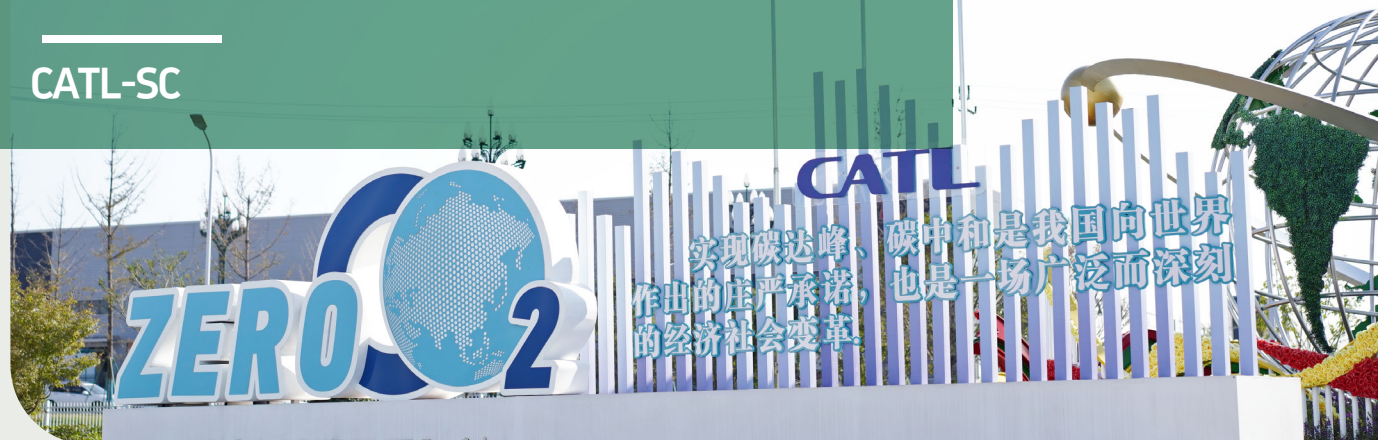


Zero Carbon and Intelligent Manufacturing: Two Engines Driving Sustainable Development

CATL-SC



PROJECT OVERVIEW

As the world's first zero-carbon factory in the lithium battery industry, a Global Lighthouse Factory, and a national benchmark for intelligent manufacturing, CATL-SC focuses on energy conservation and emission reduction, environmental protection, and intelligent manufacturing, with a commitment to sustainable development and promoting efficient use of energy and resources across its factories and supply chain. Since its launch, the company has achieved significant results in the fields of sustainable development and intelligent manufacturing:

Internal Operations for Emission Reduction:

1. Intelligent Digitalization of Production Energy Consumption (PES): By leveraging production big data, the system ensures intelligent, dynamic, and closed-loop management of energy consumption throughout the production process, enabling precise optimization of energy use and improving energy efficiency.

2. Smart Microgrid System Using Virtual Power Plants and Photovoltaic Storage & Charging Equipment: Combining big data cloud computing technology with advanced photovoltaic and storage facilities, this integrated system enables intelligent power dispatching, efficient utilization of renewable energy, and effective reduction of power-related carbon emissions.

3. Circular and Lightweight Packaging: Through innovative packaging technologies, material usage is reduced, resulting in a significant decrease in carbon dioxide emissions.

4. Intelligent Logistics System: By integrating 5G, AGV (Automated Guided Vehicles), and autonomous driving technologies, a highly efficient and secure logistics

distribution network is established.

Supply Chain Synergy for Carbon Reduction:

Zero-Carbon Transformation of the Supply Chain: Leveraging the opportunity of zero-carbon factory construction, CATL-SC drives its suppliers to join in the green transformation, promoting carbon neutrality across the entire value chain.

Through these innovative practices, CATL-SC has not only achieved its own green and low-carbon development but has also set a benchmark for sustainable development within the industry.

COMPANY/ORGANIZATION PROFILE



Sichuan Contemporary Amperex Technology Limited (referred to as "CATL-SC") is a subsidiary of CATL (Contemporary Amperex Technology Co., Ltd.), established in October 2019, located in the Sanchuan New District of Yibin City. The company has a total planned investment of 56 billion yuan, spanning 10 phases, covering an area of over 6,000 acres.

In March 2022, CATL-SC became the world's first battery zero-carbon factory by successfully obtaining carbon neutrality certification. It has continuously achieved carbon neutrality certification for four consecutive times, collaborating with industrial chain partners to establish a "1+9" zero-carbon industrial cluster and further expanding the zero-carbon ecosystem.

In 2022, the company was selected as a Global Lighthouse Factory for its application of 4IR (Fourth Industrial Revolution) technologies to empower lithium battery manufacturing, achieving global benchmarks in quality management, safety management, and logistics distribution. In 2023, it was awarded the titles of National Green Factory and National Intelligent Manufacturing Demonstration Factory. In 2024, it once again received the honors of National Intelligent Manufacturing Benchmark Factory and Provincial Quality Benchmark Enterprise in Sichuan Province.

CATL-SC leads the industry with its commitment to technological innovation and green development, becoming a global benchmark enterprise in lithium battery manufacturing.

PROJECT OUTCOME

CATL-SC actively responds to the national "dual carbon" goals and CATL's zero-carbon strategy, achieving significant results in production and manufacturing, waste recycling, logistics transportation, and supply chain management. It has set an industry benchmark in addressing climate change and protecting the ecological environment.

1. Energy Conservation and Emission Reduction: From 2022 to 2024, CATL-SC promoted 350 energy-saving and emission-reduction projects, achieving energy savings of 330 million yuan and reducing the carbon emission intensity per unit product by 25%.

2. Use of Renewable Energy: In 2024, the company increased its photovoltaic power generation by 19,875 MWh.

3.Circular Packaging Utilization: The company achieved 100% application of reusable packaging for domestic projects, increased the input quantity of reusable material racks by 84%, and reduced the weight of lightweight packaging by 26%.

4.Logistics Management in the Factory: Logistics automation increased by 131%, and carbon emissions from logistics vehicles within the factory were reduced by 100%.

5.Supply Chain Management: CATL-SC led its supply chain partners in completing certifications for 9 zero-carbon factories, achieving a total reduction of 713,400 tons of carbon emissions (including offsets). Through its actions, CATL-SC is actively practicing the national green development philosophy and CATL's zero-carbon strategy, providing a successful model for sustainable development in the industry.

PROJECT HIGHLIGHTS

Through the implementation of the aforementioned projects, CATL-SC has earned numerous accolades, demonstrating its exceptional performance in sustainable development:

World's First Zero-Carbon Factory
National Green Factory
National Intelligent Manufacturing Benchmark Factory
National May 1st Labor Medal
Sichuan Province New Economic Demonstration Enterprise
Outstanding Enterprise in Environmental Protection

PROJECT IMPLEMENTATION

Since its establishment, CATL-SC has actively promoted a series of key projects in the fields of sustainable development and intelligent manufacturing. Below are five representative project achievements:

1.PES Production Energy Consumption Digitalization Management

By combining AI intelligent algorithms, intelligent sensors, and wireless network real-time acquisition and transmission, IoT technologies can accurately match production plans with the actual on-site status, achieving precise matching of the number of equipment started on demand with the actual working conditions, and automatic equipment adjustment. From 2022 to 2024, the consumption of product coal bills will decrease from 2.46 kgce/kWh to 2.24 kgce/kWh, significantly improving energy utilization efficiency.

2.Smart Microgrid System Application

Through the factory intranet + smart gateway architecture, compatible with RS485 bus protocol and Ethernet communication, unified access to heterogeneous data such as production equipment, energy meters, and environmental sensors can be achieved. It can achieve millisecond-level device status query and second-level energy consumption data acquisition with multi-brand PLC/sensor protocol analysis, effectively enhancing power supply capacity, achieving multiple adjustment services such as intelligent peak adjustment, frequency modulation, standby, and digitally intelligent management of demand-side load resources. From 2022 to 2024, photovoltaic power generation will increase

from 0 to 19,875MWh, with energy storage and demand-side response revenues increasing by 1.5 million yuan.

3.Circular and Lightweight Packaging Application

By introducing recycled packaging instead of disposable packaging and adopting universal packaging and lightweight design, carbon reduction gains are achieved. From 2022 to 2024, the proportion of domestic project recycled packaging applications will increase from 65% to 100%, significantly reducing packaging waste and promoting the development of green supply chains.

4.5G, AGV, and Autonomous Driving Technology Application

With 5G communication technology and intelligent navigation systems, combining cloud services, WCS systems, and IOC large screen identification and logistics orders, the logistics needs of 8 major scenarios such as raw material receiving and dispatch, finished product receiving and dispatch, resource recovery area, and production workshop are fully covered. From 2022 to 2024, the logistics automation rate will increase from 35% to 81%, significantly improving logistics efficiency and safety.

5.Promotion of Zero-Carbon Factory Construction in the Supply Chain

As a benchmark for the certification of zero-carbon factories in the industry, CATL leads suppliers in building a zero-carbon transition. Through experience sharing, empowerment coaching, etc., priority is given to promoting the zero-carbon transition of local core suppliers and gradually expanding to the full supply chain. From 2022 to 2024, the number of certified supplier zero-carbon factories increased from 0 to 9, with a cumulative carbon reduction of 713,400 tons, promoting the overall green upgrade of the supply chain. Through the implementation of the above projects, CATL not only achieved green development in its own operations, but also established a benchmark for smart manufacturing and sustainable development for the industry, highlighting corporate social responsibility and innovative leadership.

PROJECT IMPACT & SUSTAINABILITY

Impact

CATL-SC actively explores AI big data technology to promote energy transition and digital optimization, passing the PAS2060 carbon neutral certification for four consecutive times, becoming the world's first zero-carbon battery factory. Through continuous innovation, it achieved a 13% annual reduction in carbon emissions per unit product, a 56% reduction in the carbon footprint of low-carbon product design, and promoted carbon neutrality for 9 core suppliers.

Replicability

CATL's smart manufacturing and energy-saving carbon reduction measures have been promoted within the group to various major production bases, and a standardized system has been formed to provide reference for newly built plants. Meanwhile, the company is committed to creating a zero-carbon ecosystem, leading 8 enterprises in the first-level supply chain of Sichuan to achieve carbon neutrality by 2023, creating a "1+9" zero-carbon industrial cluster.

Sustainability

CATL-SC places great emphasis on ESG sustainable development, establishing a Sustainable Development Committee in May 2023, comprised of a joint project team of multiple departments, responsible for implementing the group's sustainable development strategies, policies, and base-related regulations, policies, and standard requirements. In 2025, the Linhang Transition Zone has been selected as a zero carbon park in Sichuan Province, competing for a national-level zero carbon park; at the same time, in 2025, the Sanjiang New District will be selected as a national carbon-efficient pilot. In the future, CATL will continuously deepen ESG practices, constantly improving company competitiveness and social value.

Expert Comments

This case provides a systematic demonstration of the company's innovative practices and remarkable achievements in green and low-carbon transition. Focusing on smart energy management, circular packaging, intelligent logistics, and zero-carbon supply chains, it highlights the deep integration of digital technology with green and low-carbon development. Notably, the company has achieved multi-source data integration and intelligent regulation within its microgrid system and promoted zero-carbon certification among key suppliers, establishing quantifiable and replicable solutions. Through technological and managerial innovation, the case has effectively reduced carbon emission intensity in its production processes while proactively building a "1+9" zero-carbon supply chain ecosystem, generating strong industry-wide influence. The establishment of long-term mechanisms such as a Sustainable Development Committee has provided institutional support for ongoing actions, demonstrating strong potential for scalability and sustainable growth. This case offers valuable practical reference for advancing green and intelligent manufacturing in the industrial sector, particularly within the battery industry.