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RESTRUCTURING OF GLOBAL ENERGY AND POWER LANDSCAPE

Key Characteristics of Global Energy and Power Restructuring

Fueled by global dual-carbon imperatives, the global energy landscape is undergoing profound systemic reshaping. As the cornerstone of clean energy transition, power elevates its strategic stature and underpins the in-depth energy revolution. Booming expansion of emerging sectors including AI and new energy vehicles fuels rigid incremental growth in global electricity demand. Global power consumption is expected to rise from 30,082.9 TWh in 2025 to over 35,800 TWh by 2030. The global power system is therefore undergoing comprehensive structural reshaping from power generation to consumption, featuring the following dynamics.

Power Generation: Structural Transition of the Global Power Mix

The global energy mix is transitioning from fossil fuel dominance to large-scale integration and deployment of new energy such as PV and wind power. Global electricity generation of PV and wind power increased from 2,433.7 TWh in 2020 to 5,388.7 TWh in 2025, representing a CAGR of 17.2%, and is expected to reach 10,314.7 TWh by 2030, representing a CAGR of 13.9% from 2025 to 2030. Meanwhile, their share in global electricity generation expanded from 9.0% in 2020 to 16.7% in 2025, and is expected to reach 27.1% by 2030.

Power Consumption: System Evolution and Tech Iteration Facilitate Market Mechanism

Against the backdrop of the rapid expansion of renewable power generation, traditional power systems face constraints in the flexible integration of diverse energy sources and cross-regional resource deployment. This gives rise to structural challenges, including insufficient dispatchable capacity and immature market mechanisms, thereby suppressing energy utilization efficiency. To address these pain points, the power demand side is undergoing structural transformation, shifting from real-time consumption toward on-demand dispatch, supported by digitalization and AI-powered upgrades in system operation and market frameworks.

The operation of power consumption system is shifting toward a storage-prioritized model, driven by the increasing penetration of flexible resources such as energy storage. This upgrade in operational paradigm presents distinct pathways on the utility side and the user side.

- *Utility Side:* Large-scale deployment of centralized energy storage facilitates the flexible transition of power grids toward supply-demand balancing. Grid-side energy storage stations can accommodate cross-regional renewable integration and grid peak shaving requirements, participate in spot market arbitrage and ancillary service transactions, and thereby capture diverse revenue streams.

- *User Side:* DES has evolved into the core revenue-generating asset. China's cumulative installed capacity increased from 1.2 GWh in 2020 to 29.2 GWh in 2025, and is projected to reach 245.9 GWh by 2030, with a CAGR of 53.1% from 2025 to 2030. Driven by growing deployment scale, it creates tangible economic value through multiple channels, including peak-valley arbitrage, electricity market participation, and grid demand response engagement, underpinned by substantial market potential.

Power consumption is evolving from passive demand to flexible, interactive grid participation, thereby stimulating the development of the retail electricity service market. As traditional electricity trading service models result in energy waste due to mismatches between supply and demand in time and space, electricity trading is evolving toward an "energy storage plus trading" paradigm, transitioning from long-term contracts to a multi-layered system integrating spot markets, real-time balancing, and ancillary services, significantly improving efficiency and liquidity.

Modern Power System Construction: A Strategic Initiative for China's Power Sector Transformation

Features and Challenges of Traditional Power System in China

Compared with decentralized and regionalized grid models adopted in many overseas markets, China's power system features a nationally unified power grid, characterized by three key attributes: (i) centralized dispatch and control, (ii) long-distance transmission infrastructure, and (iii) unidirectional energy flow mechanism where the grid primarily serving as a transmission channel rather than a flexible and interactive platform.

China's power system faces a key challenge: power supply and demand do not match across different regions and time periods. For example, there were structural power supply-demand imbalances in 15 out of 31 provinces in China in 2025, which means the annual power generation volume is lower than the annual power consumption volume within these regions, according to the data released by national and local statistical bureaus. This imbalance stems from the dual structural transformation of the energy supply mix and end-user power demand.

- *Energy Supply Side:* New energy has evolved into a core component of power supply mix. In 2025, China's PV and wind power generation reached 2,300.0 TWh, accounting for 21.7% of total generation, and is expected to reach 35.0% by 2030. However, the intermittency and volatility of new energy generation are inherently mismatched with the demand-side requirement for a stable and reliable power supply.

- *End-User Demand Side:* The system remains constrained by a passive consumption model, limiting overall flexibility, which is reflected in the following:

  (i) Gap between power demand and system flexibility: Driven by energy-intensive industries and large power loads such as AI infrastructure, electric vehicles and advanced manufacturing, China's total electricity consumption surpassed 10,000 TWh in 2025 and is expected to reach 13,098.0 TWh by 2030, representing a CAGR of 4.8%. However, the shortage of flexible power resources and weak resource integration limit real-time supply adjustment, making peak-time power supply tighter.

  (ii) Poor transmission of price signals amid regional and time-based imbalances: Power demand differs greatly across regions and time periods. Current pricing mechanisms cannot fully reflect such time-and-location value of electricity. In addition, cross-regional transaction barriers and delayed price signals restrict users from optimizing their power consumption behaviors.

(iii) Insufficient utilization of flexible resources: DES, adjustable loads, and other distributed resources are not effectively integrated or fully utilized. This results in a lack of flexible capacity to accommodate renewable power integration, and further worsens the imbalance between power supply and demand.

Definition and Core Elements of Modern Power System

A modern power system is an electricity system aligned with energy transition and carbon neutrality goals, characterized by cleanliness, low-carbon development, supply-demand coordination, flexibility, and intelligence. It covers the full industrial chain including power generation, transmission, distribution, end consumption and energy storage, and relies on two fundamental pillars: (i) new power infrastructure, such as renewable energy stations, advanced transmission facilities, and distributed energy resources, and (ii) intelligent power hub, which is an intelligent software platform enabling adaptive coordination across system dispatching, grid scheduling, electricity trading, and VPP aggregation.

Value of Flexible and Interactive Loads in Modern Power System Transition

Flexible loads, typically represented by DES, have evolved from passive consumption units into active participants and system stabilizers. Characterized by controllability, rapid response, and real-time regulation, flexible loads support dynamic adjustment and can be aggregated to form scalable flexible capacity. Their core functions are reflected in three aspects:

- Alleviating the intermittent and fluctuating characteristics of renewable energy generation, and supporting real-time supply-demand balancing;
- Connecting electricity users with power markets to unlock economic benefits; and
- Serving as emergency power sources to enhance the overall operational resilience of the power system against extreme conditions.

The large-scale deployment and operation of such flexible resources is essential to modern power system and will drive a fundamental shift in operating paradigms of power system.

EVOLUTION OF CHINA'S MODERN ELECTRICITY SERVICE INDUSTRY

Activation of Modern Electricity Services Driven by Power System Restructuring

Traditional electricity services focus on ensuring long-term stable power supply, emphasizing electricity metering, billing, and basic operation and maintenance. This operating model features one-way power delivery between power supply and demand entities, and fails to create incremental value through data empowerment and market-based mechanisms. Under the transition to modern power system, grid architecture is evolving from a centralized model to a three-tier structure of main grid, distribution network, and intelligent microgrid. This evolution enables flexible and interactive operations of the power system and transforms user-side distributed assets into critical stabilizing resources for the power system.

Accordingly, end-user electricity services are undergoing a fundamental shift toward value-based operation, forming a modern service model built on dispatchable power assets, aggregated resource optimization, and intelligent electricity trading. The core value of dispatchable power assets is manifested in: (i) activating the value of decentralized energy resources to enhance asset returns; (ii) enabling electricity users to participate in the electricity market thereby improving the efficiency of resource allocation; (iii) engaging user-end resources in demand response to supplement the flexible regulation capability of modern power system and accommodating the volatility and intermittency of new energy generation.

Definition and Core Components of Modern Electricity Services

Modern electricity services refer to an emerging model that activates, aggregates, and optimizes dispatchable user-end power assets. By leveraging AI technologies, it provides comprehensive services — including energy asset operation and electricity trading — to help users reduce energy costs and increase asset returns. At the same time, it supports the safe and stable operation of the power grid and the consumption of renewable energy, ultimately maximizing the value of aggregated resources.

Key dispatchable user-end power assets include DES, distributed PV, distributed wind power, EV charging points, and other flexible loads. Compared with other assets, DES plays a unique role due to its real-time bidirectional regulation capability through its massive deployment at physical power nodes of electricity users, mainly in industrial and commercial scenarios. The core value of modern electricity services based on DES assets lies in converting the technical potential of DES into sustained system value and economic returns, thereby improving overall system efficiency.

Business Model and Market Size of Modern Electricity Services

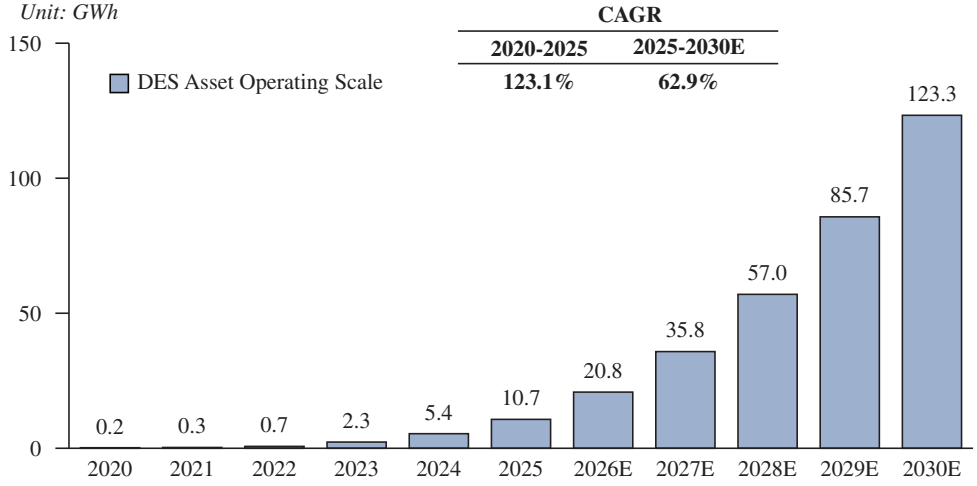
DES Asset Operation Serves as the Cornerstone of Value Capture

Modern electricity service industry is currently at its early development stage, with its business models covering DES asset operation and electricity trading. At present, DES asset operation dominates the market. DES asset operation refers to the professional management and operation of DES for electricity users, enabling efficient utilization of DES assets in power supply-demand balancing, supply stability, and cost optimization. Its core activities include leveraging energy management systems to formulate intelligent charge-discharge strategies based on power market signals, user load dynamics, and new energy generation, as well as conducting routine inspections, maintenance, and fault response to ensure stable lifecycle operation and sustained performance of DES assets.

Market Size of DES Asset Operation Services

The market size of China's DES asset operation services in terms of DES asset operating scale increased from 0.2 GWh in 2020 to 10.7 GWh in 2025, representing a CAGR of 123.1%. As a core carrier enabling temporal and spatial energy shifting and flexible system regulation, DES assets meet the fundamental demand for building a modern power system, achieving rapid growth in penetration across multiple scenarios and driving the industry toward robust expansion. The market size of China's DES asset operation services is expected to maintain rapid growth, reaching 123.3 GWh by 2030, representing a CAGR of 62.9% from 2025 to 2030.

Market Size of DES Asset Operation Services in China
(in terms of DES asset operating scale, 2020-2030E)



Source: expert interviews, CIC

Electricity Trading Acts as the Core Engine for Value Upgrading

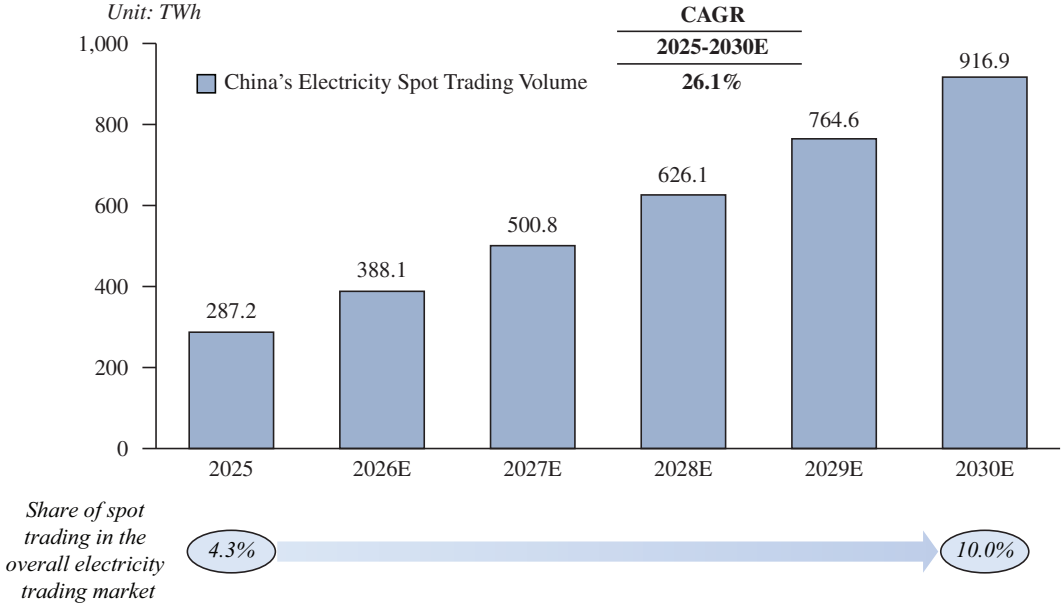
Introduction of Traditional Electricity Trading Service Market

Electricity trading refers to market-based transactions of electricity among various participants through mechanisms such as bilateral negotiation, centralized bidding, and listing trading. The market size of China's electricity trading services in terms of trading volume reached 6,639.4 TWh in 2025.

In terms of product type, traditional electricity trading service market can be mainly divided into two categories: (i) the medium and long-term (MLT) electricity trading services, which refer to electricity transactions over a relatively long period (months, quarters, or years) to achieve stable and long-term planning of power resources; (ii) electricity spot trading services, which refer to electricity transactions among various entities through market mechanisms to achieve short-term optimal allocation of power resources.

In 2025, China's electricity trading service market was dominated by MLT electricity trading services, with a share of over 95% of overall electricity trading service market in terms of trading volume. However, in order to address short-term imbalances between power supply and demand, the spot trading service market has been established. It enables effective demand adjustment through price signals, supports real-time grid balancing, and ensures stable operation of power system under high new energy penetration. In China, electricity spot trading markets in certain provinces (including Shanxi and Guangdong) entered formal operation by the end of 2023, and their share is expected to increase with the comprehensive advancement of spot market construction and rising demand for dispatchable resources including DES assets. The market size of China's electricity spot trading services in terms of trading volume is expected to grow from 287.2 TWh in 2025 to 916.9 TWh in 2030, representing a CAGR of 26.1%, and its market share of the overall electricity trading service market is expected to rise from 4.3% to 10.0% during the period.

Market Size of China's Electricity Spot Trading Services (in terms of electricity trading volume, 2025-2030E)



Source: National Energy Administration of China, CIC

DES-Based Electricity Trading Service and Ancillary Service Markets

As China's electricity trading system matures, trading products are expanding and pricing becoming more refined, which increases forecasting deviations and computational complexity. Leveraging refined energy asset management and AI-based price forecasting to manage rising complexity has become the core driver of value enhancement in the modern electricity service industry. Against this backdrop, DES-based electricity trading service and ancillary service markets have emerged since 2025, and the service types are shifting toward spot trading services and ancillary services enabled by VPP.

- DES-Based Electricity Spot Trading Services: As the share of electricity spot trading service market increases, trading cycles shorten, and system volatility rises due to higher penetration of new energy, trading complexity rises significantly. In this context, leveraging AI to capture spatiotemporal price differences has become critical to improving trading returns, and as the flexible trading units in the spot market, DES assets can achieve higher frequency of peak-valley arbitrage through AI-based price forecasting, thus enhancing the profitability and providing the power system with greater capability in flexible adjustment.

- DES-Based Ancillary Services Enabled by VPP: Ancillary services enabled by VPP refer to the aggregation of DES assets and other dispatchable resources through advanced information, communication, and control technologies, allowing them to participate in power system optimization as a unified entity and monetize their flexibility. VPP aggregates large-scale distributed assets into scalable flexible capacity, overcoming participation barriers for individual assets. Through AI-powered optimization and dispatch, they participate in ancillary service markets to achieve stable revenue streams and integrating distributed assets and electricity markets. In recent years, VPP has transitioned from conceptualization to large-scale deployment.

Going forward, DES-based electricity trading service and ancillary service markets will emerge as a high-potential model, paving the way for an integrated operation and trading model. In this process, companies with extensive dispatchable asset networks can respond efficiently to market signals while leveraging real-time operating data and AI algorithms to optimize trading strategies and reduce risks, thereby establishing data-driven competitive advantages and capturing market opportunities.

Market Drivers and Future Trends of China's Modern Electricity Service Industry

Rising Importance of Refined DES Asset Operation. By scientifically optimizing dispatch and operation of DES assets, the utilization rate and operating efficiency of energy storage assets can be enhanced, increasing the effectively utilized electricity volume and reducing the electricity losses, thereby directly lowering the fixed cost per kWh, ultimately enhancing the profitability and market competitiveness of market participants.

Deepening Application of AI and Advanced Technologies. AI is increasingly embedded across the value chain of modern electricity service industry, from forecasting and strategy optimization to resource dispatch, improving trading accuracy and operating efficiency. It also supports the forecast of electricity generation and market prices, automated trading strategies, and aggregation of distributed assets into VPP, which improves the transaction efficiency of the electricity market.

Supportive Policies. The PRC government has introduced a series of supportive policies to drive industry growth. For example, in April 2025, the NDRC and the NEA issued the *Guiding Opinions on Accelerating the Development of Virtual Power Plants* (《加快推進虛擬電廠發展的指導意見》), supporting broader participation in VPP construction and operation; in November 2025, the *Guiding Opinions on Promoting New Energy Consumption and Regulation* (《關於促進新能源消納和調控的指導意見》), which emphasizes that new entities such as DES assets, distributed energy assets, and VPP are encouraged to participate in electricity markets through aggregation and direct trading models.

Continued Improvement of Power Market Reform. Ongoing reforms, including expansion of spot markets, enhancement of ancillary service markets, and development of a national unified electricity market, are creating a more mature and efficient market and driving industry growth. Meanwhile, benchmark provinces such as Jiangsu, Zhejiang, Anhui, and Guangdong have formed differentiated leading practices in these fields.

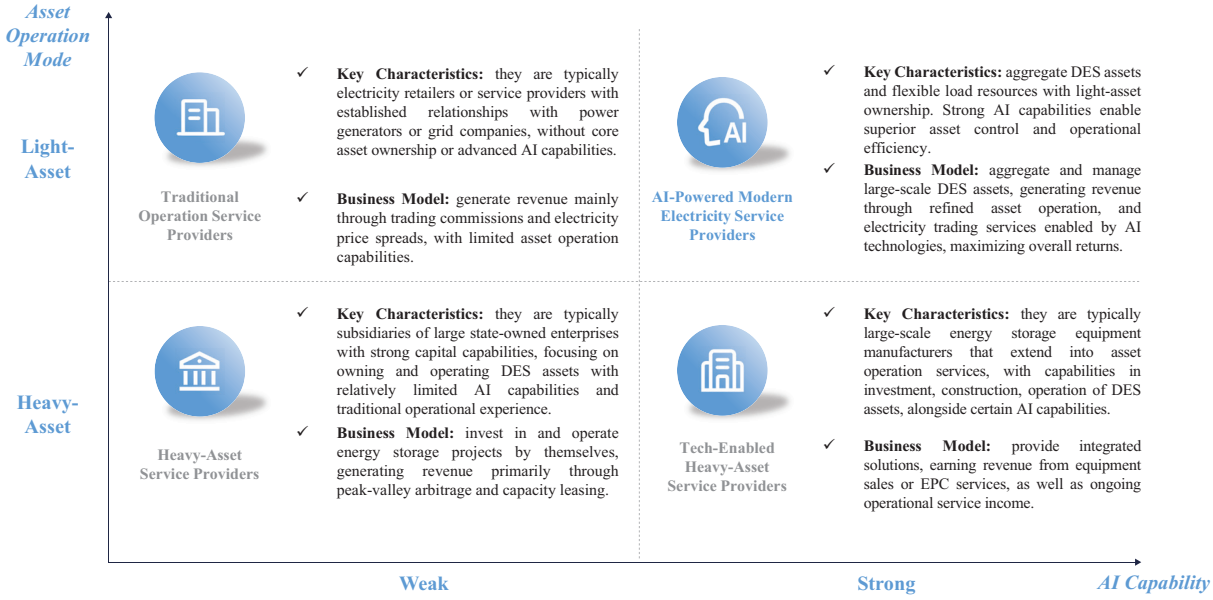
Shared Energy Storage System Emerging as a Dispatchable Resource. Shared energy storage system refers to independent energy storage plants constructed by a third party and shared by multiple participants, which can flexibly adjust power generation, charging, and discharging in response to grid instructions. Shared energy storage system establishes a more flexible matching mechanism between large-scale new energy resources and power demand, improving grid stability, which also enables the evolution of electricity service business toward diversified service models, including spot trading services and ancillary services.

COMPETITIVE LANDSCAPE OF CHINA'S DES-BASED MODERN ELECTRICITY SERVICE INDUSTRY

Classification of Market Participants of China's DES-Based Modern Electricity Service Industry

Market participants in China's DES-based modern electricity service industry can be classified into four major categories: AI-powered modern electricity service providers, tech-enabled heavy-asset service providers, heavy-asset service providers, and traditional operation service providers.

Major Types of Market Participants in China's DES-Based Modern Electricity Service Industry



Source: CIC

AI-powered modern electricity service providers including our Company adopt a light-asset model to rapidly aggregate fragmented user-end resources, avoiding the capital constraints of heavy-asset players. By leveraging AI technologies for precise dispatch and refined operations, they achieve more efficient and diverse value creation than traditional service providers. As a result, these players demonstrate differentiated competitiveness compared with other types of players, significantly improving asset utilization and returns, and establishing a new paradigm of light-asset and AI-powered platform in the industry.

Ranking of China's DES-Based Modern Electricity Service Industry

In 2025, China's DES-based modern electricity service market remained at an early stage of development. Our Company ranked first among these service providers in China in terms of DES asset operating scale with a market share of 7.4% as of December 31, 2025.

Ranking of China's DES-Based Modern Electricity Service Industry (in terms of DES asset operating scale, as of December 31, 2025)

Ranking	DES-Based Modern Electricity Service Providers	DES Asset Operating Scale	Market Share
		(MWh)	*(%)*
1	**Our Company**	**799.5**	**7.4%**
2	Company A	~775.0	7.2%
3	Company B	~760.0	7.1%
4	Company C	~700.0	6.5%
5	Company D	~620.0	5.8%
Total		**3,654.5**	**34.0%**

Notes:

(1) Company A is a private company founded in 2016. It is a subsidiary of a company listed on the Shanghai Stock Exchange, primarily engaged in integrated energy services, with businesses covering power distribution and retail, electricity trading, and distributed energy services.

(2) Company B is a private company founded in 2019, specializing in energy storage systems, with businesses covering DES assets operation and related smart energy solutions.

(3) Company C is a company listed on the Hong Kong Stock Exchange, founded in 2002, primarily engaged in integrated energy infrastructure investment and operation, with businesses covering natural gas supply and comprehensive energy services.

(4) Company D is a company listed on the Shenzhen Stock Exchange, founded in 1997, primarily engaged in new energy technology, with businesses covering PV inverters, energy storage systems and comprehensive smart energy solutions.

Source: annual reports, expert interviews, CIC

Entry Barriers and Key Success Factors of China's DES-Based Modern Electricity Service Industry

Integration of Electricity Trading Expertise and Strong Technological Capabilities. Modern electricity service providers must possess deep expertise in electricity trading service and the ability to integrate AI technologies into load forecasting, price prediction, and real-time trading optimization, forming a critical capability for effective market participation.

Accumulated Operational Data from Broad Electricity Users. Sustained access to and accumulation of high-quality and large-scale operating data from broad electricity users—covering load profiles, consumption patterns, and asset performance—enables modern electricity service providers to achieve more accurate price forecasting, asset dispatching, and trading strategies, which reinforces their service differentiation.

Asset Development and Operation Capabilities. Modern electricity service providers are required to establish large-scale, dispatchable asset networks and possess full-lifecycle asset operation capabilities, continually optimizing equipment performance, asset operations, and trading strategies to ensure stable returns.

Sustained Capability to Serve High-Quality Customer. High-quality customers in the industry typically feature stable and clear electricity demand for DES assets. Cooperation with such customers ensures stable project returns and facilitates the large-scale expansion of business operations. Meanwhile, the ability of service providers to continually deliver long-term DES value creation and cost savings can further strengthen customer loyalty.

Supply Chain Integration and Ecosystem Collaboration. Strong supply chain management ensures stable component supply and cost control; meanwhile, industry development relies on collaboration with state-owned enterprises, financial institutions, and other stakeholders to achieve resource complementarity.

COMPETITIVE ADVANTAGES OF LEADING CHINESE MODERN ELECTRICITY SERVICE PROVIDERS IN GLOBAL MARKET

Mature Overseas Markets with Higher Entry Barriers

Compared with China's market in the developing stage, overseas electricity markets are more mature, leveraging VPP and AI technologies to aggregate distributed energy resources and participate in electricity spot market and ancillary service market, thereby establishing diverse business models with clear value realisation pathways. In addition, overseas service providers use power operation data and AI to accurately forecast power supply-demand gaps, dynamically optimize charging/discharging and DES asset coordinated dispatch strategies, enhancing operating efficiency of DES assets and stability of electricity market. However, the entry barriers of overseas electricity markets remain high, requiring capabilities in technical standard adaptation, regulatory compliance, localized operation service networks, and competition from local players.

Leveraging China's Market Dynamics for Global Competitiveness

Supported by China's unique market characteristics, domestic service providers have strengthened their core capabilities, thereby establishing notable competitiveness in the global market.

- ***Market Scale Advantage.*** As the world's largest electricity consumption market, China accounted for 34.5% of global electricity consumption in 2025 and is also the biggest market for energy storage applications, enabling accumulation of large-scale asset management experience for service providers;

- ***Technology Advantage.*** Given its inherent intermittency and volatility, high penetration of new energy generation in China drives greater requirements for real-time power supply-demand balancing, prompting leading modern electricity service providers to achieve continued technological breakthroughs in price forecasting, AI-powered trading and dispatch, thereby strengthening their competitiveness in overseas markets;

- ***Cost-Effectiveness Advantage.*** China's mature industrial chain for distributed energy resources supports cost competitiveness throughout the asset lifecycle, driven by economies of scale and collaborative innovation.

SOURCE OF INFORMATION

CIC was commissioned to conduct an analysis of, and to report Global and China's modern electricity service industry at a fee of RMB700,000. The commissioned report has been prepared by CIC independent of the influence of the Company and other interested parties. CIC's services include industry consulting, commercial due diligence, and strategic consulting. Its consulting team has been tracking the latest market trends across various industries, where it has relevant and insightful market intelligence.

CIC conducted both primary and secondary research using a variety of resources. Primary research involved interviewing key industry experts and leading industry participants. Secondary research involved analyzing data from various publicly available data sources, such as the National Bureau of Statistics and other PRC governmental agencies' releases. The market projections in the commissioned report are based on the following key assumptions: (i) given China's enduringly stable political system, effective social governance and robust economic foundation, it is anticipated that the overall social, economic, and political environments in China will remain stable during the forecast period; (ii) according to the National Bureau of Statistics of China, key economic indicators such as gross Domestic Product (GDP), industrial added value, and urbanization rate have shown an upward trend in China over the past decade, and thus we believe that the economic and industry development in China is likely to maintain a steady growth trajectory during the forecast period, accompanied by continuing urbanization; and (iii) there will be no extreme force majeure event or unforeseen industry regulation that may significantly or fundamentally affect the relevant market and industry.

Unless otherwise specified, all data and forecasts contained in this section are derived from the CIC Report. The Directors have confirmed that there has been no occurrence of adverse change in the overall market information that would subject the data to significant restrictions, contradiction, or negative effects since the date of the CIC Report.