Analysis of Corporate Green Power Consumption Practices

Sino-Danish Green Power Programme

Guided by : MINISTRY OF FOREIGN AFFAIRS OF DENMARK Danish Energy Agency

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Disclaimer

This report does not constitute legal advice or professional services and should not be relied upon for purposes beyond its intended scope.

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1. Introduction

1.1 Background: The Sino-Danish Green Power Programme

As the energy sector evolves, with electricity increasingly generated by renewable energy sources connected to power grids, utilities worldwide are prioritising grid modernisation, efficiency improvements, the adoption of innovative solutions, and new operational practices. These steps aim to maintain and improve the uptake of renewable energy and reliability of electricity supply.

The Danish Energy Agency (DEA) has cooperated bilaterally with the National Energy Administration of the People's Republic of China (NEA) on green transition for 20 years. In 2023, both parties signed a new Memorandum of Understanding (MoU), agreeing to launch a new "Sino-Danish Green Power Programme."

The overall strategic goal of the collaboration between NEA and DEA is to "strengthen the mutually beneficial partnership in the field of clean energy and promote the transition of both countries toward low-carbon economies." The current project aims to promote mutual exchange and experience sharing between NEA and DEA.

In 2025, China's Green Electricity Certificate (GEC) system was further improved, helping to boost the dynamism of the domestic green electricity consumption market. Chinese and Danish

companies have actively participated in green electricity consumption, forming effective action mechanisms and practical experience.

Based on a review of the relevant institutional frameworks for green electricity consumption in both China and Denmark, this report presents cases of selected Chinese and Danish companies operating in China that actively implement green electricity consumption. It summarizes key experiences, identifies existing challenges, and proposes recommendations.

The report aims to provide enterprises with better solutions for green electricity consumption and to offer an important reference for the green transition of China–Denmark bilateral cooperation.

1.2 Regulatory framework

This section outlines the regulatory framework governing green electricity consumption in China, providing an overview of the GEC-related policies and institutional arrangements that shape how companies participate in the green transition. A separate section introduces the regulatory framework for green electricity procurement in Denmark and the European Union for reference. By tracing the evolution of these policies, the section highlights the regulatory pathways, compliance mechanisms, and market-based tools that enterprises must navigate as they increase renewable electricity consumption, meet consumption obligations, and advance corporate decarbonization efforts.

China's green power consumption regulation

To guide green consumption across society and promote the integration and utilization of clean energy, China began piloting a GEC issuance and voluntary purchase system in 2017. The state issued GECs for on-grid electricity generated by subsidized onshore wind power and centralized photovoltaic projects and clarified that users could purchase GECs as proof of green electricity consumption. In 2019, China clarified that wind and solar projects operating under subsidy-free parity (or low-tariff) grid connection arrangements are eligible to be issued GECs, allowing developers to generate revenue through the sale of these certificates. Starting in 2020, China implemented a renewable energy power consumption guarantee mechanism, clarifying that market entities subject to consumption obligations may fulfil their renewable energy consumption responsibility weights through the purchase of GECs.

In 2021, power trading institutions were launched to carry out green electricity trading. In 2022, it was clarified that renewable energy consumption would not be included in total energy consumption and intensity control targets, further improving the policy framework for green electricity consumption. In 2023, efforts were made to extend GEC coverage to all renewable energy power generation projects, continuously standardizing GEC issuance, improving GEC

trading, and expanding application scenarios. In 2024, the link between GECs and the dual energy consumption control mechanism was strengthened, promoting the inclusion of electricity volumes traded via GECs in energy efficiency evaluation and assessment indicators. In the same year, green electricity trading was formally integrated into the unified medium- and long-term power market at the national level.

In 2025, the Energy Law explicitly stated that the state would establish a green energy consumption promotion mechanism through the implementation of systems such as GECs. In March of the same year, opinions on the high-quality development of the GEC market were issued to accelerate the construction of the GEC market, clarify mandatory consumption requirements, and gradually increase the proportion of green electricity consumption. These policies also promoted the development of green electricity factory consumers and green industrial parks in regions with suitable conditions, improved the voluntary GEC consumption mechanism, encouraged enterprises to over-fulfil green electricity consumption targets, and explored the establishment of tiered and graded green electricity consumption labelling based on GECs. In November of the same year, the Implementation Rules for the Administration of Renewable Energy Green Electricity Certificates (Trial) clarified operational standards for the issuance, transfer, and cancellation of GECs.

Green Electricity Certificates (GECs) are the sole proof of the environmental attributes of renewable energy and the only official certificate for renewable electricity production and consumption in China. Currently, GEC trading in China includes two models: standalone GEC trading and green electricity trading. In standalone GEC trading, certificates are traded separately from electricity ('certificate–electricity separation') and are not constrained by physical electricity transmission channels. In green electricity trading, users purchase both the electricity and the associated certificates by signing a medium- or long-term Power Purchase Agreement (PPA), with the contract specifying the quantity and price of both the physical electricity and the GECs.

Overall, China's GEC-related policies and systems have been progressively refined, forming a relatively mature policy framework that provides enterprise users with a stable, well-developed, and convenient environment for green electricity consumption. This system not only offers clear policy support and implementation pathways for corporate green electricity consumption, but also establishes an orderly and mature market environment, facilitating enterprises' fulfilment of green responsibilities and realization of green development value, and supporting companies in efficiently advancing their green transition and achieving their development objectives.

Overview of Danish and EU green electricity regulation

At the EU level, the Renewable Energy Directive (RED III, Directive (EU) 2023/2413) establishes binding renewable energy targets and provides the legal basis for Guarantees of Origin (GOs) as

the sole instrument to document renewable electricity production and consumption across Member States. GOs function as energy attribute certificates under a harmonised EU-wide framework, enabling transparent disclosure, avoidance of double counting, and market-based renewable electricity claims. Denmark has transposed RED provisions into national law, with the Danish Energy Agency overseeing the legal framework and the national TSO, Energinet, acting as the issuing body responsible for GO issuance, cancellation, and disclosure.

In parallel, corporate Power Purchase Agreements (PPAs) play an increasingly important role in enabling long-term renewable electricity procurement in the EU and Denmark. EU institutions and Nordic governments actively promote PPAs as market-based instruments to support renewable deployment, reduce reliance on public subsidies, and provide long-term price certainty for both producers and consumers. Recent EU initiatives, including the proposed PPA support toolkit (Regulation (EU) 2024/1747), aim to lower contractual, financial, and regulatory barriers to PPA uptake, particularly for corporate buyers and energy-intensive industries.

Emerging policy discussions in the EU further emphasize temporal matching between renewable electricity generation and consumption. RED III explicitly encourages finer time granularity for GOs, and industry initiatives increasingly promote hourly or near-real-time matching of certificates and PPAs to strengthen system integration, grid efficiency, and the credibility of renewable electricity claims. These developments mirror ongoing debates in China around improving the alignment between physical green power supply, certificates, and actual consumption, underscoring shared regulatory challenges and converging policy directions.

Analytical framework for corporate green electricity consumption practices

Companies participating in the green electricity consumption practice study should establish clear climate and energy ambitions, actively engage in collaborative and transparent initiatives such as the Science Based Targets initiative (SBTi), and possess mature experience in navigating regulatory frameworks related to industrial electrification, energy efficiency, and renewable energy integration. Collectively, these companies offer concrete, real-world insights into how policy instruments, market conditions, and corporate strategies interact to drive decarbonization in both Danish and Chinese contexts.

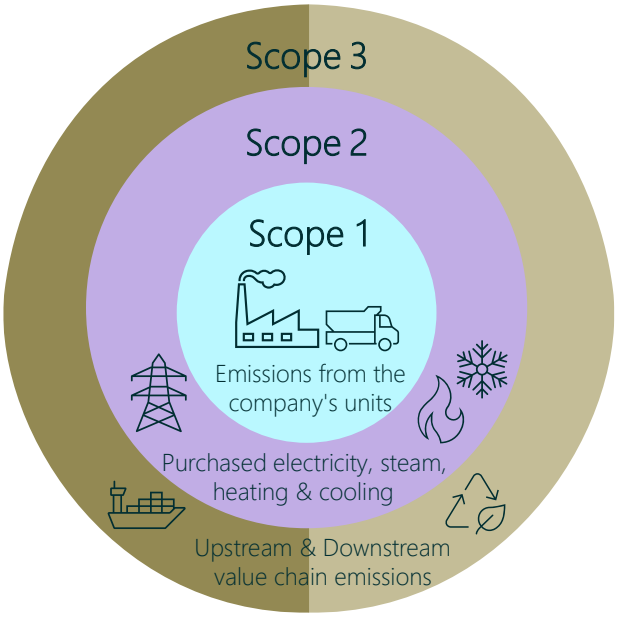

FIGURE 1 Illustration of emission scopes introduced by the Greenhouse Gas protocol for accounting and reporting corporate greenhouse gas emissions (https://ghgprotocol.org/corporate-standard).

The selected companies should have experience in addressing direct emissions from their own operations (Scope 1), indirect emissions from purchased energy (Scope 2) through electrification and renewable energy integration, and the more complex challenge of value-chain emissions (Scope 3). By engaging companies that actively measure, report, and set reduction targets across all three scopes, in alignment with SBTi methodologies, the activity ensures that the emissions footprint of industrial and digital operations are fully reflected. This holistic perspective enables more nuanced insights into how regulatory frameworks, market instruments, and corporate strategies can jointly support deep decarbonization beyond operational boundaries in both Danish and Chinese contexts.

2. Insights & Conclusions

2.1 China's Institutional Safeguards

Since the implementation of China's GEC system in 2017, nearly nine years of continuous development and refinement have resulted in the formation of a comprehensive GEC framework characterized by a legal foundation, policy guidance at its core, institutional mechanisms as support, and standards as safeguards. This framework provides a solid foundation for the scientific management, standardized operation, and high-quality development of GECs.

At the legal level, China's *Energy Law* explicitly establishes a green energy consumption promotion mechanism through the implementation of systems such as GECs. At the policy foundation level, efforts have continued to expand GEC coverage, promote renewable electricity consumption, clarify rules for GEC issuance and trading, and actively foster the GEC market. At

the policy coordination level, minimum renewable energy consumption targets have been defined, alongside the formulation of implementation measures for the renewable electricity consumption responsibility weight mechanism.

Policies have also been issued to align GECs with energy conservation and carbon reduction measures, link GECs with voluntary emission reduction markets, and establish basic rules for medium- and long-term power trading. At the institutional level, measures have been introduced for GEC issuance data management, as well as detailed implementation rules for GEC trading and green electricity trading across various platforms. At the standards level,efforts have been initiated to develop standards related to GECs and green electricity consumption. Overall, China's GEC system has established a multi-layered institutional safeguard structure, providing systematic support for renewable energy consumption incentives and market development.

2.2 Green power procurement practices

Based on the research framework for green electricity consumption practices companies outlined in this report, two Chinese enterprises—Tencent and LONGi Green Energy—and two Danish enterprises—LEGO Group and Danfoss have been selected as case companies.

Among them, the two Chinese companies play leading roles in digital infrastructure and renewable energy manufacturing, respectively. Both have actively engaged in climate target-setting and low-carbon transition practices, providing valuable insights into how large Chinese enterprises translate national climate ambitions into corporate operational strategies and respond to evolving policy frameworks.

The two Danish companies have long been committed to sustainable development, energy efficiency improvements, and the application of renewable energy, and have established mature business operations in the Chinese market. The four companies represent diverse industry sectors and possess extensive experience in green electricity consumption practices, offering important reference value for promoting industry-wide green transition and strengthening China–Denmark bilateral cooperation.

In a later stage, the Sino-Danish Green Power Programme may further expand the scope of participation and consider inviting additional companies, forming a more diverse portfolio of practical case studies.

Tencent

Tencent, operating in the digital infrastructure sector, has established a strategic goal centered on achieving full carbon neutrality across its operations and supply chain by 2030, and using 100% green electricity, to actively respond to global and China's "dual carbon" policies and proactively address climate change risks. The core of its green transition strategy focuses on two main directions: first, improving energy efficiency to reduce electricity consumption per unit of

computing power; and second, expanding green electricity procurement to lower carbon emissions per unit of electricity consumed.

In practice, Tencent has already achieved significant results: in 2024, it consumed more than 1.3 TWh of green electricity, representing a 126% year-on-year increase; its data center power usage effectiveness (PUE) has been continuously optimized to 1.269; and its cumulative installed capacity of self-built renewable energy facilities has reached 63.8 MW. These achievements are mainly supported by key technologies such as Tencent's self-developed T-Block data center architecture and high-efficiency liquid cooling systems, as well as a green electricity procurement strategy that follows the principles of "additionality" and "traceability."

In recent years, the scale of Tencent's green electricity consumption has shown rapid growth, rising sharply from 63 GWh in 2021 to approximately 1,365 GWh in 2024, effectively supporting the low-carbon operation of its data centers and other business activities. Looking ahead, Tencent plans to prioritize achieving 100% green electricity usage in its own campuses, and to apply its self-developed AI energy-efficiency optimization algorithms to upstream suppliers and leased data centers, to address the carbon emission challenges brought by the surge in AI computing demand and to drive low-carbon transformation across the entire value chain, providing a model for the green development of the digital sector.

LONGi

As a leading company in the renewable energy manufacturing sector, LONGi Green Energy has actively responded to global 'dual carbon' goals and ESG policy requirements by setting clear emissions reduction targets: achieving Scope 1 and Scope 2 targets by 2030, and ultimately aiming to achieve net-zero emissions across its entire value chain by 2050.

Facing the challenge of a carbon emissions peak in 2023 caused by a significant increase in business volume, LONGi adopted a systematic emissions reduction approach. On one hand by continuously unlocking energy-saving potential: LONGi carried out hundreds of energy-saving technical upgrades and applied digital technologies such as the industrial internet and AI, achieving a 10.7% year-on-year decrease in overall electricity consumption per unit of output in 2024. On the other hand by expanding green power consumption channels, through on-site solar PV installation, green electricity trading, GEC transactions, etc. LONGi increased the proportion of renewable electricity use to 47.5%.

In 2024, LONGi's green power consumption achieved through the purchase of GECs reached 143.6 GWh, accounting for about 90% of its total green electricity consumption for that year, making it its primary method. At the same time, LONGi has also built distributed solar PV power

generation systems to meet part of its electricity demand, maintaining a green electricity supply scale of around 15–21 GWh annually over the past three years.

LEGO

As a leading global company in the toy industry, the LEGO Group is guided by its long-term vision of 'creating a sustainable future for children' and has established clear medium- and long-term climate targets. Responding proactively to expectations from regulators and the public for companies to take concrete climate action, LEGO has committed to reduce its absolute greenhouse gas emissions by 37% by 2032 compared with a 2019 baseline, and to achieve net-zero emissions by 2050.

LEGO's decarbonization strategy focuses on reducing emissions across its entire value chain. Key measures include improving energy efficiency in its own operations and accelerating the transition of production sites toward renewable energy in order to lower overall emissions. As one of the core pillars of operational decarbonization, the LEGO Group is expanding its use of renewable electricity in ways tailored to local conditions, including "on-site photovoltaic generation + off-site procurement of green electricity, such as through Power Purchase Agreements (PPAs)".

For example, at its factory in Jiaxing, China, LEGO has installed on-site photovoltaic systems and complemented them with green electricity procurement through PPAs, enabling the facility to achieve 100% renewable electricity consumption. At the same time, the factory is gradually phasing out fossil fuels and implementing an energy management system based on ISO 50001.

Currently, China's green electricity market is dominated by annual or shorter-term PPA contracts, with multi-year procurement mechanisms still in the pilot stage. LEGO is actively working to promote more stable long-term green electricity procurement frameworks to support the implementation of its global net-zero targets in China.

Danfoss

As a leading company in the field of energy efficiency control, regarding decarbonization as a key strategic pathway to enhancing its core competitiveness, Danfoss has established ambitious climate targets, committing to reduce its absolute greenhouse gas emissions by at least 90% by 2030 compared with a 2024 baseline, and planning to achieve full decarbonization of its operations in China by 2027. These targets are closely aligned with the goals of the Paris Agreement and have been validated by the Science Based Targets initiative (SBTi).

To achieve these targets, Danfoss has adopted a dual strategy of improving operational efficiency while expanding renewable energy procurement. Energy efficiency lies at the core of Danfoss's energy transition strategy and is regarded as the "first energy." Through the

implementation of energy efficiency retrofitting projects, the company has achieved an average annual efficiency improvement of approximately 5%. Between 2019 and 2025, Danfoss reduced its carbon dioxide emissions by 82% through a combination of energy efficiency improvements and an increased share of renewable electricity.

In terms of green electricity procurement, Danfoss primarily uses Power Purchase Agreements (PPAs) to source renewable electricity for its major production facilities. For locations with smaller electricity demand, the company plans to achieve green electricity coverage through the purchase of Green Electricity Certificates (GECs) starting in 2026. Experience shows that the PPA model effectively enables companies to scale renewable electricity procurement in line with growing electricity demand. The share of electricity procured through PPAs increased from 41% of Danfoss's total electricity consumption in 2024 to 86% in 2025, corresponding to more than 98 GWh of renewable electricity under contract.

2.3 Key Barriers Identified by Companies

Based on feedback from participating companies and the analysis conducted, the main barriers to accelerating the green transition and expanding green electricity consumption can be grouped into several key areas.

Balancing business growth and emission reduction targets. Rapid expansion of business scale, such as increased computing capacity or growth in product shipments, drives up energy consumption and carbon emissions. Given the current technical conditions, conventional energy efficiency and conservation measures alone are often insufficient to fully offset incremental emissions. As a result, short-term misalignments between business expansion and emission reduction objectives may emerge, posing challenges for emissions reduction efforts.

Mismatch between the cost of green electricity consumption and enterprises' ability to bear these costs. In the current market environment, the additional expenses associated with green electricity consumption place a certain burden on some enterprises, particularly small and medium-sized enterprises and energy-intensive industries. At the same time, the environmental value of green electricity is not yet fully reflected in product pricing, market competition, or policy incentives, resulting in a weak alignment between companies' green electricity investments and actual returns, which to some extent undermines their intrinsic motivation to expand green electricity consumption.

Supply chain emissions as a major bottleneck for decarbonization. From the perspective of corporate emissions structures and for some of the enterprises, direct emissions from the enterprises' own operations typically account for a relatively small share of total emissions, with the majority originating upstream in the supply chain, including raw material extraction,

component manufacturing, and logistics. The complexity of supply chains, low transparency of carbon emissions data across different stages, and limited corporate control over upstream suppliers result in systemic challenges, such as unclear responsibility allocation, high coordination costs, and insufficient incentives for emission reduction across the full value chain, becoming a major bottleneck for enterprises in achieving full value chain decarbonization.

2.4 Enablers and Solutions

In response to the challenges faced by enterprises identified above, and taking into account the current state of development of China's green electricity market, this report proposes the following recommendations:

Appropriately manage the cost of green electricity consumption and strengthen positive incentive mechanisms. This includes promoting the establishment of market-based pricing mechanisms that reflect the environmental value of green electricity, balancing the cost of green electricity development with enterprises' ability to bear such costs, and reasonably controlling price premiums in green electricity and GEC trading. At the same time, the policy effectiveness of green electricity consumption should be enhanced across areas such as dual energy consumption control, carbon accounting, green factory and park evaluation, and brand certification. By linking companies' green electricity consumption performance with project approvals, resource allocation, and financing support, enterprises' green investments can be translated into competitive advantages and policy benefits, thereby stimulating their intrinsic motivation.

Driving energy efficiency and energy substitution in a coordinated manner. Enhancing energy efficiency can develop enterprises' core competitiveness. By continuously unlocking energy-saving potential at the equipment, process, and system design levels, enterprises can reduce energy consumption per unit of output, creating carbon headroom for business growth, alleviating the tension between business growth and emissions reduction targets. In sectors where electrification is not feasible, enterprises could actively explore zero-carbon alternatives such as green hydrogen and biomass fuels to drive fundamental transformation of key energy-use structures, expanding decarbonization pathways.

Establish a collaborative supply chain decarbonization system to drive green transformation across the entire value chain. Leading and core enterprises should be supported in developing supplier carbon management mechanisms, incorporating green electricity consumption levels and carbon emissions into supplier access and evaluation systems, thereby encouraging upstream and downstream enterprises to advance green electricity consumption in a coordinated manner. A supply chain carbon data-sharing platform should be established to standardize accounting methodologies and improve transparency of suppliers' emissions data. Through technical support, green finance, and other measures, small and medium-sized suppliers can be

encouraged to increase their share of green electricity consumption, fostering a coordinated emissions reduction framework across the supply chain.

2.5 Cross-Cutting Insights and Overall Conclusions

Carbon neutrality has evolved from an optional environmental initiative into a mandatory strategic inflection point that determines enterprises' long-term survival and development.

Corporate development mode should shift from scale-driven growth to carbon-efficiency-driven growth. Sustainable enterprise growth in the future can no longer rely on traditional high-emission models, but should instead focus on maximizing the economic value generated per unit of carbon emissions. This requires fully integrating carbon management into corporate strategy and innovation systems, enabling low-carbon, high-quality development.

Corporate perception of emissions reduction should shift from cost burden to competitive advantage. Systematic decarbonization capabilities are becoming a new source of competitive advantage. Enterprises that can effectively manage emissions across their own operations and supply chains and actively pursue the green transition will gain structural advantages in regulatory compliance, customer preference, and international markets, achieving a win-win of environmental and economic benefits.

Emissions reduction pathways should shift from individual emission reduction to supply chain ecosystem-wide value creation. Achieving carbon neutrality cannot rely on isolated corporate efforts and requires coordinated industry-wide efforts. Industry leaders should proactively assume "chain leader" responsibilities, building low-carbon industrial ecosystems characterized by shared technologies, interoperable standards, and aligned incentives, thereby driving green transformation across entire industrial chains and supply chains, fostering a green development landscape with broad participation across society.

The orientation of green electricity consumption should shift from compliance-driven targets to incentivizing additionality. In the context of the continued development of China's renewable energy market, if GECs are used solely as a market-based tool for meeting compliance requirements, their ability to drive the expansion of new renewable energy capacity will be limited. Therefore, it is recommended to further improve the supporting mechanisms for GECs, strengthen the link between certificate demand and actual climate benefits, and encourage enterprises to procure green electricity generated from newly developed renewable energy projects. This would help guide green electricity consumption from a 'compliance-driven' approach toward 'addition-driven' action, thereby supporting the high-quality development of renewable energy in China.

Annexes

Annex 1: Individual company case stories

Green Case Story
Tencent Towards 100% Green Energy

Company Introduction

Founded in 1998 and headquartered in Shenzhen, China, Tencent is a world-leading internet technology company.

Tencent operates one of the world's largest gaming businesses and provides a broad range of internet-related products and services, including WeChat, cloud computing, financial technology, and other digital platforms serving global users.

Main Targets & Drivers

- Carbon neutrality in its operations and supply chain by 2030
- Using 100% green power by 2030

These commitments are driven by:

- Addressing climate change risks
- Tencent is responding to global climate action and China's carbon peaking and carbon neutrality goals

Key Results

↓ 12% — In 2024, Tencent's total greenhouse gas emissions per unit of revenue decreased 12.4% compared to the base year 2021

↑126% — In 2024, Tencent consumed more than 1300 GWh of renewable electricity, increasing by 125.8% compared to 2023

↑ 22% — By 2024, the total installed on-site renewable electricity capacity reached 63.8 MW, an increase of 22.2% from 2023

Challenges

Tencent has encountered the following challenges:

- Under the AI boom, how to achieve carbon neutrality while electricity consumption increases?
- How to compel upstream suppliers to jointly achieve carbon neutrality?

Solutions

Tencent has addressed these challenges by:

- 1) reducing power consumption per unit of computing power, and 2) reducing carbon emissions per unit of electricity used, to minimize the emissions from AI growth.
- Leveraging the accumulated energy reduction techniques and green electricity procurement experience, Tencent empowers upstream suppliers to improve efficiency and reduce carbon emissions.

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Green Case Story
Tencent Towards 100% Green Energy

Site-specific case

- In data centers across China, Tencent has reduced the Power Usage Effectiveness (PUE) from 1.289 in 2022 to 1.269 in 2024, improving the energy efficiency of computing power.
- To reduce emissions of the electricity used, Tencent procured more than 1300 GWh of green electricity in 2024, growing 306% from 2022.
- Tencent also utilise on-site space to build renewable energy facilities, which have reached 63.8 MW by 2024, with annual electricity generation of more than 52 GWh.

Technologies Adopted

- Tencent independently developed the T-Block IDC structure and several key hardware and software equipment to achieve energy optimization. For example, the self-developed Xunqi indirect evaporative air conditioner improved efficiency by 16% compared to previously purchased ACs.
- Since 2021, Tencent has adhered to "additionality, traceability, and proximity" in procuring high-quality green electricity.
- Tencent's "wind, solar, and storage + load" microgrid project achieved multi-energy synergy and optimization through an intelligent management platform, innovatively reducing carbon emissions without increasing costs.

Future Outlook

Tencent has launched a self-developed high-efficiency liquid cooling system in response to the AI era, aiming to further optimize PUE and materialize sustainable computing.

Tencent will prioritize achieving 100% green electricity in its own data centers and leverage its years of experience in green electricity procurement to empower leased data centers, gradually achieving 100% RE across all data centers.

Lessons Learned & Replicability

The team abstracts its experience in energy optimization into AI algorithms, enabling intelligent adjustment of parameters such as supply air temperature and fan speed. This algorithm is mainly applied to leased data centers with aged cooling system, supporting upstream suppliers to improve their data centre efficiency.

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Green Case Story
The LEGO Group on the path towards net-zero emissions

Company Introduction

The LEGO Group's mission is to inspire and develop the builders of tomorrow. The LEGO Group was founded in Billund, Denmark in 1932 by Ole Kirk Kristiansen, its name derived from the two Danish words 'LEg GOdt', which means 'play well'. Today, the LEGO Group remains a family-owned company headquartered in Billund. Its products are now sold in more than 120 countries worldwide.

Main Targets & Drivers

- Reduce absolute GHG emissions 37% by 2032 compared to 2019
- Reach net zero emissions by 2050.
- The LEGO Group aims to play a positive part in-helping to build a more sustainable future, and make a positive impact on society and the planet, which children will inherit.
- Both the general public and regulators expect companies to take action minimise environmental impact.

Key Results

9.15% Natural gas use across all LEGO® sites was reduced from 20.88% of total energy consumption in 2021 to 9.15% in 2025.

5.8% Reduced scope 2 emissions by direct solar power. Solar power accounts for 5.8% of our total energy consumption in 2025. We are exploring power purchase agreements (PPAs) for each factory individually, and already achieved that in some places, including Jiaxing. For the energy needs that cannot currently be met by PPAs we purchase high quality Renewable Energy Certificates (RECs) to bringing our scope 2 emissions down.

64% 64% of the materials used in our products, excluding colourants, are sourced from renewable and recycled inputs, up from 50% in 2024.

Challenges

Current practice in China allows short-term PPA contracting, while there is a need for long-term to be accommodated.

Material innovation takes time, there are many sustainable material options, while only a few meet our high quality and safety standards.

The vast majority of our absolute carbon emissions come from our value chain.

Solutions

To address these challenges, the LEGO Group is:

Engaging proactively with industry associations and regulatory authorities.

Continuing our journey to explore new materials to make our products from more renewable and recycled materials.

Working with suppliers to reduce GHG emissions across our supply chain. We have deployed intensity-based 2026 and 2028 reduction targets for 52 of our highest impact suppliers, representing almost 50% of Scope 3 emissions.

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Green Case Story
The LEGO Group on the path towards net-zero emissions

Site-specific case: LEGO Jiaxing factory

- Advanced energy efficiency features (thermal insulation, natural lighting, intelligent control of AHU, and lighting) have been incorporated early into the design of the Jiaxing factory well above industry average, leading to LEED certification upon construction completion.
- Jiaxing was the first factory in the LEGO group to adopt the ISO50001 Energy Management System in 2019. Through systematic optimizations, the unit energy consumption has been reduced dramatically by ~68% by the end of 2025.
- LEGO Jiaxing spearheaded the recovery of low-quality excess heat in the chiller systems, which enabled the site to reduce natural gas consumption by 40% by 2025.
- Jiaxing factory maximized the usage of all solar capturing areas through the installation of 20,143 pieces of PV panels, which provided 9.45MW of green power capacity, offsetting ~17% of total annual consumption of the factory. The remaining need for renewable energy capacity will be covered by the site's PPA contract with its energy provider.

Technologies Adopted

- Jiaxing factory has utilized high efficiency chiller with a heat recovery module to salvage low-quality excess heat to reduce consumption of natural gas in its hot water boiler system.
- Since 2021, Jiaxing factory has embarked on a program to increase its electric power efficiency (+40%) in the moulding area through the introduction of high output moulds and the electrification of its moulding machines. As of 2025, 40% of moulded elements have been produced under the new high energy efficiency platform.
- Jiaxing factory has introduced the usage of chilled water as a medium of energy storage, as against conventional battery storage solutions. Besides providing a safer and more environmentally friendly setup, it also enables the site to flexibly reduce its power consumption (chiller) from the grid during its peak hours.

Future Outlook

- **Scaling more sustainable materials**: Continue exploring scalable, safe, and more sustainable alternatives.
- **Supplier decarbonization**: Active reduction, supported by digital tools, training, and incentives to reduce Scope 3 emissions.
- **Carbon removal investments**: The LEGO Group is continuing to develop its understanding of different approaches to carbon removal, taking the total commitment in carbon removal to DKK 54 million.
- **Localized energy transitions**: Tailor strategies to each market—expand renewable energy capacity and energy efficiency across locations.

Lessons Learned & Replicability

- Aim high, take concrete steps, and reduce emissions as early as possible.
- Early and proactive engagement with regulatory authorities.
- Tailored, context-specific solutions across global sites.
- Strategic collaboration with suppliers and partners.
- Robust internal accountability and governance mechanisms.

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Green Case Story
LONGi "Lighthouse + Zero Carbon" Factory

Company Introduction

Founded in 2000, LONGi Green Energy Technology Co., Ltd. (LONGi) is committed to being the most valuable solar technology company in the world. LONGi is developing solutions for large-scale power plants, for different industries and households. Eventually LONGi will also supply "Green Power + Green Hydrogen" solutions for global zero-carbon development.

Main Targets & Drivers

- Reduce Scope 1 and Scope 2 greenhouse gas emissions by 60% by 2030 compared with 2020
- Reduce the emissions intensity under Scope 3 by 52% by 2030 compared with 2020
- Net-zero emissions across the entire value chain by 2050

These commitments are driven by:

- Dual Carbon goals, ESG policies, and requirements from local regulators
- Regulatory frameworks and policies driving the energy transition

Key Results

↑ 48%

In 2024, the company's annual green electricity usage ratio steadily increased to 47.5% compared to 2023, equivalent to reducing CO_2 emissions by approximately 2.5467 million tons. The Scope 1 & 2 emissions decreased by 37% compared to that in 2023, while Scope 3 emissions reduced by 26% over the same period.

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A total of 26 energy-saving projects were implemented in 2024, resulting in annual energy savings of approximately 13 GWh, equivalent to a reduction of 7,600 tons of CO_2 emissions.

↓ 20%

After the implementation of the "Lighthouse Factory" project, the overall energy consumption per unit at production bases decreased by 20%.

Challenges

Some challenges LONGi face include:

- Majority of emissions are in Scope 3, from upstream and downstream activities.
- Sharp increase in operational emissions in 2023 compared to the previous year, driven by significant growth in wafer and module shipments, up 47.4% and 44.4%, respectively.
- Decline in the share of electricity sourced from renewables.

Solutions

- LONGi is driving collaborative emission reduction among core raw material and logistics suppliers through low-carbon raw material procurement, advocating the use of renewable electricity, and promoting raw material carbon footprint certification.
- To ensure the effective implementation of the transition pathway amid rapid growth, LONGi has built a climate governance architecture centered on the Board of Directors, supported by a Strategy and Sustainability Committee providing an overarching governance framework for emission reductions.
- LONGi collaborates with stakeholders including international organizations, industry alliances, and value chain enterprises to jointly accelerate the global clean energy transition.

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Green Case Story
LONGi "Lighthouse + Zero Carbon" Factory

Site-specific case: Jiaxing Lighthouse Factory

LONGi's Jiaxing facility, the world's first "Lighthouse Factory" in the PV sector, serves as a flagship example of digitalized, low-carbon manufacturing. The site has implemented advanced technologies such as industrial Internet, big data, artificial intelligence, and digital twins on a large scale with more than 30 digital use cases spanning flexible automation, AI-powered full-process inspection and traceability, intelligent production and delivery planning and workforce management. In 2024, the Jiaxing site became LONGi's first zero-carbon factory, adhering to ISO 14068 standards, and is currently the first "Lighthouse + Zero Carbon" factory in the photovoltaic industry.

LONGi has formulated a 2024–2028 supplier ESG capacity building plan, aiming at increasing the share of critical direct (Tier 1) suppliers participating in capacity-building programs from 73% in 2024 to 95% by 2028. Through the "LONGi e-Learning Supplier Platform," LONGi provides systematic sustainability training and technical support to strengthen suppliers' ESG management capabilities.

Technologies Adopted

- Since 2020, LONGi has actively implemented energy-saving and emission-reduction measures across the entire manufacturing process, namely, ingot, wafer, cell, and module manufacturing, to enhance energy efficiency.
- LONGi establishes annual electricity intensity reduction targets for each production unit. With ongoing energy management efforts and energy-saving technological improvements, all units have demonstrated a sustained decline in electricity intensity. In 2024, LONGi achieved a 10.7% reduction in electricity consumption per unit of production compared with 2023, exceeding the annual target of 9.14%.
- In 2024, LONGi implemented 477 energy-saving technological improvement projects, resulting in estimated annual savings of 426 GWh, equivalent to nearly 250,000 tCO_2e emissions avoided.
- In 2024, LONGi utilised 4,746 GWh of renewable electricity through on-site solar installations, green power trading, and green certificate trading. This represents a 53.3% increase in renewable electricity use compared to 2021. Currently, over 95% of LONGi's renewable electricity is sourced through market-based mechanisms, namely green power trading and green certificate trading.

Future Outlook

Next steps:

- Establish a climate-related financial planning framework
- Continue to increase investment in emissions reduction and innovation
- Explore the introduction of an internal carbon pricing mechanism

Lessons Learned & Replicability

- Awareness enhancement and capacity building to ensure the effective implementation of the company's climate transition plan. LONGi deeply integrates climate action into its corporate culture, systematically enhancing the awareness and capabilities of all employees.
- LONGi actively seizes the opportunities of the low-carbon transition, continuously increasing R&D and capital investment.

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Green Case Story
Danfoss on the path towards net-zero emissions

Company Introduction

Danfoss is a global leader in energy efficiency, electrification, digitalization, and intelligent manufacturing, cleantech technology dedicated to promoting low carbon and green development around the world. Founded in 1933 in Nordborg, Denmark, Danfoss has grown into a multinational company with around 40,000 employees and operations in over 100 countries.

Main Targets & Drivers

• Reduce absolute GHG emissions by at least 90% by 2030 from a 2024 base year

• Fully decarbonize operations in China by 2027

These commitments are driven by:

• Alignment with the Paris Agreement and verified science-based targets

• Decarbonization is a competitive strategy that also helps customers transition to a low-carbon economy, supporting market relevance and growth

Key Results

↓ 82% — Reduction in CO_2 emissions by Danfoss China from 2019 to 2025 through a series of energy efficiency improvements and increased share of renewables

85% — Green electricity coverage across 12 sites in China fuels by implementing long-term Green Electricity Purchase Agreements (PPAs) and covering 85% of gas demand by Green Natural Gas Purchase Agreements (GPAs)

↑ 5% — Year on year energy efficiency improvement of 5% through energy efficiency retrofitting

Challenges

Some challenges that Danfoss face include:

- Most emissions are outside of Danfoss operations, as downstream emissions account for around 96% of the total carbon footprint.
- Silo-operation of energy systems results in inefficiencies and heat losses.
- Relying on scaling up renewables is not sufficient unless demand growth is also addressed.

Solutions

Danfoss is addressing these challenges for instance by:

- Focusing on energy-efficient products and solutions enabling electrification as well as prolonging service time and end-of-life initiatives.
- Danfoss focuses on sector integration and district energy systems
- Danfoss puts energy efficiency on the demand side at the centre of energy transition efforts, framed as the "first fuel".

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Green Case Story
Danfoss on the path towards net-zero emissions

Site-specific case

Danfoss Tianjin consistently integrates intelligent transformation into its green operations, leveraging advanced technologies such as Turbocor centralized cooling, intelligent heating, heat pumps, heat recovery, and comprehensive energy utilization to significantly enhance the energy efficiency of its industrial park.

Since 2015, Danfoss Tianjin's output has increased by 46%, while overall energy consumption has decreased by 5%, leading to a 71% improvement in energy efficiency. Procuring green electricity, primarily through PPAs, Danfoss Tianjin achieves an annual emission reduction of over 25,200 tons, contributing 28.7% to Danfoss China's emission reduction target and 7% to Danfoss' global emission reduction goal.

Technologies Adopted

- Process Innovation: Applied technologies like heat pumps for energy self-circulation, replacing traditional heating sources.
- Electrical Transformation: Increased the proportion of electricity in terminal energy consumption, including district heating via heap pump solutions, kitchen electrification, replacing traditional fuel cars with e-vehicles in company car and shuttle bus.
- Intelligent Management: Implemented energy management systems (BMS) for lighting, HVAC, and other areas with zone control, scheduling, and logic control.

Future Outlook

- Danfoss continues to execute its 2030 roadmaps with continued investment in operational abatement.
- Danfoss will keep scaling energy-efficiency and decarbonization projects in China, using local sites as an important platform for progress toward its 2030 climate ambitions.
- Danfoss anticipates regulatory developments affecting reporting and classification, and is monitoring changes, such as evolving EU Taxonomy rules, which will influence future sustainability strategy and investments.

Lessons Learned & Replicability

- Collaboration across the supply chain is critical. Danfoss' supplier engagement program ("Green Ask") enables better data and identifying decarbonization initiatives.
- Structure can turn ambition into action. A clear project pipeline based on the Danfoss Reduce, Re-use, and Re-source strategy is used to identify and implement improvement initiatives.
- Public-private partnerships can accelerate the energy transition by aligning policy ambition with industrial implementation and reducing regulatory fragmentation.
- ESG is a driver of business value. At Danfoss, ESG is embedded in the sales approach as products that improve machine efficiency directly support customers' sustainability goals.

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Annex 2: Key Policy Documents on China's Green Electricity Certificates

No.	Document Title	Key Content
1	**Notice of the National Development and Reform Commission, Ministry of Finance, and National Energy Administration on Piloting the Issuance of Renewable Energy Green Electricity Certificates and a Voluntary Subscription and Trading System** (Fa Gai Neng Yuan [2017] No. 132)	Pilots the nationwide issuance of Green Electricity Certificates (GECs) and voluntary subscription. GECs are issued for renewable electricity generated by onshore wind power and photovoltaic power projects (excluding distributed PV).
2	**Notice of the National Development and Reform Commission and National Energy Administration on Actively Promoting Subsidy-Free, Grid-Parity Wind and Solar Power Projects** (Fa Gai Neng Yuan [2019] No. 19)	Expands the scope of GEC issuance to subsidy-free, grid-parity wind and solar projects and low-price grid-connected projects, allowing them to obtain tradable GECs and encouraging project owners to earn reasonable revenue through certificate sales.
3	**Notice of the National Development and Reform Commission and National Energy Administration on Establishing and Improving the Renewable Energy Electricity Consumption Guarantee Mechanism** (Fa Gai Neng Yuan [2019] No. 807)	Establishes a long-term development mechanism guided by renewable electricity consumption, sets renewable electricity consumption responsibility weights within total electricity consumption, and allows obligated entities to fulfill their consumption targets through voluntary purchase of GECs.
4	**Official Reply of the National Development and Reform Commission on the Pilot Scheme for Green Electricity Trading** (Fa Gai Ti Gai [2021] No. 1260)	Approves State Grid and China Southern Power Grid to carry out green electricity trading pilots. Clarifies that, in the initial phase, green electricity products include on-grid electricity from wind and solar power projects that meet national policy requirements, with gradual expansion to eligible hydropower projects as market conditions develop.

No.	Document Title	Key Content
5	**Notice of the National Development and Reform Commission, National Bureau of Statistics, and National Energy Administration on Further Improving the Treatment of Newly Added Renewable Energy Consumption Outside Total Energy Consumption Control** (Fa Gai Yun Xing [2022] No. 1258)	Clarifies that GECs serve as proof of renewable electricity consumption. Renewable energy consumption at the provincial level is calculated based on the current-year GECs held by electricity users within the province, while enterprise-level renewable energy consumption is calculated based on the GECs held by the enterprise in the relevant year.
6	**Notice of the National Development and Reform Commission, Ministry of Finance, and National Energy Administration on Advancing Full Coverage of Green Electricity Certificates and Promoting Renewable Electricity Consumption** (Fa Gai Neng Yuan [2023] No. 1044)	Enhances the authority, uniqueness, and universality of GECs. Clarifies that the National Energy Administration is responsible for GEC management; establishes GECs as the sole proof of the environmental attributes of renewable electricity in China; confirms their foundational role in supporting green electricity trading, certifying green electricity consumption, and accounting for renewable electricity consumption; and promotes alignment with the domestic carbon market and international green consumption and carbon reduction systems.
7	**Notice of the National Development and Reform Commission, National Bureau of Statistics, and National Energy Administration on Strengthening the Linkage between Green Electricity Certificates and Energy Conservation and Carbon Reduction Policies to Promote Non-Fossil Energy Consumption** (Fa Gai Huan Zi [2024] No. 113)	Strengthens coordination between GEC trading and policies such as dual energy consumption control and carbon emissions management, stimulates GEC demand, consolidates the foundation for certificate issuance and trading, expands application scenarios, and promotes domestic and international mutual recognition of GECs.
8	**Notice of the National Development and Reform Commission and the National Energy Administration on**	The document clarifies the trading methods, pricing mechanisms, contract execution, and settlement mechanisms for green electricity trading, establishes

No.	Document Title	Key Content
	Issuing the Basic Rules for Medium- and Long-Term Electricity Trading — Special Chapter on Green Electricity Trading (Fa Gai Neng Yuan [2024] No. 1123)	unified national-level rules for green electricity trading, and ensures full alignment and organic integration with systems such as renewable electricity consumption obligation quotas and GECs.
9	**Opinions of Five Ministries Including the National Development and Reform Commission and the National Energy Administration on Promoting the High-Quality Development of the Renewable Energy Green Electricity Certificate Market** (Fa Gai Neng Yuan [2025] No. 262)	By 2027, establishes a largely complete GEC trading system, improves a green electricity consumption mechanism combining mandatory and voluntary consumption, and basically establishes systems for accounting, certification, and labeling of green electricity consumption, enabling smoother coordination with other mechanisms, accelerating the release of market potential, achieving steady progress in the international application of GECs, and realizing seamless nationwide circulation of GECs. By 2030, further improves the GEC market system, significantly increases autonomous green electricity consumption across society, ensures efficient and orderly market operation, enables effective international application of GECs, and ensures that the environmental value of green electricity is reasonably reflected.
10	**Implementation Rules for the Administration of Renewable Energy Green Electricity Certificates (Trial)** issued by the National Energy Administration (Guo Neng Fa Zi Zhi Gui [2025] No. 107)	Further refines procedures for GEC issuance, trading, application, and cancellation, establishing a comprehensive, clearly defined, standardized, and transparent full life-cycle management system for GECs.