chemicals and Energy's offer variations after gate closure on 4 May 2025; and
- PacificLight Power's offer variations after gate closure on 31 July 2025.

MSCP's Role to Safeguard the Financial Integrity of the Wholesale Electricity Market

The MSCP receives information from EMC when a notice of default[20] is issued. Such a notice is issued by EMC to a defaulting market participant in accordance with section 7.3.3 of Chapter 3 of the Market Rules and provides detailed information to the MSCP on the alleged event of default.

Under the circumstances when a default notice has been issued[21], the MAU and the MSCP remain vigilant for further information and confirmation by EMC about the default event's remedy. If a default is not remedied, EMC takes the steps required by the Market Rules, which include issuing a request to the MSCP for a suspension hearing.

Subsequently, the MAU works closely with EMC to make sure that all relevant information about the defaulting market participant's financial situation is provided in order to prepare the facts that will form the basis for the MSCP's decision, along with the evidence presented to the panel on the day of the hearing. All decisions and orders issued by the MSCP after a suspension hearing are made in accordance with the Market Rules, to minimise the market's financial risk exposure and ultimately to safeguard the financial integrity of the NEMS.

In 2025, like in 2024, there were no default notices issued by EMC. The MSCP and the MAU continue to be vigilant and committed in their monitoring and actions in accordance with the Market Rules in order to safeguard the financial integrity of the wholesale electricity market.

[20] A default notice is a notice issued by EMC to a market participant pursuant to section 9.2.1.1 of Chapter 2 or section 7.3.3.1 of Chapter 3 of the Market Rules, and has, where applicable, the extended meaning ascribed thereto in section 9.1.5 of Chapter 2 of the Market Rules.
[21] Circumstances when an event of default is declared are specified in section 7.3.1 of Chapter 3 of the Market Rules.


CONCLUSION

CONCLUSION

The Market Surveillance and Compliance Panel (MSCP) is fairly satisfied with the state of compliance in the National Electricity Market of Singapore (NEMS) in 2025.

The MSCP issued seven rule breach determinations in 2025, the same number as the previous year. All seven determinations were in relation to offer variations after gate closure, compared to six such determinations made in 2024. This was consistent with the increase in the number of cases related to offer variations submitted after gate closure from 405 in 2024 to 488 this year.

Wholesale electricity prices fell to one of the lowest levels of the past five years, dipping a further 27.80% from the 2024 average of $163.12 per megawatt hour (MWh) to $117.78/MWh this year. This trend is not only consistent with this year's decline in fuel oil prices, but also reflected the fundamental shifts in NEMS demand and supply in 2025. Supply this year climbed to its strongest level since 2022 to an annual average of 7,855MW. Additionally, while only registering a modest 0.97% increase from the previous year, electricity demand has set a new record high of 6,549MW.

With regards to market concentration, the identities of the three largest generation companies changed slightly. There was a marginal dip in the combined market share by metered energy quantity of the three largest companies in 2025, signalling an improvement in market competitiveness. This was observed in the context of a moderately concentrated market.

In 2025, 11 new market participants joined the NEMS, of which eight are Wholesale Market Traders, two are Generation Licensees, and one is a Retail Electricity Licensee. Additionally, 30 new facilities registered in the market in 2025. This significantly boosted the generation capacity in the NEMS, most notably with the addition of three Open Cycle Gas Turbine units totalling 782MW and a 600MW Combined Cycle Gas Turbine facility. Intermittent Generation Sources (IGS) facilities accounted for 19 of the 30 new units, increasing the total generation capacity of IGS by 130.50MW from the previous year to 1,136.04MW. Additionally, four new load facilities collectively added 42.80MW load curtailment capacity and 6.0MW contingency reserve capacity to the market. One market participant withdrew its participation in the NEMS in 2025, while several facilities were de-registered from the market or transferred to other market participants. As at the end of 2025, the total maximum generation capacity registered in the NEMS amounted to 13,883.04MW, while maximum load curtailment capacity increased to 167.30MW.

As part of its monitoring work, the MSCP released quarterly reports describing its day-to-day monitoring, cataloguing and evaluation activities and analyses of current market conditions and their impact on wholesale electricity prices. The MSCP also published its determinations issued in cases of non-compliance, in order to promote transparency and accountability and to provide confidence to market participants regarding enforcement of relevant rules and regulations. During the year, the MAU provided inputs for the concept paper on Gate Closure Exemptions for the Cancellation or Delaying of, and Bringing Forward, of Synchronisation.

The MSCP remains highly satisfied with the knowledge and technical expertise of the Market Assessment Unit in undertaking monitoring and surveillance activities, the investigation of alleged breaches of the Market Rules, and the advisory functions to the MSCP on enforcement actions to be taken against market participants.

Professor Walter Woon
Chairman
Market Surveillance and Compliance Panel


USER GUIDE

USER GUIDE

Data

- Due to rounding, numbers presented throughout this report may not add up precisely to the totals indicated, and percentages may not precisely reflect the absolute figures for the same reason.
- All real-time and forecast prices and settlement data are provided by Energy Market Company.
- Annual Vesting Prices are provided by SP Services as the Market Support Services Licensee on the Open Electricity Market website every quarter, based on a list of long-run marginal cost parameters of a combined cycle gas turbine (CCGT) unit from the Energy Market Authority, including capital cost, non-fuel operating cost, carbon price and fuel oil price.
- Data for forecast demand and outages is compiled from reports prepared by the Power System Operator (PSO), including advisory notices.
- Throughout this report, demand figures are based on the forecast demand supplied by the PSO, except where metered energy quantities are indicated.
- Metered energy quantities are supplied by SP Services. All metered data used in this report is final data, derived after any settlement re-runs.
- CCGT units refer to all generating units clustered under the CCGT/cogen/trigen umbrella.

Supply Indices

- Capacity ratio indicates the utilisation of a generation facility as a ratio of its scheduled output of energy, reserves and regulation to its maximum generation capacity.
- Supply cushion is the ratio between (a) the difference between supply[22] and demand and (b) supply. Supply cushion measures supply adequacy, the level of capacity which was offered but not scheduled and could be called up if necessary. The supply is the sum of offers submitted by generation companies. Demand refers to the forecast demand used by the PSO to determine the real-time dispatch schedule.
- The maximum generation capacity for each generation company is the maximum generation capacity in the standing capability data.
- Under the Singapore Electricity Market Rules (Market Rules) and the System Operation Manual (SOM), outages of generation registered facilities are defined as follows:

  a) planned outage is defined in the SOM to "include both the Annual Outage plan for overhaul, retrofitting or inspection and the Short-term Outage Plan for urgent repair or maintenance"; and

  b) forced outage is defined in the Market Rules as "an unanticipated intentional or automatic removal from service of equipment or the temporary de-rating of, restriction of use, or reduction in performance of equipment".

There may be slight differences in the outage and supply related figures in the Market Surveillance and Compliance Panel Annual Report and the National Electricity Market of Singapore (NEMS) Market Report due to differing methodologies. Energy Storage Systems (ESS) figures used in this report will be based on actual capacity instead of modelled capacity, used in the NEMS Market Report.

Periods

Each day is divided into 48 half-hour periods. Period 1 is from 0000 to 0029 and Period 48 is from 2330 to 2359.

Names of Business Entities

The MSCP Annual Report refers to business entities by their commonly used names instead of the full names registered with the Accounting and Corporate Regulatory Authority. Specifically, information related to company ownership is not reflected, e.g., exempt private company, private/public company limited by shares, public company limited by guarantee, etc.

[22] Following the integration of the ESS facilities in the market to allow for both submission of positive (discharge) and negative (charge) offer quantities, ESS facilities can be scheduled to either charge or discharge. Due to this bi-directional characteristic, the definition of total supply in the NEMS has been revised to exclude ESS supply.

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This publication is meant only for general information and nothing in it should be construed as advice. Whilst the Market Surveillance and Compliance Panel (MSCP) has taken reasonable care in the preparation of this publication, the MSCP does not warrant its suitability for any purpose. You should always consult your professional advisors before relying on this publication to make any decision.

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