



Building Smart and Resilient Infrastructure

CEM is committed to ensuring the safe and stable operation of the power system.

In response to various risk scenarios, it has formulated corresponding power supply assurance and emergency arrangements, continuously strengthening power grid facilities, backup capacity, and technological investment to enhance the reliability and resilience of the power supply system.

9.1 Power Supply System

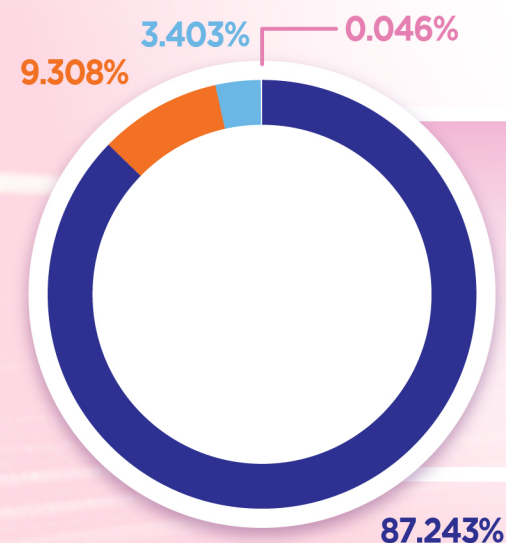
CEM's local power generation system is centred on the Coloane Power Station, which mainly comprises Coloane Power Station A and Coloane Power Station B. While ensuring a safe and stable electricity supply, the Company continuously optimises its fuel mix and generation unit operating strategies, prioritising the utilisation of high-efficiency generating facilities.

In 2025, supported by a stable supply of natural gas and the efficient operation of gas-fired units, the CC1 combined cycle gas turbine at Coloane Power Station B continued to serve as the core generation facility. Annual electricity generation reached 550.8 GWh, accounting for 94.5% of total generation, representing an increase of 13.6% compared with the previous year. The low-speed diesel generators at Coloane Power Station A were mainly maintained in standby mode and were only briefly activated under special circumstances such as typhoons. Annual generation amounted to 32.1 GWh, accounting for 5.5% of total generation, representing a 38.6% decrease year-on-year. Total electricity generation for the year reached 582.9 GWh.

In terms of fuel consumption, natural gas consumption at Coloane Power Station B reached 140,240,562 cubic metres, representing a 7.9% increase compared with the previous year. Meanwhile, heavy fuel oil consumption by the low-speed diesel units at Coloane Power Station A amounted to 6,301 tonnes, representing a 37.8% decrease year-on-year. To ensure stable electricity production, CEM maintains close cooperation with natural gas suppliers to ensure a stable fuel supply.

While developing local generation capacity, CEM has also been progressively introducing renewable energy elements and promoting the application of photovoltaic generation. For example, solar PV systems have been installed at substation facilities to supplement part of the electricity demand of such facilities and support the diversification of the energy mix.

To maintain system reliability and efficiency, CEM has completed all scheduled maintenance work for 2025 as planned, including the overhaul of gas turbines, their combustion chambers and reduction gears; the restoration of waste heat boiler efficiency; the extension of circuit breaker service life; and the assessment of transformer condition. CEM also regularly reviews the overall grid development plan and the allocation of power resources to ensure that current and projected power supply capacity over the coming years will be sufficient to meet Macao's electricity demand.



Energy Source Mix

- Imported from China Southern Power Grid
- Generated by CEM
- Purchased from Macao Refuse Incineration Plant
- Photovoltaic Generation

9.2 Transmission and Distribution Network

As the distribution network operator, CEM is fully responsible for the construction, upgrading and operation and maintenance of the distribution network, covering the optimisation and reinforcement of high-, medium- and low-voltage power networks. In accordance with the overall grid development plan, the Company continues to enhance the structure of the distribution network to ensure that electricity is transmitted safely and reliably to end users.

In 2025, CEM invested MOP 586 million in transmission and distribution infrastructure to further enhance grid capacity and reliability.

Key Transmission and Distribution Developments in 2025

Tai On Substation (New Urban Zone A)

The 110kV and 11kV network has been commissioned to support power supply for public housing, government facilities and the Light Rapid Transit (LRT) 22kV dedicated network. High-voltage cable installation was completed and commissioned in October.

Barra Substation Construction

The external wall works have been completed, and the main electrical equipment is now being installed on site; this will supply power to the transport hub, the flood control pumping station and the commercial facilities.

Lisboa Substation Upgrade

Launch of the project to upgrade the 66kV system to 110kV; upon completion, it will increase capacity and enhance network stability.

Critical Equipment Replacement

Replacement of the 66/11kV transformer at St Paul's Substation; completion of the replacement of eight 66kV cable joints.

Medium-Voltage Network Optimisation

Replacement of 135 medium-voltage cables (4.9%), inspection of 109 cables, and replacement of 45 transformers and 28 ring main units.

Capacity Expansion

To support new residential and mixed-use developments, the total number of transformers increased by 3.3%.

Electricity generated and purchased by CEM is delivered to all users across Macao through a well-established and sophisticated power grid system. Electricity is first transmitted through the high-voltage transmission network, including 220kV, 110kV and 66kV high-voltage cables, enabling stable long-distance power transmission. It is then distributed through 22kV and 11 kV medium-voltage networks, before finally being delivered safely and reliably to commercial, industrial and residential customers through the low-voltage distribution system over shorter distances.

The Macau power grid is primarily constructed using underground cables, significantly enhancing supply reliability and resilience while reducing the impact of weather conditions on electrical infrastructure. This approach also improves the urban landscape and public safety. Through a multi-tier voltage design and comprehensive network planning, CEM ensures that electricity transmission remains efficient, stable and resilient.

Civil Work Objects	2023	2024	2025
High-Voltage Cables (km)			
Total length of 220kV cables	123	123	123
Total length of 110kV cables	366	375	382
Total length of 66kV cables	585	585	585
Total length of high-voltage cables	1,074	1,083	1,090
Medium-Voltage Cables (km)			
Total length of medium-voltage cable	2,691	2,809	2,868
Low-Voltage Cables (km)			
Underground low-voltage cable length	954	985	1,010
Overhead low-voltage cable length	73	72	73
Total length of low-voltage cables	1,027	1,057	1,083
Public Lighting			
Underground public lighting cable length (km)	601	636	657
Overhead public lighting cable length (km)	62	61	62
Total length of public lighting cable (km)	663	698	719
Number of public lighting columns	12,010	12,957	13,573
Number of wall-mounted public lights	4,561	4,541	4,582

9.3 Smart Grid and Digitalisation

CEM continues to regard innovation as a core driving force and actively promotes research and innovation initiatives. During the year, CEM expanded the application of big data and artificial intelligence technologies to enhance operational efficiency and service quality, laying a solid foundation for the Company's digital transformation.

9.3.1 Smart Grid

CEM continues to advance smart grid development with the aim of enhancing operational control and professional management of protection relay systems. To strengthen dispatch and control capabilities for protection relay equipment and grid fault information, CEM has deployed a Protection Relay Information Management System, significantly enhancing operational safety across the power grid.

During the year, CEM continued to carry out the "Study on the Development Roadmap for Macao's Power Grid in the Context of Carbon Neutrality", focusing on analysing CEM's business drivers and long-term vision, and thoroughly examining the key upgrade requirements for the power grid in the context of decarbonisation, digitalisation and smart transformation. The project utilised internationally recognised assessment standards to objectively evaluate the current maturity of the smart grid and identify key areas for enhancement, thereby charting a strategic roadmap for the future development of CEM's smart grid.

To further enhance power grid operational efficiency, CEM optimised and upgraded its dispatch automation system during the year, while developing an outage management system and a protection information management system, and launching pilot projects for low-voltage distribution network automation. As another key advancement, we have launched the Industrial Control Situation Awareness System project and are actively exploring potential applications of artificial intelligence technology in dispatch operations.

Building on the above research, CEM further formulated the Smart Grid Medium-Term Development Plan (2026-2028), providing a systematic roadmap for the digitalisation and intelligent development of the power grid. The plan focuses on key areas including upgrades to grid communication infrastructure, optimisation of grid control and operations, application of customer-side technologies, support for electric mobility, and integration of distributed energy resources. It aims to progressively enhance the grid's data perception capabilities, operational coordination, and overall system resilience. Through the orderly implementation of these initiatives, CEM will continue to strengthen the intelligent foundation of the power grid, supporting the integration of distributed energy, the electrification of transport, and the development of smart cities, while enhancing the safety, reliability and long-term sustainability of the power system.

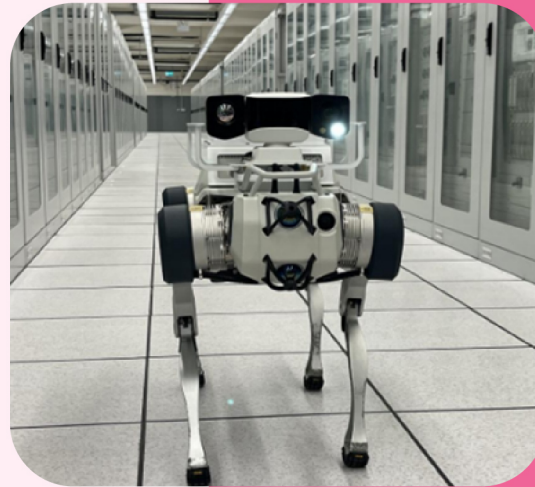
9.3.2 Adoption of BIM to Enhance Operation and Maintenance Efficiency

In 2025, CEM actively introduced Building Information Modelling (BIM) technology and applied it to remote command and collaboration scenarios, significantly enhancing the level of refinement and visualisation in substation equipment management and operation and maintenance (O&M). When abnormalities occur in substation equipment, digital simulation models developed through BIM technology enable three-dimensional visualisation of building structures and electrical equipment. This supports remote technical personnel in accurately identifying faulty equipment and providing real-time assistance to on-site teams, thereby effectively reducing maintenance and repair time. Through the application of BIM technology, CEM has further improved the efficiency of substation O&M and its capability to respond to faults, laying a solid foundation for stable grid operation and the advancement of smart grid development.

9.3.3 Robotic Dog Intelligent Inspection System

In 2025, CEM introduced a smart substation inspection system, replacing traditional manual inspections with an integrated solution comprising robotic dog inspections, a monitoring platform and a power supply system, enabling remote intelligent inspection and centralised monitoring. As a key component of this smart inspection approach, the robotic inspection dog is equipped with infrared thermal imaging, partial discharge sensors and high-definition cameras, allowing it to accurately detect equipment abnormalities and issue real-time alerts through the system.

The smart inspection system operates continuously on a 24/7 basis and is capable of completing comprehensive substation inspections within a matter of hours. Equipped with advanced sensors and AI algorithms, the system can precisely identify potential risks and perform remote fault diagnostics, further enhancing equipment reliability and operational efficiency.



9.3.4 Smart Call Centre



During the year, CEM participated for the first time in the Global Artificial Intelligence Machines and Electronics Expo, where it officially launched and showcased its new intelligent voice robot system. CEM became the first enterprise in Macao to introduce advanced artificial intelligence technology based on large language models into its customer service system. The intelligent voice robot integrates artificial intelligence with large language model technologies, enabling the provision of 24/7 multilingual smart services to the public. Leveraging CEM's proprietary knowledge base, the system is capable of delivering accurate and tailored responses to customer enquiries.

For CEM, the introduction of the intelligent voice robot has not only optimised human resource allocation, but also established a continuously evolving knowledge base that provides real-time insights to support management decision-making, thereby enhancing service efficiency and customer satisfaction.

9.3.5 Smart Meters and Data-Driven Operations

To support the Macao SAR Government's efforts to accelerate the realisation of its smart city development goals, CEM has in recent years actively invested resources in promoting smart services. The full deployment of smart meters has officially ushered in a new mode of energy management.

As of the end of the reporting period, CEM had installed more than 280,000 smart meters, which have been applied to automated remote meter reading and billing for residential, commercial and industrial customers across Macao. Smart meter data has also been widely applied to tasks such as analysing electricity supply applications, detecting abnormal electricity usage and forecasting load demand, thereby enhancing the accuracy of electricity management and the efficiency of energy conservation and emissions reduction.

In addition, CEM has introduced a daily consumption analysis feature in the "CEM APP", allowing customers to conveniently access their electricity usage over the past 30 days, thereby enabling them to adjust consumption habits and reduce electricity expenses.

Looking ahead, CEM will continue to leverage smart meters and related systems to significantly enhance synergies across various business areas, further contributing to the transition towards carbon neutrality and sustainable development.



9.4 Zero-carbon Infrastructure

CEM continues to advance the application of energy storage technologies and energy data management. For example, research is being conducted at substations and generation facilities on solar-plus-storage and energy storage solutions, and a feasibility study is underway on using energy storage systems as black start power sources to enhance the power system's restoration capability and overall resilience during emergencies and extreme weather events. At the same time, the Company is gradually establishing a carbon emissions data management platform, which supports energy management and decarbonisation decision-making through data analytics, while leveraging smart grid and digital technologies to improve energy utilisation efficiency and the integration of renewable energy. Moreover, we are working in alignment with government energy policies to study green electricity and green certificate mechanisms, exploring ways to increase the share of clean energy in power supplied to Macao, thereby supporting the SAR's long-term low-carbon energy development.

9.4.1 Upgrade of the Electric Mobility Charging Network

Against the backdrop of the Macao SAR Government's promotion of green mobility policies, CEM continued in 2025 to actively expand and upgrade the public electric vehicle charging network. A dual-standard (European and Chinese standards) electric motorcycle charging system was introduced, and compatibility tests for all European and Chinese standard vehicle models have been completed. This initiative implements a "one parking space, two standards" charging configuration, enhancing the adaptability of charging facilities to different vehicle types and meeting the charging needs in daily public car parks and street scenarios. It further improves the service level and reliability of Macao's public electric mobility charging network.

As of the end of the reporting period, the total number of charging points for electric vehicles and electric motorcycles across Macao has exceeded 3,000. During the year, the Company launched a trial of the "Plug-and-Charge" function, which simplifies the user charging process. After a one-time binding, vehicle owners can simply plug in to charge, reducing scanning and waiting time, and enhancing overall convenience. By the end of the reporting period, this function had been piloted in multiple car parks, covering 48 public car parks with a total of 102 charging spaces, and a cumulative 1,134 charging sessions had been completed.

CEM has also been gradually optimising the operation management and technical configuration of the charging network, including strengthening the operational monitoring functions of charging equipment and improving the information and communication support capabilities of the charging system. By continuously enhancing system stability and management efficiency, the Company is committed to providing more reliable and convenient charging services for electric vehicle and electric motorcycle users, while supporting Macao's transportation sector in its electrification and low-carbon development.

9.4.2 Photovoltaic Power Generation Systems

CEM is committed to promoting the use of green energy in Macao and actively aligns with the "Regulation for Safety and Installation of Solar Energy PV Interconnections" set by the Macao SAR Government, connecting customers' photovoltaic (PV) power generation systems to CEM's grid. By installing bidirectional electronic meters to record the electricity fed into CEM's grid, the Company purchases the electricity generated by PV systems at the feed-in tariff.

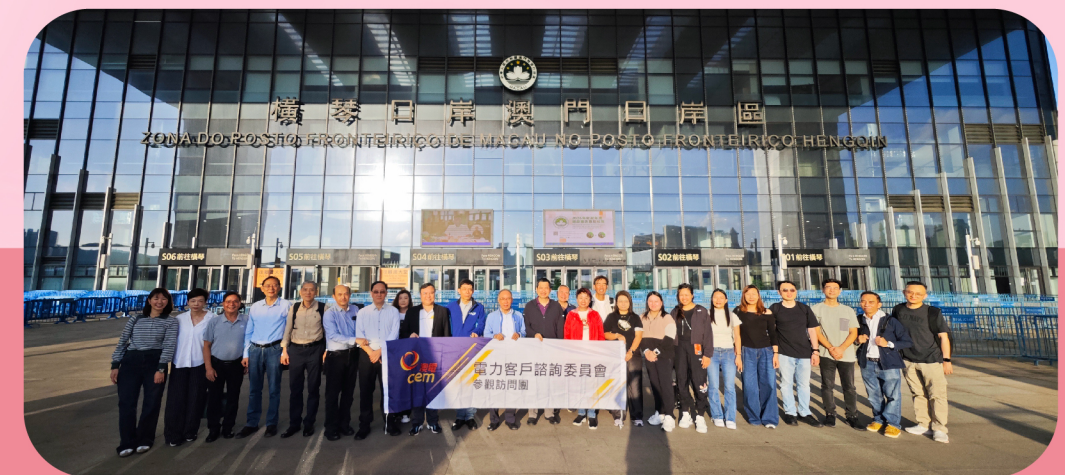
The Company continues to support the use of green energy in Macao, ensuring compliance with the standards and requirements of the regulations by connecting customers' PV systems to the grid. As of the end of the reporting period, 12 solar PV systems have been connected to the grid in Macao, with a total installed capacity of 4,193 kWp, generating over 6 GWh of green electricity cumulatively. In 2025 alone, a total of 2,889 GWh of electricity was produced.

In addition to supporting external projects, CEM is also advancing photovoltaic (PV) applications within its own facilities, exploring the feasibility of different technological pathways. CEM's Generation Department has launched a floating photovoltaic project on the reservoir at the Coloane Power Station. The design capacity of the photovoltaic system is approximately 868.64 kWp, and a fixed photovoltaic system has been installed concurrently. The electricity generated by these systems is primarily used to power the station's auxiliary systems and support day-to-day operations, thereby helping to improve energy efficiency and reduce operational carbon emissions.



Through cross-departmental collaboration, CEM provides technical support to customers interested in developing solar projects, including recommendations on grid connection solutions, system planning and energy assessments. By integrating smart meters and power monitoring technology, CEM assists businesses in optimising their energy management. These efforts help enhance the safety and reliability of grid connections for distributed photovoltaic systems and facilitate the gradual establishment of a local green energy ecosystem.

In terms of external engagement, CEM organised a visit for members of the Customer Liaison Committee to Xinjiang during the year to study new energy projects. Participants conducted site visits to a power dispatch and control centre, photovoltaic power plants and wind farms, and engaged in exchanges on the planning, operation and system management of renewable energy. These activities helped enhance the understanding of local enterprises and stakeholders regarding renewable energy projects and power system operations, providing valuable reference for promoting the adoption of clean energy and strengthening energy collaboration.



9.4.3 Common Services Tunnel

With regard to the contract for the “Design, Supply and Installation Services of the Common Services Tunnel Auxiliary Systems of New Urban Zone A”, signed between CEM and the Macao SAR Government in 2023, the Public Works Bureau has handed over the project to CEM for the installation of the ancillary systems. For the sections already handed over, CEM has completed the installation of all major ancillary systems of the common services tunnel within the year.

CEM continues to promote the application of trenchless technologies such as Horizontal Directional Drilling (HDD) to reduce road excavation, enhance project efficiency, and minimise environmental impact. In new urban development areas, CEM continues to adopt the common services tunnel approach, integrating utility pipelines such as electricity, water, and telecommunications to further enhance overall infrastructure performance. With ongoing technological innovation, the Company is also actively exploring the advanced application of artificial intelligence and robotics in live grid inspection and condition monitoring. By focusing on high-frequency data acquisition and analysis, CEM aims to provide more precise data support for future power grid management and operations.

9.5 Emergency Preparedness and Cross-Regional Coordination

9.5.1 Emergency Plans

CEM has established a comprehensive emergency security control and risk management framework covering both physical and cybersecurity domains. The overall framework is coordinated by the Executive Committee, with a structured division of responsibilities among the Safety Steering Committee, the Chief Security Officer / Deputy Chief Security Officer, as well as the Information Security Team and the Physical Security Team. This forms a top-down emergency management system, ensuring the rapid identification, coordination, and response to various security risks during emergencies or major events.

To effectively respond to information security and operational emergencies, CEM has established internal policies such as Crisis Management and Emergency Planning and Response, which define the principles for developing emergency plans and incident handling procedures, ensuring that response actions are carried out in an orderly manner under established governance structures and unified standards. Each asset management department is responsible for identifying potential emergency risks and incident scenarios, classifying events according to their level of impact, and formulating corresponding emergency plans accordingly. These plans clearly define activation mechanisms, reporting procedures, and response measures.

The relevant emergency plans cover personnel evacuation arrangements, the allocation of emergency equipment and resources, system backup, and power restoration mechanisms, ensuring prompt response and rapid power recovery in emergency situations. Through regular training and annual emergency drills, CEM verifies the feasibility and effectiveness of these plans, and continuously refines its emergency management measures based on review outcomes, thereby enhancing the overall resilience and reliability of the power grid.

In 2025, CEM also conducted an annual emergency drill for sudden environmental incidents, simulating a waste oil leakage scenario at fuel storage facilities in a power plant. The drill covered procedures such as on-site initial containment, activation of incident reporting mechanisms, coordinated inter-departmental response, and communication with regulatory authorities. It also tested the allocation of emergency resources and emergency procurement mechanisms. Through this exercise, CEM further reviewed its response procedures and inter-departmental coordination arrangements for environmental emergencies.

The Company also maintains close collaboration with relevant departments of the Macao SAR Government, aligning with civil protection mechanisms and participating in joint exercises to ensure orderly resource deployment and rapid response in emergency situations, thereby maintaining a stable power supply for the community and the public.

9.5.2 Power Supply for Major Events



In 2025, a number of major national and regional events were held in Macao. To ensure the smooth execution of these events, CEM developed dedicated power supply assurance plans in advance and maintained close coordination with relevant departments of the Macao SAR Government and event organisers, providing stable technical support and on-site power supply assurance.

For key venues, we enhanced power supply capacity by installing a second power source and medium-voltage equipment, enabling the power supply system to meet the N-1 redundancy configuration, thereby further improving reliability. At the same time, CEM deployed seven mobile battery energy storage systems (BESS), capable of providing an uninterrupted power supply of 1,360 kW at full load for up to two hours, strengthening emergency support capabilities.

During the power supply assurance period, CEM suspended non-essential equipment maintenance to ensure that generating units remained on standby, and implemented a 24-hour duty system, with sufficient emergency repair materials and fuel reserves in place. On the eve of the events, cross-departmental emergency drills and full-load testing were conducted. CEM also carried out joint exercises with the Guangdong Power Grid, comprehensively enhancing the power grid's emergency response capability and operational stability under extreme conditions.

9.5.3 Power Emergency Response Plans and Cross-Regional Coordination



In response to the challenges posed by extreme weather and unforeseen incidents, CEM has established a comprehensive emergency management system covering “pre-incident prevention, in-incident response and post-incident restoration”, thereby significantly enhancing the resilience of the power grid and the stability of the electricity supply.

We have developed four core emergency plans addressing major power outages, extreme weather, storm surges, and environmental incidents, which are regularly updated and exercised. Drawing on the lessons learned from the impacts of Super Typhoon Hato (2017) and Super Typhoon Mangkhut (2018), we have optimised flood protection measures for equipment and zoned power restoration procedures. At the same time, through preventive maintenance and risk identification mechanisms, we aim to minimise potential system failure risks.

In terms of regional coordination, CEM actively participates in the Guangdong-Hong Kong-Macao Power Emergency Response Mechanism under the government's civil protection framework. Support arrangements have been established with China Southern Power Grid, Guangdong Power Grid, and CLP Power Hong Kong, ensuring that cross-regional coordination can be rapidly activated under extreme conditions, thereby further strengthening power supply assurance capabilities.

9.5.4 Extreme Weather Drills and Response

In response to the extreme weather risks posed by climate change, CEM strengthened cross-departmental coordination mechanisms in 2025 and conducted joint typhoon drills in April. These exercises simulated power outages caused by severe flooding in low-lying areas, comprehensively testing the power outage and restoration procedures under the “Flood Emergency Response Mechanism”.

The preparatory measures were put to the test during Typhoon Ragasa in September. Through the coordinated operation of repair crews and the dispatch centre, the Company effectively ensured stable grid operation, enhancing overall flood response capability and system resilience.



9.5.5 Guangdong-Hong Kong-Macao Coordination: Building a Unified Power Security Front



CEM actively participated in the 5th Joint Meeting of the Power Emergency Response Mechanism for the Guangdong-Hong Kong-Macao Greater Bay Area (GBA), strengthening collaboration and information exchange with regional power entities to enhance cross-regional support capabilities.

For major events such as the 15th National Games, the Company worked with regional partners to develop coordinated power supply assurance plans, improve the joint response mechanisms and emergency arrangements, and establish a regional power security network, thereby further enhancing the reliability of electricity supply during large-scale events.

9.6 Cybersecurity and Data Protection

9.6.1 Ensuring Network Security

In advancing digital transformation and safeguarding critical infrastructure, we regard legal and regulatory compliance as the cornerstone of our cybersecurity framework. We strictly adhere to the Macao CyberSecurity Law, actively fulfilling the legal responsibilities of a critical infrastructure operator, and incorporate international standards into our daily management practices. By establishing corporate Information Security Management Systems and related management procedures, we have developed a standardised and continuously optimisable framework for security and service management, and have obtained international certification under ISO 20000-1:2018 for Information Technology Service Management Systems.

To achieve the core objectives of cybersecurity, CEM has established the “ITSC Corporate Information Security Policy” and the “Cyber Security Management Policy”, ensuring that security governance is structured and well-documented. We have appointed a dedicated Chief Information Security Officer to lead the cybersecurity team, and under the governance framework of the Security Steering Committee, oversee related initiatives. The officer is responsible for overall operational and technical decision-making, integrating the cybersecurity framework into the Company’s long-term development plans.

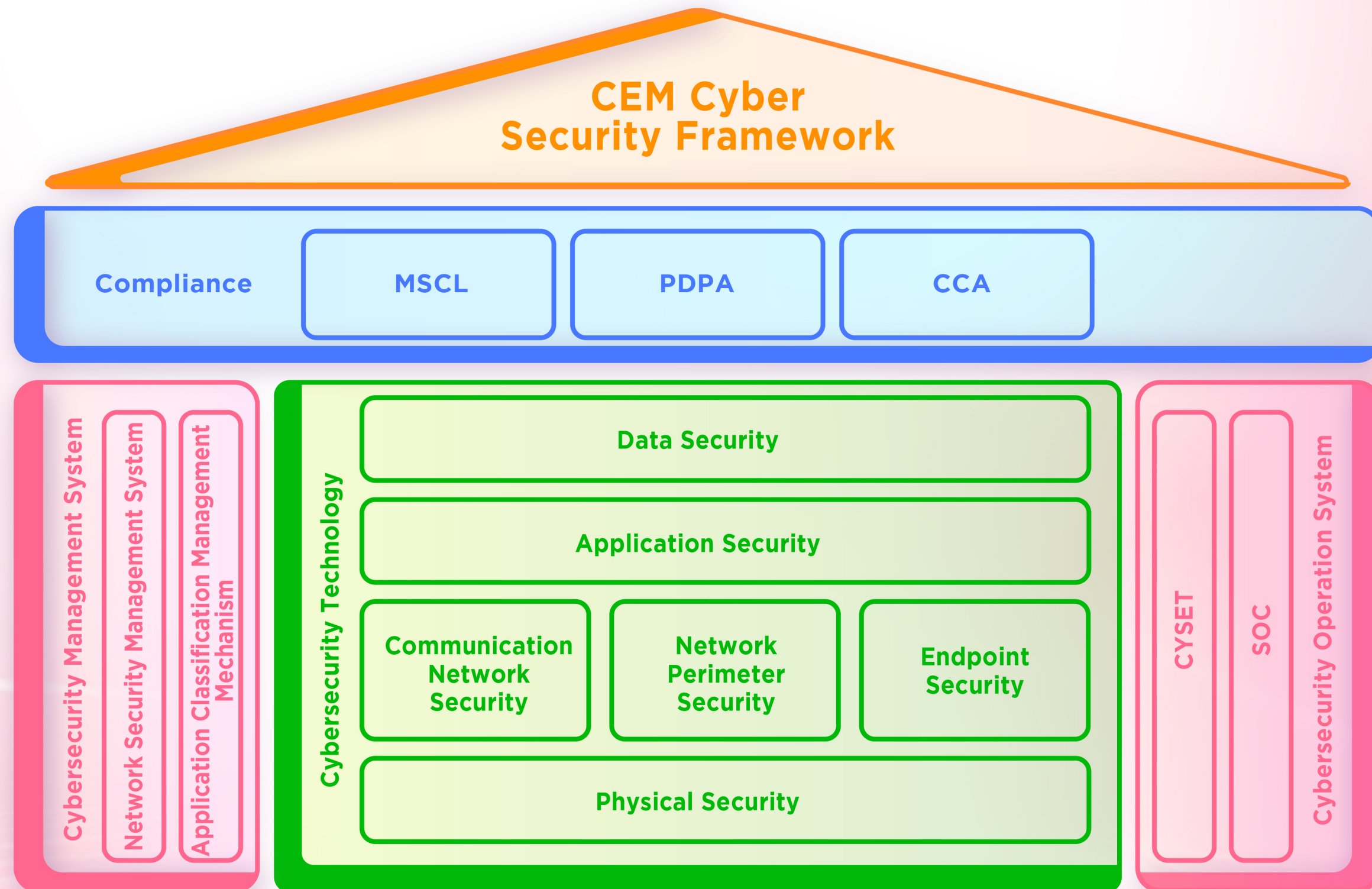
CEM has incorporated explicit cybersecurity clauses and responsibilities into its cooperation agreements, requiring service providers to conduct security self-assessments and ensure that the hardware, software, and services they provide comply with relevant security standards, thereby mitigating cybersecurity risks within the supply chain.

We implement technical measures such as Intrusion Prevention Systems (IPS), Endpoint Detection and Response (EDR), and application whitelisting to enable real-time monitoring of the network environment, supported by data visualisation tools for incident analysis and decision-making. The Company also applies artificial intelligence in a controlled manner as an auxiliary analytical tool to enhance threat detection efficiency and response capability. In addition, CEM continuously advances data centre expansion, firewall updates, and backup system upgrades, and regularly conducts network scans and penetration testing to ensure that all digital services operate stably within a secure and controlled conditions.

9.6.2 Cybersecurity Incident Management

Cybersecurity Incident Management is regarded as a key pillar for maintaining CEM’s supply stability and data security. In accordance with the current cybersecurity management system and emergency plans, CEM has established a comprehensive closed-loop framework covering prevention, detection, response, and post-incident improvement, designed to ensure rapid system recovery in the face of unforeseen threats and to minimise potential damage.

CEM has established a clear cybersecurity organisational structure, centred on the Information Systems Department. In the event of a major security incident or crisis, the CEM Crisis Management Team is activated in accordance with the “Crisis Management Guidelines”, coordinating with the Executive Committee for cross-departmental deployment. This multitiered structure ensures efficient decision-making and clearly defines the specific responsibilities of personnel from technical staff to management during emergency situations.



9.6.3 Customer Data Protection

CEM strictly complies with the Macao Data Protection Law and has established a comprehensive data governance framework to ensure that customer personal data is handled securely and in accordance with regulatory requirements throughout its collection, storage, and use. During the integration with the government “Macao One Account” platform, CEM employs TLS encryption protocols and certificate-based authentication to secure data transmission and prevent unauthorized access.

In terms of internal controls, CEM provides personal data protection training to Customer Service Department staff and relevant personnel, and implements real-time access controls and permission audit mechanisms to ensure that only authorised personnel can access sensitive information on a need-to-know basis. At the same time, CEM adopts a full lifecycle customer data management approach, establishing regular data cleansing procedures for historical records with no ongoing business relevance, thereby reducing the risks associated with long-term data retention.

CEM has implemented a “No SMS Links” policy to reduce phishing risks at the source. In 2025, no complaints regarding customer privacy breaches were recorded.

9.6.4 AI-enabled Cybersecurity

CEM continues to advance the application of data-driven approaches and artificial intelligence in cybersecurity management, gradually shifting from a traditional reactive model to proactive prevention and real-time monitoring. The Company has established a multi-layered protection framework, deploying next-generation firewalls and situational awareness platforms with deep learning capabilities to enhance the detection of unknown threats and anomalous behaviour. According to 2025 technical test results, these systems achieved a 100% success rate in threat detection and defense, while providing real-time alerts.

At the endpoint protection (EDR/XDR) level, we have introduced artificial intelligence technologies based on behavioural analysis, overcoming the traditional reliance on virus signatures. These technologies can identify anomalous patterns during program execution, effectively countering variant ransomware and unknown attacks. Through data correlation analysis and visualisation tools, the security team can trace and reconstruct approximately 99% of attack paths, enhancing risk identification and incident response efficiency.

CEM applies artificial intelligence technologies to automate security operations, handling approximately 1,300 cyber probes and security incidents daily, thereby reducing the monitoring burden on personnel and enhancing overall response efficiency. At the same time, we promote the use of digital tools within a unified information security governance framework, ensuring that all innovative technologies operate under controlled risk and compliance conditions, achieving a balanced development between technological innovation and information security management.

9.6.5 Industrial Control System Upgrades and Cyber Defence Drills



To strengthen the protection of power infrastructure, CEM fully advanced Industrial Control System (OT) upgrades and reinforcement projects in 2025, completing hardware updates to the SCADA system, significantly enhancing grid operation monitoring capabilities and the stability of the dispatch centre.

In terms of operational preparedness, CEM conducted a series of cyber-attack and defense drills, including the “2025 Annual Cybersecurity Incident Exercise”, and participated in Macao’s “Bright 2025” Cybersecurity Attack and Defense Drill, jointly organised with INTERPOL, local law enforcement authorities, and technical teams from multiple enterprises to carry out practical attack-and-defense testing. These exercises simulated complex cyberattack scenarios to evaluate the performance of firewalls, XDR, and AI-powered situational awareness systems, while identifying potential risks in areas such as configuration management, access control, and internal network protection. Through robust governance and continuous training, CEM achieved zero major cybersecurity incidents throughout the year, further strengthening the security of critical infrastructure.

9.6.6 Promoting a Safety Culture and Enhancing Security Awareness

CEM is committed to fostering a safety-first corporate culture and, through structured and continuous communication and training mechanisms, systematically enhances employees’ awareness and response capabilities in both physical and cybersecurity. In 2025, we leveraged multiple internal channels, including email, internal publications, WeCom and corporate TV, to regularly disseminate safety information. Topics covered included phishing email identification, office safety and everyday cybersecurity practices, helping employees build fundamental awareness of protective measures and further strengthening overall safety awareness.

Building on this, we further strengthened employees’ ability to identify and respond to potential risks through thematic briefings, case studies and training assessments, while promoting internal communication and knowledge sharing through regular cybersecurity meetings. These measures help integrate safety requirements into daily work processes and foster a company-wide culture of safety participation.