

**Hisense | HITACHI**

# White Paper: Hisensehitachi Carbon Neutrality



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## Introduction

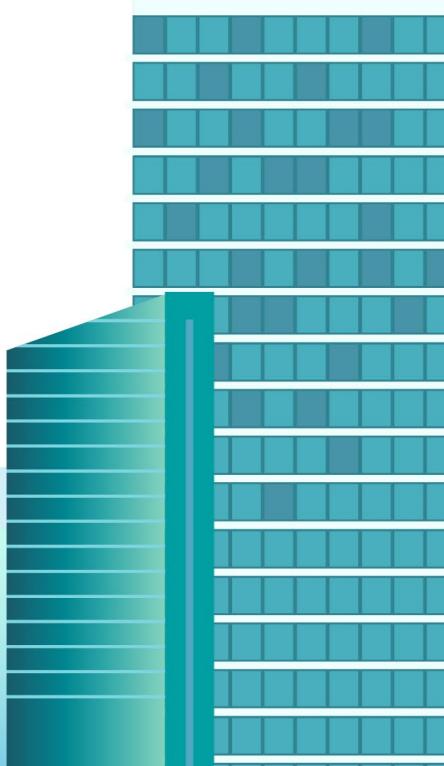
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## Leadership Message



In the face of severe global climate change challenges, Hisensehitachi, as a pioneer in the HVAC industry, upholds its mission of green development. Driven by technological innovation, the Company actively promotes energy conservation and emissions reduction, committing to achieve carbon neutrality in its operations by 2038.



In 2023, global temperatures reached their highest levels since 1850, with extreme climate events occurring frequently. These events not only broke temperature records but also intensified the demand for summer cooling and winter heating. By 2050, an estimated 2.6 billion people will live in regions requiring both heating and cooling, placing unprecedented pressure on global energy systems and the environment. Currently, building heating accounts for 10% of global carbon dioxide emissions, and the United Nations Environment Programme (UNEP) predicts that global cooling equipment capacity will triple by 2050, driving a surge in power consumption and refrigerant demand, thereby accelerating greenhouse gas emissions growth.

The HVAC industry, as a key sector in energy consumption and greenhouse gas emissions, plays a crucial role in achieving global carbon neutrality goals. Facing these challenges, Hisensehitachi has demonstrated responsibility and leadership by transforming pressure into momentum for progress, led by technological innovation to promote high-quality development comprehensively. We recognize that while HVAC equipment usage presents challenges to climate change, it also offers valuable opportunities to drive industry green transformation. Therefore, Hisensehitachi emphasizes green management

throughout product lifecycle, considering energy conservation and emission reduction in all aspects from product design, manufacturing, and use to recycling, ensuring products achieve energy efficiency and environmental protection goals.

In product design, Hisensehitachi closely aligns with market demands and brand positioning, fully leveraging technological innovation advantages to continuously launch energy-efficient and environmentally friendly products. The successful development of the photovoltaic-storage direct-flexible variable frequency central air conditioning system marks our significant breakthrough in distributed energy system applications, effectively solving traditional air conditioning's high energy consumption while achieving product green and smart upgrades. Meanwhile, we follow heat pump technology development trends, creating a series of efficient, green heat pump products, such as high-efficiency magnetic levitation products, air-cooled modules replacing gas supplementary heating systems, ultra-high temperature screw heat pump units, and positive pressure liquid floating oil-free variable frequency centrifugal machines. These innovations provide more environmentally friendly and economical solutions for heating systems, helping global transition to safe, sustainable heating methods.

In manufacturing, Hisensehitachi adheres to green development principles, achieving energy conservation and carbon reduction in production through equipment improvement, technological innovation, process optimization, energy structure optimization, and digital-intelligent integration. We are honored to be selected as a national-level "Green Factory" and Ministry of Industry and Information Technology's intelligent manufacturing demonstration factory. These honors not only affirm our past efforts but also motivate our future development. In product recycling, we actively practice extended producer

responsibility, working with downstream partners to build a green product recycling closed loop, promoting positive industry green development cycles.

Hisensehitachi consistently upholds long-term principles, viewing green low-carbon development as core corporate strategy. Based on the ESG (Environmental, Social, Governance) management system, we have built an "energy-carbon" management system ensuring orderly advancement of company low-carbon initiatives. Combining company business development strategy and industry low-carbon development status, we have set scientific carbon neutrality goals, committing to achieve operational carbon neutrality by 2038. To this end, Hisensehitachi has established a carbon neutrality action pathway focused on four key areas: "Green Management Operations," "Green Manufacturing," "Green Supply Chain," and "Green Products and Solutions," ensuring successful achievement of carbon neutrality goals.

"Achievement comes from determination, and success from diligence." Hisensehitachi deeply understands that achieving carbon neutrality goals is a long and challenging journey. Looking ahead, we will seize opportunities in HVAC industry transformation, continuously exploring green innovation boundaries, with technology as wings driving dual leaps in product energy efficiency and environmental performance. We are committed to becoming a leader in green development, setting industry benchmarks through practical actions, and working with all sectors of society to contribute to achieving carbon neutrality goals.



Hu Jianyong

President of Hisensehitachi



# Company Overview

## Company Profile

Qingdao Hisensehitachi Air-conditioning Systems Co., Ltd. (referred to as 'Hisensehitachi', or 'the Company' in this report), established on January 8, 2003, is headquartered in Qingdao, China. As a renowned central air-conditioning manufacturer both domestically and internationally, Hisensehitachi integrates commercial and residential central air conditioning technology research and development, product manufacturing, market sales, and customer service, demonstrating comprehensive strength and market potential in the central air conditioning field. The company's core business covers multiple areas including VRF systems, chillers, heat pump and fresh air systems, providing comprehensive solutions for customers.

Hisensehitachi upholds the values of "Keeping to Pioneer Spirit, Sticking to Market-orientation, Staying Committed to Integrity," actively implementing excellence in management, innovative R&D, intelligent manufacturing, professional marketing, customer orientation, efficient supply chain, and meticulous service operating systems. The Company pursues technological innovation and product upgrades to meet market and customer needs, striving to become a leader in the central air conditioning industry and drive continuous industry progress.

## Company Honors

### Hisensehitachi Green Low-carbon Enterprise-level Honors and Achievements



2024

Hisensehitachi Huangdao Factory was approved as a part of the Global Lighthouse Network

Hisensehitachi won the "2023 Dual Carbon Action Contribution Award" at the 13th Public Welfare Festival

Hisensehitachi was awarded Provincial Green Supply Chain Enterprise title



2023

Hisense Central Air Conditioning was selected for Global Web "2023 Outstanding ESG Development Cases"



2022

Hisensehitachi received China Refrigeration and Air-Conditioning Industry Low-carbon Certification Certificate

Hisensehitachi was selected as National Green Factory



### Hisensehitachi Green Products and Technology Enterprise-level Honors and Achievements



2023

Received "China Refrigeration and Air Conditioning Industry Product Carbon Footprint Certificate"



2022

"Multi-functional Multi-connected Unit with Wide Temperature Range Based on Water-fluorine Linkage Control and Sensible Heat Defrosting Technology" won Qingdao City Science and Technology Award Second Prize



"Temperature and Humidity Separate Control Heat Recovery Smart Central Air Conditioning Key Technology and Industrialization" won Shandong Province Science and Technology Award Second Prize



"Key Technology Research and Application of Water-fluorine Full VRF High-efficiency Central Air Conditioning Smart Energy Management System" won China Light Industry Federation Science and Technology Award Second Prize



2021

Won ECCJ Japan Energy Conservation Award's highest level - Minister of Economy, Trade and Industry Award

Multiple technical achievements and awards for innovative air conditioning and heat pump technologies

Hisensehitachi's "Key Technology Research and Application of Smart Energy-saving Low-carbon IoT VRF Air Conditioning Units" won the Second Prize of China Light Industry Federation Science and Technology Award

Hisensehitachi's "Research and Industrialization of Key Technologies for Wide-temperature High-efficiency Multi-connected Central Air Conditioning" won the Second Prize of Qingdao Science and Technology Award

# Introduction

## Planning Green Blueprint, Building Low-carbon Foundation

Green development is humanity's eternal theme. Under this theme, building energy consumption is "moving towards zero,"<sup>1</sup> while leading HVAC and central air conditioning, which accounts for 60%<sup>2</sup> of public building energy consumption, towards green low-carbon transformation<sup>3</sup>. Hisensehitachi has been deeply engaged in the HVAC industry for over 20 years, continuously practicing the development philosophy of "sharing opportunities, building development, and creating the future together." Driven by green and low-carbon principles, we continuously innovate technology and product services, advancing towards a low-carbon, beautiful, and sustainable future.

Hisensehitachi actively responds to domestic and international low-carbon emission policies. Combining enterprise characteristics, future development planning, and industry best practices, we have analyzed and formulated a phased, multi-pathway carbon neutrality action strategy. Hisensehitachi will consistently adhere to green low-carbon high-quality development principles, guided by the "Hisensehitachi Carbon Neutrality Action Strategy." We continue to advance implementation across four key work areas: "management operations," "production manufacturing," "supply chain," and "products," striving to achieve enterprise operational carbon neutrality by 2038, working to inject "Hisensehitachi" green vitality into new era quality living.

**Hisensehitachi Carbon Neutrality Goals**

07

**Hisensehitachi Carbon Neutrality Action Pathway**

09



<sup>1</sup>Notice from the General Office of the State Council on Forwarding the 'Implementation Plan for Accelerating Energy Conservation and Carbon Reduction in the Building Sector' Issued by the National Development and Reform Commission and the Ministry of Housing and Urban-Rural Development

<sup>2</sup>China Electronics News How Chinese Enterprises Achieve Carbon Neutrality in a Sector that Accounts for 60% of Public Building Energy Consumption

<sup>3</sup>Opinions on Comprehensively and Accurately Implementing the New Development Philosophy to Achieve Carbon Peak and Carbon Neutrality Goals - issued by the Central Committee of the Communist Party of China and the State Council

# Hisensehitachi Carbon Neutrality Goals

## Carbon Emissions Status

To clarify enterprise carbon emission structure and formulate scientific and reasonable emission reduction planning, Hisensehitachi strictly follows authoritative domestic and international greenhouse gas verification standards<sup>4</sup>. We conducted comprehensive accounting of the company's own operations and value chain carbon emissions for 2023<sup>5</sup>, which has been certified by third-party verification.



<sup>4</sup>This carbon inventory is mainly based on The Greenhouse Gas Protocol jointly published by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), including GHG Protocol: Corporate Accounting and Reporting Standard and GHG Protocol Corporate Value Chain Accounting and Reporting Standard, as well as ISO 14064-1: 2018 Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals

<sup>5</sup>The timeframe for this carbon inventory is January 1, 2023 to December 31, 2023

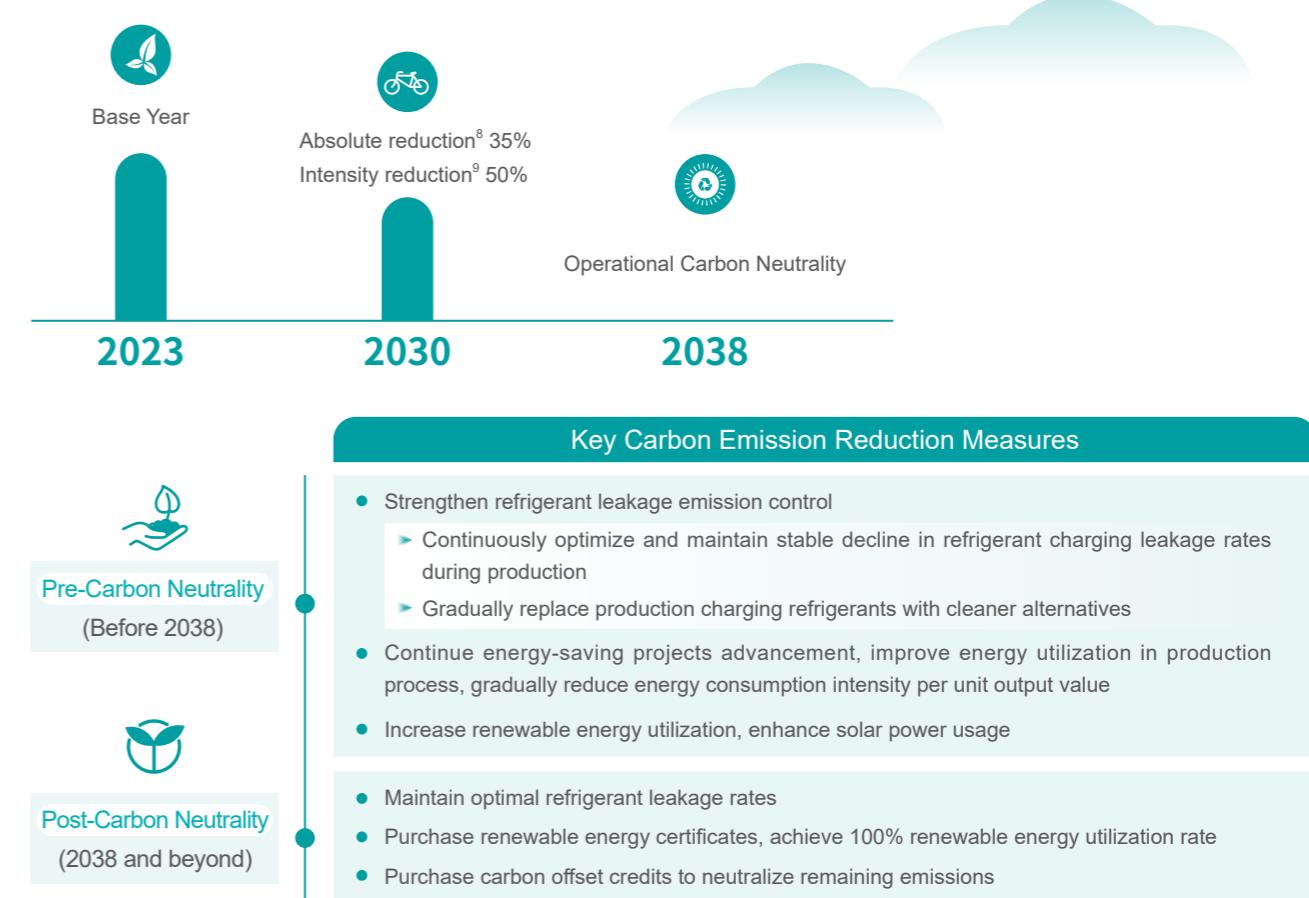
<sup>6</sup>Scope 1: Direct GHG emissions, including stationary combustion, mobile combustion emissions, process emissions and fugitive emissions

<sup>7</sup>Scope 2: Indirect GHG emissions, including emissions from purchased electricity and purchased steam

## Carbon Emissions Targets

Hisensehitachi actively explores paths and methods to organically integrate green low-carbon strategy with enterprise "new quality productivity." With this as our guideline, we plan our approach. Hisensehitachi commits to achieving operational carbon neutrality by 2038, using 2023 as the base year, and sets 2030 as an interim reduction target year. We strive to achieve absolute reduction of 35% and intensity reduction of 50% in Scope 1 and Scope 2 emissions through scientific management and technological innovation, laying the foundation for achieving carbon neutrality goals. Among these, the Huangdao factory has taken the lead in committing to the Science Based Targets initiative (SBTi), expecting validation and official announcement by 2025.

Looking ahead, Hisensehitachi will advance with even greater determination in driving green and low-carbon transformation. The Company is not only committed to achieving its own sustainable development but will also serve as an industry benchmark, leading the entire value chain toward a greener, lower-carbon future.



<sup>8</sup>Absolute Carbon Reduction: The decrease in total carbon emissions compared to the baseline year (2023)

<sup>9</sup>Carbon Intensity Reduction: The decrease in carbon emissions per 10,000 yuan of output value compared to the baseline year (2023)



# 01

## Strengthening Low-carbon Management and Building Management Systems

Aligning with international climate action, China has incorporated "dual carbon" goals into government work reports and the "14<sup>th</sup> Five-Year Plan," making green development a key national strategic policy. As an industry pioneer, Hisensehitachi actively assumes corporate social responsibility, fully advancing implementation of its own carbon neutrality strategy, promoting internal green operations, and contributing to national "dual carbon" goals achievement. In management, Hisensehitachi has not only built a comprehensive "energy-carbon" management system ensuring clear responsibilities and objectives but also deeply integrated green low-carbon concepts into corporate culture, comprehensively promoting enterprise green transformation.

"Energy-Carbon" Management System

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Green Low-carbon Culture

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## Strategic Guidelines

## "Energy-Carbon" Management Architecture

**Strengthening Structural Support:**  
Ensure clear division of responsibilities and hierarchical implementation of energy and carbon management, enhancing decision-making efficiency and execution effectiveness.

## "Energy-Carbon" Management Policies

**Improving System Framework:**  
Ensure "energy-carbon" management follows clear guidelines and standards, promoting efficient operation and iterative optimization of "energy-carbon" management.

## "Energy-Carbon" Performance Assessment

**Strengthening Performance Feedback:** Establish scientific and rational "energy-carbon" performance indicator system, incentivize optimization and improvement of management work, ensure achievement of management objectives.

## "Energy-Carbon" Management System



Green Low-carbon Culture

## Establishing a Sustainable System for Low-carbon Talent Development:

Enhance the reserve of specialized low-carbon professionals to drive the company's low-carbon transformation; strengthen company-wide carbon literacy education to foster a culture of low-carbon learning.

## Low-carbon Capability Development



## Enhancing Employee Carbon Awareness:

Innovate carbon consciousness promotion through initiatives such as low-carbon energy efficiency themed campaigns and green carbon reduction community engagement projects.

## Low-carbon Awareness Promotion



## Promote a new paradigm of low-carbon office practices:

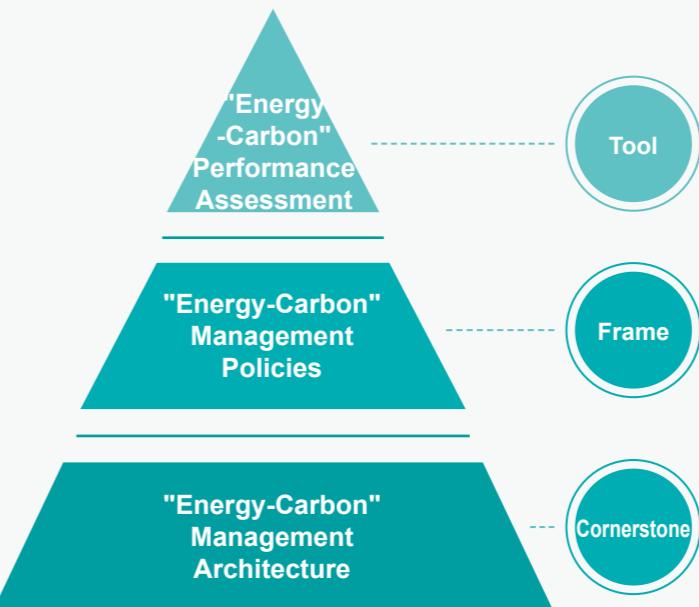
integrate low-carbon behavior guidance into daily management processes.

## Promoting Low-carbon Office Operations



## "Energy-Carbon" Management System

## Achievements

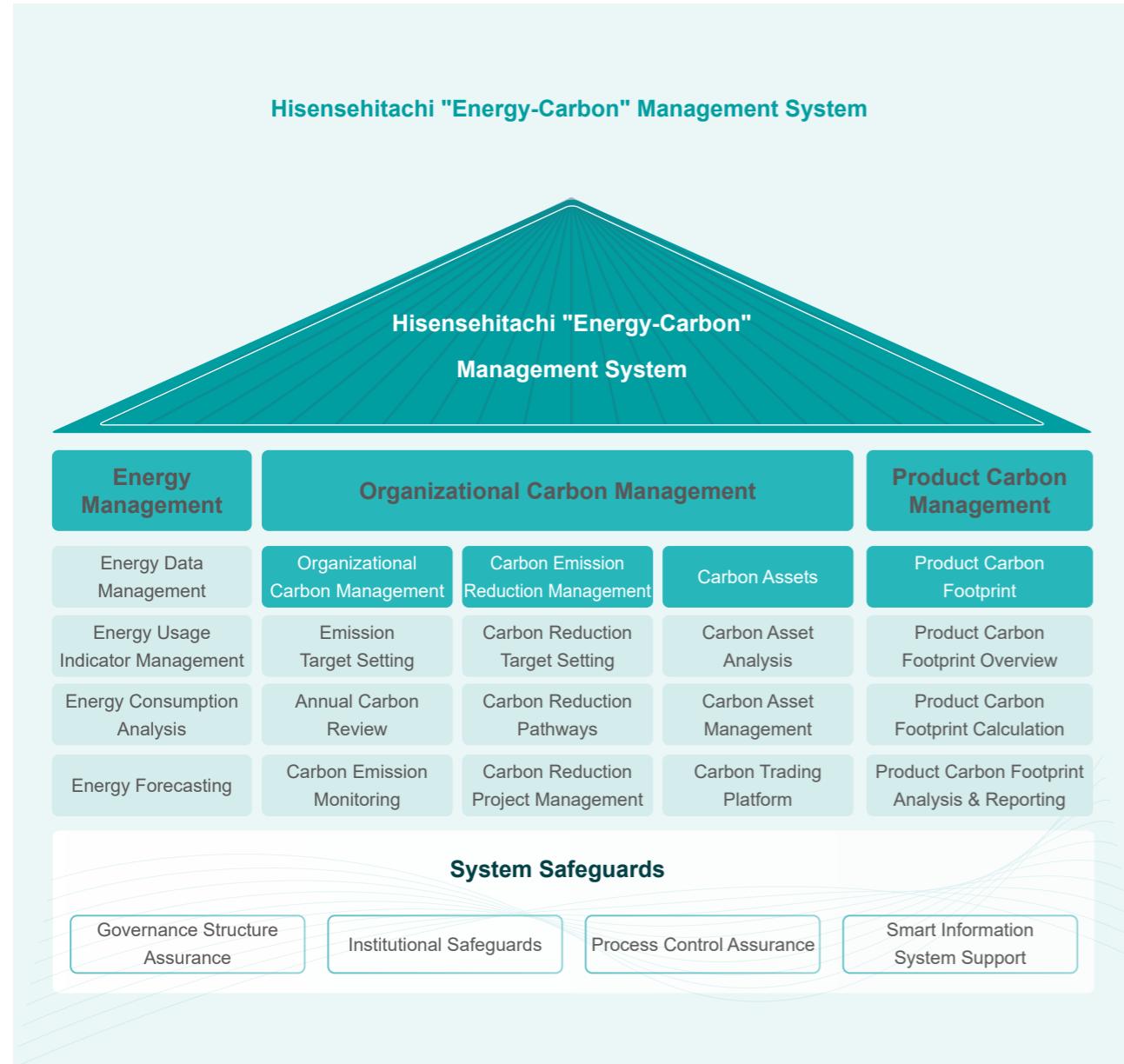


- Establish a carbon tracking system covering 4 major modules: electricity, heat, refrigerant emissions, and reduction targets.

- Issued/revised 26 energy management regulations
- 100% of factories achieving ISO 50001 certification.

- Establishing a Three-Tier "energy-carbon" Management Framework
- Form an "energy-carbon" Executive Steering Committee, under which 4 Energy and Carbon Management Task Forces are established.



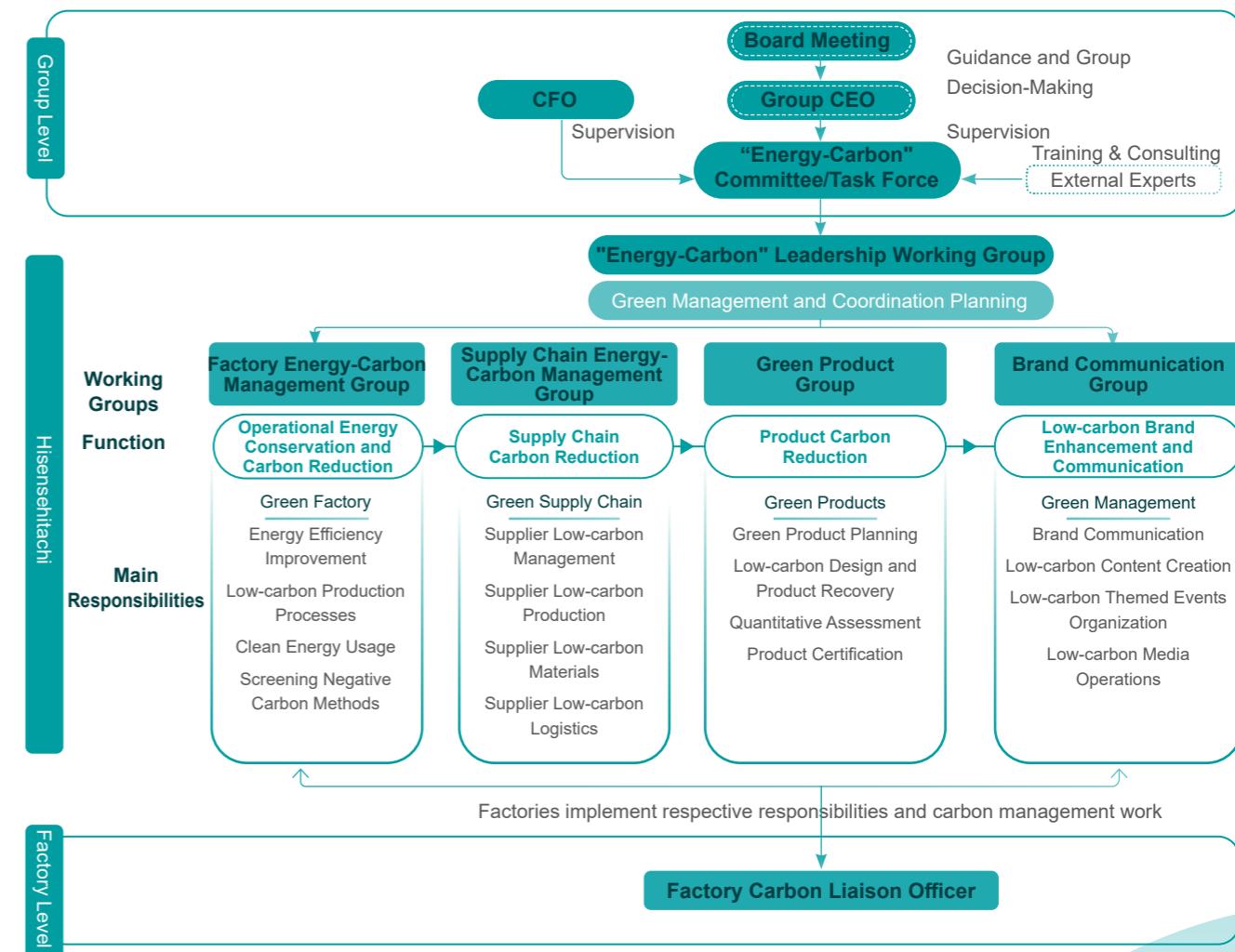


## "Energy-Carbon" Management Architecture

Hisensehitachi has established the "energy-carbon" management system (hereinafter referred to as "system") combining its own reality and carbon neutrality strategic planning. Through formulating comprehensive systems and process standards, supported by information management systems, we provide assurance for the "energy-carbon" management system, enabling Hisensehitachi to comprehensively and efficiently monitor and manage its energy use, carbon emission data, carbon reduction progress, and carbon asset status.

Hisensehitachi continuously strengthens the top-level design of the "energy-carbon" management system, building a three-layer "energy-carbon" management architecture. The Company has established an "energy-carbon" leadership working group, which as the decision-making level is responsible for connecting with Hisense Home Appliance Group's "energy-carbon" management requirements and formulating "dual carbon" and energy management strategic planning. The "energy-carbon" management working group beneath it is responsible for assisting the management working group's work, combining company actual situations and industry development trends to formulate specific "energy-carbon" management planning, orderly and efficiently promoting planning implementation.

### "Energy-Carbon" Management Structure





## "Energy-Carbon" Management Policies

Based on Hisense Home Appliances Group's "Company Energy Management Regulations," "HSE Key Performance Indicator (KPI) Responsibility Letter," and "Occupational Health, Safety and Environmental Responsibility Target Assessment Standards," Hisensehitachi has formulated the "Energy Management Control Procedure" (hereinafter referred to as the "Procedure") covering both energy and carbon management. The Procedure provides institutional guidelines across multiple dimensions including strategy, organization, implementation, and assessment. Additionally, considering industry characteristics, we have established the "Refrigerant Control Management Specifications" to manage refrigerant usage, leakage rates, and recycle. The Company has developed a series of systems to provide institutional support for its "Energy-Carbon" management work.

The Procedure not only defines energy management and carbon management concepts such as energy types and energy units but also clearly delineates the responsibilities of various levels within the energy-carbon management structure. This lays the foundation for the orderly implementation of energy-carbon management work and improves management efficiency. The procedure systematically standardizes various aspects of energy-carbon management, from setting energy-carbon indicators to collecting energy-carbon data, from strict requirements for daily control to refined management of energy-saving projects, all with clear standards and processes. The Procedure stipulates that the Company must establish overall and monthly control indicators for the following year in the fourth quarter based on the group's energy conservation and carbon reduction management requirements and the company's financial cost reduction management requirements. The energy-carbon coordination management department is required to calculate the previous month's various indicator data at the beginning of each month to provide solid data support for management decisions. For units showing abnormal exceedances, the procedure stipulates strict accountability mechanisms, requiring responsible departments to conduct in-depth analysis of causes, promptly submit improvement countermeasures, and actively implement them in subsequent work. If the same unit shows abnormal exceedances for two consecutive times, the Company will conduct assessment notifications according to the procedure to strengthen accountability and promote problem rectification. Furthermore, the Procedure innovatively links energy conservation and carbon reduction effects with employee performance, setting reward amounts proportionally based on the actual energy conservation and carbon reduction achieved by projects, encouraging various departments and individuals to actively participate in energy conservation work.

### Main Content of Hisensehitachi "Energy Management Control Procedure"

#### Clear Concepts

Defining the Scope of Hisensehitachi's "Energy-Carbon" Management Framework

- Define basic concepts of energy, energy consumption units, unit product energy consumption, etc. Clarify the boundaries of Hisensehitachi's energy-carbon management matters

#### Clear Responsibilities

Establishing Clear Departmental Accountability for "Energy-Carbon" Management within Hisensehitachi

Based on existing departmental functions, assign corresponding energy and carbon management responsibilities

"Energy-Carbon" System Management Department	Direct "Energy-Carbon" Management Departments	Other "Energy-Carbon" Using Departments
<ul style="list-style-type: none"> <li>Coordinate with group-level energy and carbon management requirements to organize and promote company-wide energy conservation and carbon reduction</li> <li>Responsible for establishing and breaking down annual and monthly energy-saving and carbon reduction targets</li> <li>Responsible for collection, statistics, analysis, and monitoring management of company energy and carbon emission data</li> </ul>	<ul style="list-style-type: none"> <li>Responsible for departmental energy and carbon management, identifying and driving the implementation of energy-saving and emission reduction measures</li> <li>Assign energy and carbon management personnel to coordinate with energy-saving and carbon reduction management</li> </ul>	<ul style="list-style-type: none"> <li>Responsible for implementing daily management according to energy-saving and carbon reduction requirements</li> </ul>

#### Clear Processes

Standardizing "Energy-Carbon" Management Procedures and Processes at Hisensehitachi

<b>Setting "Energy-Carbon" Indicators</b>	<b>"Energy-Carbon" Data Collection</b>	<b>Strengthen Daily Energy Management Control</b>	<b>Improve Assessment and Incentive Mechanisms</b>
<ul style="list-style-type: none"> <li>Energy consumption unit reduction targets</li> <li>Fuel and power cost control indicators</li> </ul>	<ul style="list-style-type: none"> <li>Daily energy and carbon data collection and management to ensure authentic and effective disclosure of energy and carbon data</li> </ul>	<ul style="list-style-type: none"> <li>Special management of leakage prevention</li> <li>Management of energy waste behaviors</li> <li>Daily inspection of energy facilities</li> </ul>	<ul style="list-style-type: none"> <li>Energy conservation and carbon reduction benefit reward mechanism</li> <li>Differentiated performance evaluation</li> </ul>



## "Energy-Carbon" Performance Assessment

To ensure effective implementation of "Energy-Carbon" management initiatives, Hisensehitachi has constructed an "Energy-Carbon" performance evaluation system, striving to create a highly efficient work model where "every task has a goal, every item has a result, and every action has feedback."

Hisensehitachi implements the overall "Energy-Carbon" management goals at the Hisense Group level. Combined with the company's business conditions and future planning, we form practical annual and monthly "Energy-Carbon" indicators through "layer-by-layer decomposition and step-by-step implementation." We propose differentiated performance evaluation plans for "Energy-Carbon" management departments and responsible individuals, and regularly evaluate, monitor, track, and review the completion of "Energy-Carbon" performance. Through "level-by-level tracing," we ensure the effective implementation of the company's overall "Energy-Carbon" management plans and objectives.



### "Energy-Carbon" Performance Assessment Process

Every task has targets, Every action has outcomes, Every matter has follow-up



# Green Low-carbon Culture

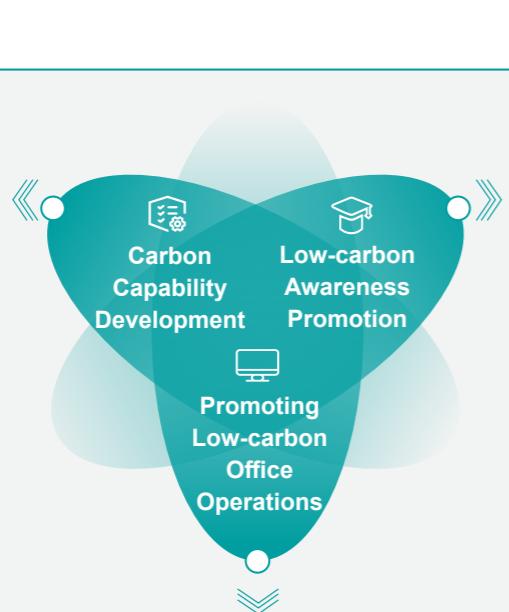
## Achievements

- Company-wide Low-carbon Capability Building

Conducted internal training covering "Dual Carbon Basic Knowledge," "Carbon Inventory Operation Specifications" and other topics, with **552** participants in 2023

- Low-carbon Professional Talent Development

Invited third-party institutions to conduct training, with **80%** of core low-carbon management employees obtaining ISO14064 Greenhouse Gas Internal Verifier certificates



- Organized Energy Conservation and Environmental Protection Themed Activities

Such as themed lectures, promotional brochures, knowledge competitions, etc., with **1,450** participants.

- Launched Green Low-carbon Public Welfare Projects

Created **12** brand public welfare activities including the "Hitachi Sea Buckthorn Public Forest Project" and "Carbon Green Silk Road" Hisense Desert Oasis Co-construction Action

- Optimized lighting system

Office energy consumption decreased by **12%** year-on-year in 2023

- Improved water efficiency

Office water consumption decreased by **6%** year-on-year in 2023

- Promoted paperless office

Saved approximately **146,300** sheets of paper demand in 2023

Hisensehitachi is committed to building a green low-carbon culture system to stimulate employees' environmental awareness and thus promote the company's green transformation. We regularly conduct low-carbon capability training and low-carbon awareness promotion activities to cultivate employees' low-carbon capabilities and consciousness. Meanwhile, we actively create a green low-carbon office environment and strengthen employee low-carbon behavior guidance.



## Low-carbon Capability Development

Hisensehitachi continues to implement its corporate carbon neutrality strategy, enhancing employees' low-carbon capabilities and skills through professional training in carbon management, carbon verification, and other areas. This strengthens the company's low-carbon professional talent pool and supports Hisensehitachi's low-carbon development.

In 2023, Hisensehitachi organized multiple external training sessions for employees, covering courses such as "carbon emission management," "energy management," and "carbon verification internal auditor." All core staff in the company's low-carbon management positions participated in relevant training conducted by qualified third-party institutions, with over half of the core staff successfully obtaining ISO14064 greenhouse gas internal verifier certificates. Furthermore, for non-core low-carbon management employees, Hisensehitachi organized training on "dual carbon basic knowledge," "carbon inventory operation specifications," and "product carbon and carbon asset interpretation" to help employees understand carbon-related knowledge and enhance their low-carbon awareness.

### Internal Training

Regularly organize internal low-carbon capability training, including Low-carbon technology training, Industry knowledge updates, and so on

### External Training

Encourage employees to participate in external training and provide learning subsidies and study leave



## Low-carbon Awareness Promotion

Hisensehitachi encourages employees to actively engage in energy conservation and environmental protection actions in daily office scenarios through various energy management measures and incentive systems. The Company continuously cultivates employee low-carbon awareness through daily publicity, establishing "Energy Conservation and Environmental Protection Month" and encouraging employee participation in low-carbon public welfare activities.

### Case | Promoting "Green Factory and Energy Conservation" Themed Activities to Enhance Employee Low-carbon Awareness

During Hisensehitachi's "Energy Conservation and Environmental Protection Month," multiple departments collaborated to implement various low-carbon innovation awareness campaigns. These initiatives effectively improved employee awareness of energy conservation and environmental protection, creating a company-wide atmosphere of "Working Together Towards Carbon Reduction".



### Themed Lectures

During the campaign, the Company organized multiple lectures focused on "energy conservation and emission reduction." Through screening educational videos and sharing energy-saving case studies, these sessions conveyed low-carbon development concepts to employees, encouraging them to "identify carbon reduction opportunities and contribute suggestions" to help uncover operational emission reduction potential.



### Promotional Materials

Hisensehitachi regularly displays energy conservation and emission reduction posters and promotional materials in campus bulletin boards and information corners. The Company also regularly distributes educational handbooks and articles through employee office software and management platforms, consistently reminding employees to keep "energy conservation and carbon reduction" principles in mind.



### Knowledge Competition

The Company organized an "Energy Conservation Knowledge Quiz" for all employees, popularizing energy-saving tips for both production and daily life, helping employees build a comprehensive knowledge network and framework for energy conservation and carbon reduction.



Energy Conservation Poster



Employees Gathered to Watch Energy Conservation Educational Video


**Case | The "Carbon Dreamer" Initiative - Leading More People Toward a Low-carbon Future**

Hisensehitachi actively practices its brand position as a "green public welfare pioneer" through the "Carbon Dreamer" initiative. The Company continues to explore opportunities in four key areas: "Low-carbon and Zero-carbon New Products and Technologies," "Dual Carbon Project Application Tours," "Dual Carbon Public Welfare Activities," and "Industry Dual Carbon Leadership," taking on corporate responsibility for protecting a green, low-carbon ecosystem.

In the "Dual Carbon Public Welfare Activities" area of Hisensehitachi's "Carbon Dreamer" initiative, the Company encourages employees to actively participate in low-carbon public welfare actions and cooperate with various parties to develop green and low-carbon public welfare projects. In 2023, Hisensehitachi launched multiple public welfare activities, creating branded initiatives such as the "Hitachi Jujube Tree Public Welfare Forest Project" and the "Carbon Green Silk Road" Hisense Desert Oasis Co-construction Action.

Down-to-earth, advancing together for the greater good. Looking forward, Hisensehitachi will continue to carry out low-carbon public welfare activities and expand the scope of these initiatives, with the aspiration of writing Hisensehitachi's 'spirit of low-carbon public welfare' across our nation's magnificent landscapes.



Hisensehitachi 'Carbon Dreamer' Initiative Public Welfare Activities


**Promoting Low-carbon Office Operations**

Hisensehitachi emphasizes cultivating new low-carbon office practices, focusing on three major areas: office electricity consumption, water usage, and office supplies. The Company continuously promotes energy and water conservation initiatives and paperless office practices, strengthens employee guidance on low-carbon behaviors, and jointly creates a green, low-carbon office environment.

In 2023, Hisensehitachi implemented multiple low-carbon office measures,

achieving  
**12%**

year-on-year reduction in office energy consumption

**6%**

year-on-year reduction in office water consumption

and approximately  
**146,300**

sheets of paper saved

**Office Electricity Usage**

- ▶ **Optimize Lighting Equipment:** Use energy-efficient lighting fixtures in offices to reduce lighting energy consumption
- ▶ **Smart Lighting System:** Install features like timed switches to ensure automatic light shutdown after employees leave

**Office Water Usage**

- ▶ **Maintain Water Equipment:** Conduct regular inspections of faucets and pipes, promptly repair any leaks to prevent resource waste
- ▶ **Apply Sensor Systems:** Install water-saving faucets and sensor-based flushing systems in restrooms to effectively reduce water consumption and improve water efficiency

**Office Supplies**

- ▶ **Optimize Office Supplies:** Encourage employees to use double-sided printing and promote reusable office supplies (such as whiteboards, reusable spiral binders instead of staples or tape)
- ▶ **Promote Paperless Office:** Continuously optimize digital office systems, implement paperless approvals through online collaboration tools and OA platforms to significantly reduce reliance on paper documents



# 02

## Promoting Green Smart Manufacturing & Leading Low-carbon Operations

As the Fourth Industrial Revolution continues to accelerate, Hisensehitachi actively engages in smart manufacturing innovation practices, committed to promoting the in-depth application of digital intelligence technology in green production. The Company has constructed a four-tier emission reduction pathway: "implementing energy-saving technical reforms, innovating digital intelligence integration, optimizing energy structure, and screening negative carbon technologies" to continuously reduce carbon emissions in the production process. Through continuous advancement of low-carbon green production methods, Hisensehitachi successfully earned the national "Green Factory" designation in 2022 and was listed among the Ministry of Industry and Information Technology's Smart Manufacturing Demonstration Factories in 2023.

[Energy Conservation and Technical Retrofit](#)

26

[Innovating Digital Intelligence Integration](#)

27

[Optimizing Energy Structure](#)

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[Screening Carbon Negative Technologies](#)

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 Strategic Guidelines

**Priority 4: Screening Carbon Negative Technologies**

 Carbon Capture and Storage  
Carbon Storage and Sequestration

**Priority 3: Optimization of Energy Infrastructure**

 Fossil Fuel Replacement Initiative  
Solar-Storage Infrastructure Development

**Priority 2: Innovating Digital Intelligence Integration**

 Digital Platform Development  
Smart Factory Implementation

**Priority 1: Energy Conservation and Technical Retrofit**

 Equipment Upgrades  
Technical Innovation  
Process Optimization  
Refrigerant Management

**Promote Fossil Energy Replacement**

- Promote energy source transition and build a diversified clean energy system


**Deploy Photovoltaic Energy Solutions**

- Increase photovoltaic energy utilization and build a green power self-sufficiency system


**Build Digital Platform**

- Deepen digital-intelligent integration and build a long-term energy efficiency and carbon management platform
- Lead intelligent manufacturing and create sustainable, high-efficiency smart green factories


**Create Smart Green Factory**

- Lead intelligent manufacturing and create sustainable, high-efficiency smart green factories


**Equipment Upgrades**

- Introduction of high-efficiency equipment
- Energy efficiency upgrades for existing equipment


**Technical Innovation**

- Explore and implement energy-efficient technologies, such as heat recovery systems
- Integration of front-end aluminum process technology
- Drive digital intelligent optimization of manufacturing processes


**Process Optimization**

**Refrigerant Management**

- Establish carbon emission management system
- Standardize equipment maintenance procedures
- Equipment renewal and low-carbon modification

# Energy Conservation and Technical Retrofit

## Achievements

- LED lighting upgrades achieved annual carbon reduction of **467 tCO<sub>2</sub>e**
- Intelligent chiller upgrades achieved annual carbon reduction of **929 tCO<sub>2</sub>e**



- Combined IoT, AI algorithms and other emerging technologies to optimize process parameters, achieved annual carbon reduction of **293 tCO<sub>2</sub>e**

- Deepened waste heat recovery technology applications, achieved annual carbon reduction of **1,914 tCO<sub>2</sub>e**

- Tracked refrigerant carbon emissions, routinized equipment inspections and maintenance, reduced dispersion rate, achieved annual carbon reduction of **44,173 tCO<sub>2</sub>e**

 Successfully selected as national-level '**Green Factory**' for the year 2021 in 2022

 Two production lines received **carbon neutrality certificates** from China Quality Center

Hisensehitachi's Production Line Carbon Neutrality Certificate



Hisensehitachi's Green Factory Evaluation Certificate



In the HVAC industry's journey toward green transformation, technological innovation plays a crucial role. Accelerating the research, development and promotion of advanced energy-saving and carbon-reduction technologies is one of the key means to accelerate the green transformation of development methods<sup>10</sup>. Hisensehitachi adheres to the path of technological innovation, continuously exploring new technologies and processes in the green low-carbon field, helping the HVAC industry's green and low-carbon development.

Hisensehitachi continues to deeply explore carbon reduction potential at the production end, focusing on four core strategies: equipment upgrades, technical innovation, process optimization, and refrigerant management, to promote the efficient use of resources such as water, electricity, gas, steam, and refrigerants, striving to comprehensively advance energy conservation and carbon reduction work in manufacturing.

In terms of equipment improvement, the Company has introduced high-efficiency energy-saving equipment and upgraded existing equipment with intelligent features. For technical innovation, Hisensehitachi actively explores energy-saving technology applications. Process optimization leverages technological integration to achieve intelligent and refined control of process parameters. As for refrigerant management, Hisensehitachi uses carbon emission accounting as a foundation to precisely understand refrigerant charging dispersion in production links, while combining algorithm analysis and other management tools to regularly monitor potential leakage sources and promptly conduct equipment maintenance, effectively reducing leakage risks. Hisensehitachi also actively adopts environmentally friendly refrigerants to replace traditional high Global Warming Potential (GWP) products, reducing greenhouse gas emissions from the source, while strengthening cooperation with recyclers to improve refrigerant recovery efficiency and proportion, forming closed-loop management.

Thanks to the implementation of these comprehensive measures, two of Hisensehitachi's production lines have successfully obtained carbon neutrality certificates from China Quality Certification Center, marking significant achievements in energy conservation, carbon reduction, and green production, setting an example of green transformation for the industry.

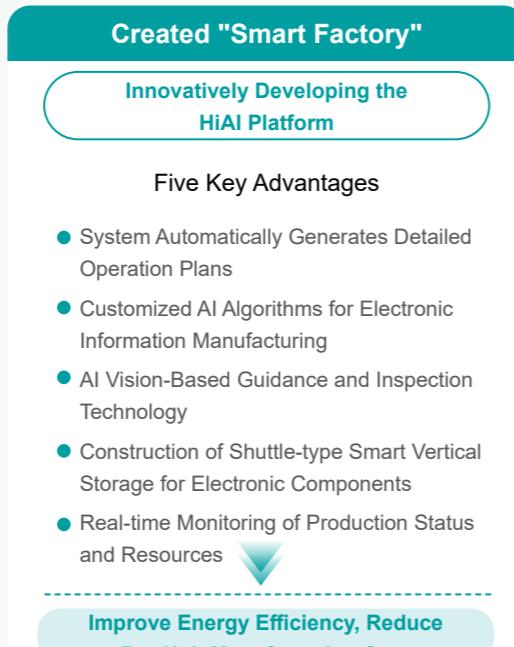
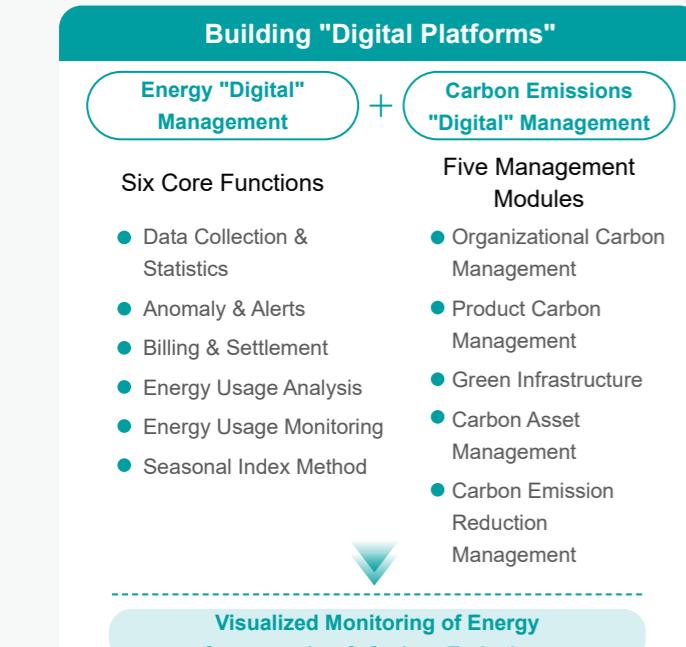
<sup>10</sup> Report of the 20th National Congress of the CPC

## Outstanding Energy Conservation Projects

Category	Project Name	Carbon Reduction Result
Process Optimization	Cloud-based Smart Control Project for Air Compressors:	Annual carbon reduction of approximately 293 (tCO <sub>2</sub> e)
Technical Innovation	Air Compressor and Cooling Water Waste Heat Recovery Project:	Annual carbon reduction of approximately 1914 (tCO <sub>2</sub> e)
Equipment Upgrades	Laboratory Variable Refrigerant Flow Control Technology:	Annual carbon reduction of approximately 467 (tCO <sub>2</sub> e)

## Innovating Digital Intelligence Integration

### Achievements



Selected as Ministry of Industry and Information Technology **Smart Manufacturing Demonstration Factory** in 2023

Hisensehitachi deepens the application of "digitalization" in the manufacturing process while applying new-generation "intelligent" information technologies such as big data, artificial intelligence, and industrial internet to energy efficiency improvement and resource management, promoting the integration of "digital intelligence" to empower enterprise greening.

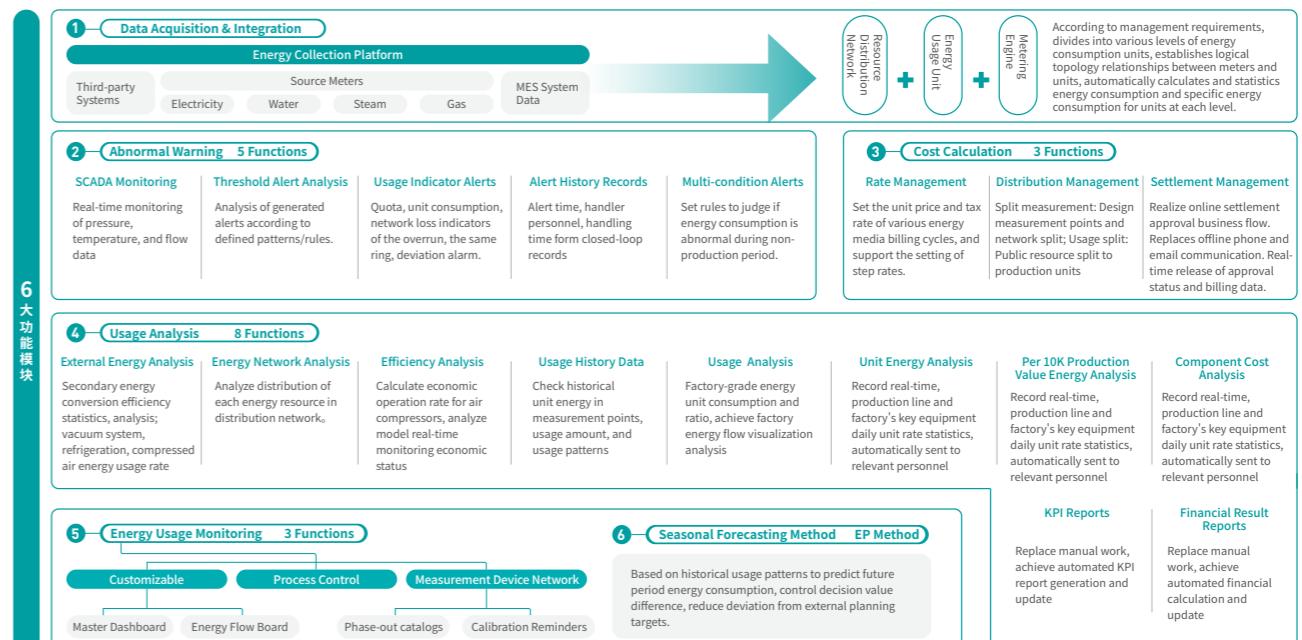


## Utilizing "Digital" Platforms

### Energy "Digital" Management

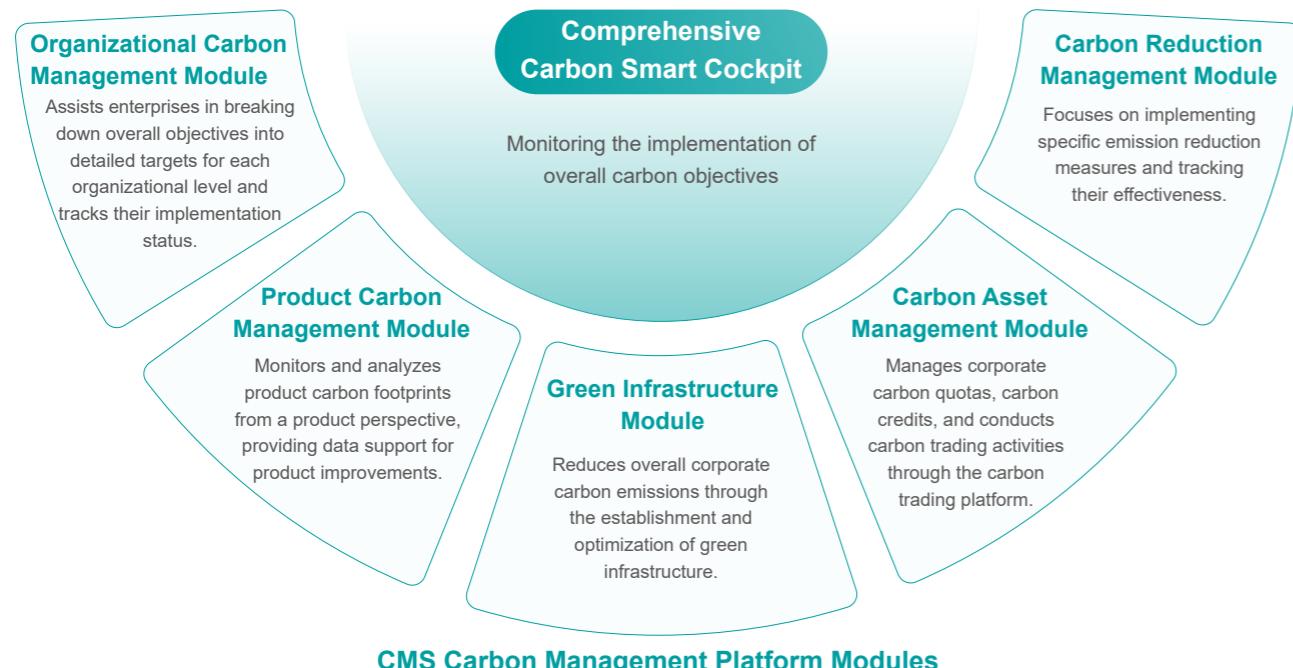
Hisensehitachi is a pioneer in the industry to use information technology-based energy management systems, empowering green energy-saving smart manufacturing for cost reduction and efficiency improvement. The energy management system includes six core functions that can accurately collect energy usage data and issue real-time alerts when energy indicators exceed preset values, allowing management personnel to respond quickly. Using the system's energy usage analysis and prediction functions, Hisensehitachi can accurately grasp energy consumption conditions, identify energy-saving potential, and effectively evaluate the effectiveness of energy-saving measures. These functions provide Hisensehitachi with better energy allocation and help the Company achieve its carbon neutrality strategic goals.

### Hisensehitachi Energy Management Information System



## Carbon Emissions "Digital" Management

Hisensehitachi continues to explore new models of low-carbon digitalization. In carbon management, based on the "Energy-Carbon" management system, Hisensehitachi has introduced the Carbon Management System (CMS) platform. The platform covers multiple modules, including a comprehensive carbon cockpit, organizational carbon management, carbon reduction management, product carbon management, carbon asset management, and green infrastructure, comprehensively helping Hisensehitachi efficiently manage carbon emissions in production and business activities.



## CMS Carbon Management Platform Modules



CMS Comprehensive Carbon Smart Cockpit

## Creating "Smart" Factories

Hisensehitachi persists in building a high-quality sustainable development path driven by digitalization, and continues to invest in enterprise intelligence development. We have constructed a comprehensive intelligent manufacturing architecture, ensuring technology integration and upgrading throughout the entire process from R&D to process to manufacturing, creating an advanced manufacturing mode of "dual improvement in quality and efficiency," continuously promoting green smart manufacturing, and building a "digitally intelligent" integrated "smart" factory.

Hisensehitachi has innovatively created the "HiAI Platform" smart factory solution, which has five key advantages:

- System automatically generates detailed operation plans
- Customized AI algorithms for electronic information manufacturing
- AI vision-based guidance and detection technology
- Built electronic component smart shuttle-type vertical storage
- Real-time monitoring of production status and resources

This platform has effectively improved energy utilization while reducing per-unit manufacturing costs, achieving cost reduction and efficiency improvement. The "HiAI Platform" was also successfully selected as an excellent case of digital empowerment for new industrial innovation practices at the 2023 Digital Technology Innovation Development Conference. Additionally, due to its innovations in digitalization and intelligence, Hisense successfully entered the Ministry of Industry and Information Technology's list of Smart Manufacturing Demonstration Factories in 2023.



"HiAI Platform" Smart Manufacturing Factory Solution was selected as an outstanding case of digital empowerment for new industrialization innovation practices

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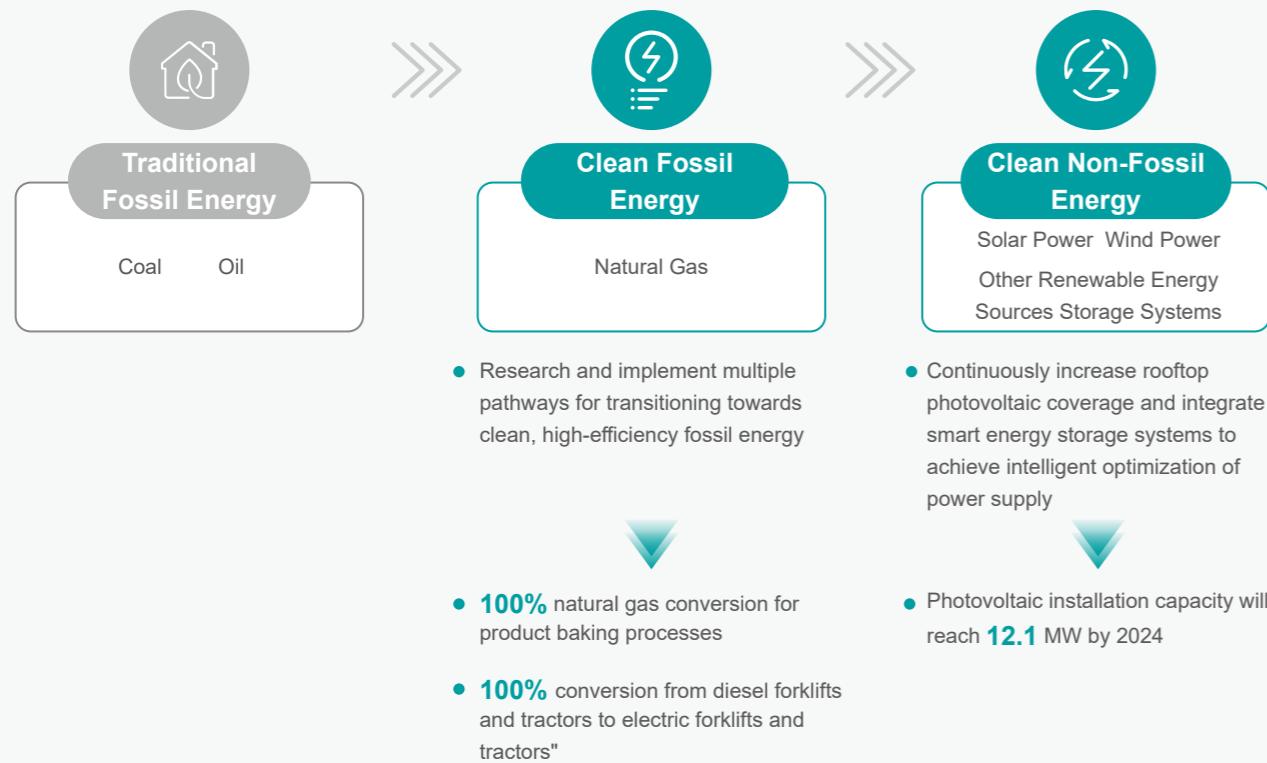
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# Optimizing Energy Structure

## Achievements



Achieve 100% renewable energy usage by 2038



Energy is an important material foundation for economic and social development, and also the main source of carbon emissions<sup>11</sup>. "Vigorously implementing renewable energy substitution and accelerating the construction of a clean, low-carbon, safe and efficient energy system"<sup>12</sup> is one of the important paths to achieve society-wide low-carbon development goals. To this end, Hisensehitachi actively constructs an "Enterprise Clean Energy System," continuously exploring the energy transition path from "clean fossil energy"<sup>13</sup> to "clean non-fossil energy,"<sup>14</sup> striving to achieve 100% renewable energy usage by 2038.

<sup>11</sup>People's Daily *Promoting Energy Transition and Empowering Green Development*

<sup>12</sup>State Council (PRC) *Carbon Peak Action Plan Before 2030*

<sup>13</sup>National Development and Reform Commission *Opinion on Accelerating Natural Gas Utilization*: (1) Natural gas is a high-quality, efficient, clean and low-carbon energy source that can form positive complementarity with renewable energy development; (2) Accelerating natural gas utilization and increasing its proportion in primary energy consumption is an inevitable path for China to steadily promote energy consumption revolution and build a clean, low-carbon, safe and efficient modern energy system.

<sup>14</sup>China Energy News - Chinese Academy of Macroeconomic Research: Natural gas remains one of the optimal choices during the transition from fossil fuels to non-fossil energy, and will continue to be an important tool for carbon reduction in China's energy system before reaching peak carbon emissions, playing an irreplaceable role.

## Promoting Fossil Energy Replacement

Hisensehitachi emphasizes the use of clean energy, with natural gas becoming the preferred clean fossil fuel in the production process. Through the introduction of advanced production line equipment and adjustment of energy deployment, the Company continues to explore paths for achieving cleaner and more efficient fossil energy use. Currently, Hisensehitachi fully utilizes natural gas as the main energy source in product drying processes.

### Hisensehitachi's Exploration of Traditional Fossil Energy Replacement Methods

Natural Gas

Since the establishment of Hisensehitachi's factory, natural gas has been adopted as the primary energy source, with product baking processes already achieving 100% natural gas utilization as the main energy source

Diesel

All Hisensehitachi's factories have achieved 100% conversion from diesel forklifts and tractors to electric forklifts and tractors

Electricity



### Case | Low-Temperature Volatile Oil Drying Furnace Energy-Saving Renovation Project

In industrial production, drying furnaces are key gas-consuming equipment, and their energy consumption has always been a focus of enterprise energy conservation and emission reduction. Traditional drying furnaces use ordinary volatile oil, requiring higher evaporation temperatures, resulting in large gas consumption. To respond to national energy conservation and emission reduction initiatives while reducing production costs, Hisensehitachi carried out technical renovation of drying furnaces. By switching to high-performance volatile oil, achieving low-temperature operation of drying furnaces, reducing evaporation heat requirements, and thereby reducing gas usage, the project achieves the dual goals of energy conservation and emission reduction and cost control, expecting to reduce annual gas usage by over 600,000 cubic meters.

expecting to reduce annual gas usage by over

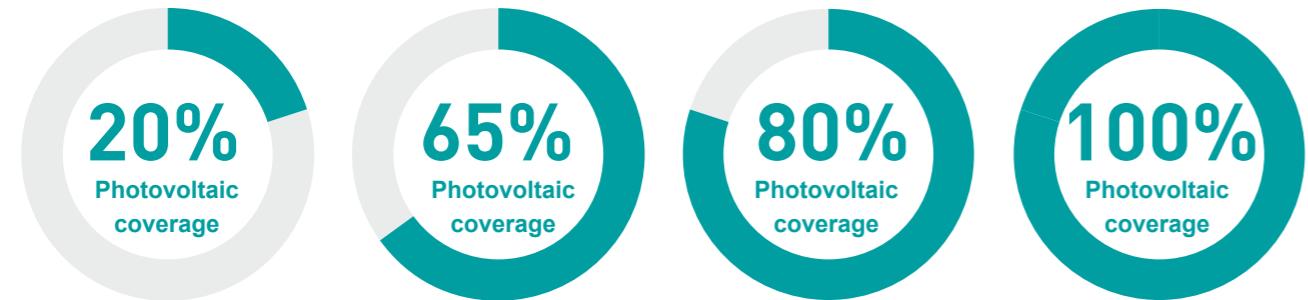
**600,000**  
cubic meters



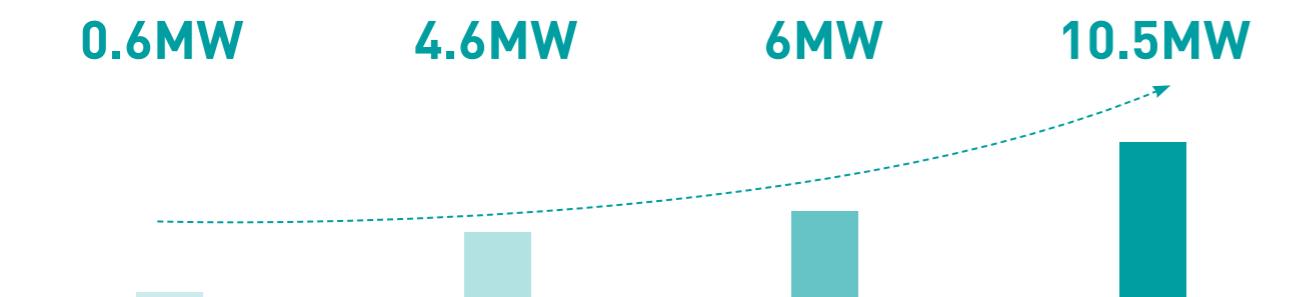
## Deploy Photovoltaic Energy Solutions

Photovoltaic power is one of Hisensehitachi's important clean energy sources. Since 2016, we have begun deploying and using photovoltaic energy. By 2024, Hisensehitachi (Huangdao Factory) will achieve 100% photovoltaic coverage of all office buildings, factories, and car shed roofs. The total installed capacity of photovoltaic equipment will reach 10.5 megawatts, with expected annual power generation of 12,075 megawatt-hours, reducing emissions by over 7,700 tons of carbon dioxide equivalent. Hisensehitachi is also committed to integrating green energy concepts into the planning of new bases, such as the Changsha base, which actively planned photovoltaic power generation projects from its initial preparation.

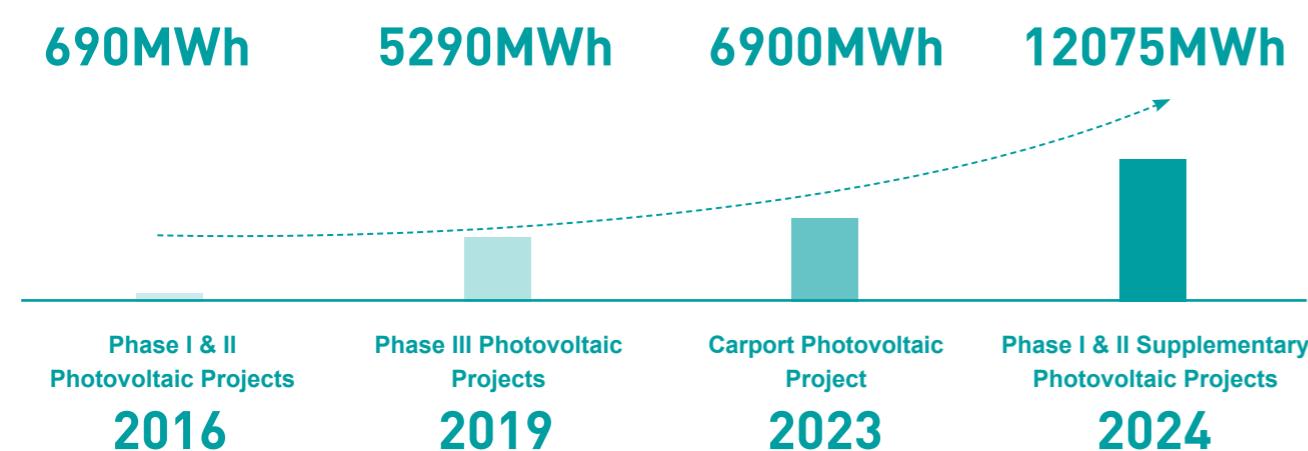
**Hisense-Hitachi Photovoltaic Construction Roadmap**



**Cumulative Installed Capacity**



**Cumulative Annual Power Generation**



Hisensehitachi will continue to promote the use of clean energy in the future, increasing the proportion of self-generated green electricity consumption. Meanwhile, the Company will further achieve corporate carbon reduction through developing or purchasing green certificates and procuring green electricity from external sources. By 2025, the Changsha factory will utilize 100% rooftop photovoltaic power generation for its production operations.

### Case | Smart Battery Energy Storage System Optimizing Power Usage

The Hisensehitachi Huangdao Park has optimized power usage through the introduction of a battery energy storage system. The system, mainly composed of lithium battery groups and energy storage inverters, can intelligently store low-price electricity at night and release it during peak daytime electricity prices, thereby reducing electricity costs while ensuring production.

The park uses the EMS system to monitor load curves, discovering that loads naturally decrease during lunch hours due to employee breaks and improved photovoltaic power generation efficiency. In response to this characteristic, the park plans to deploy two 2500KW/5000KWH energy storage containers, accessing the power grid through 10KV backup switches, achieving two daily charge-discharge cycles to optimize power resource allocation.



## Screening Carbon Negative Technologies

To successfully achieve Hisensehitachi's carbon neutrality strategic goals, the Company plans to screen carbon negative technologies to address carbon emissions that cannot be completely eliminated through active reduction measures. Hisensehitachi actively monitors and evaluates cutting-edge technologies including Carbon Capture and Storage (CCS), Bioenergy with Carbon Capture and Storage (BECCS), and Direct Air Carbon Capture and Storage (DACCs). We will conduct strict project evaluation and verification processes to ensure the authenticity and effectiveness of selected carbon negative measures, guaranteeing transparent and reliable carbon offset activities.

# 03

## Cultivating Green Partners & Streamlining Low-carbon Chain

As an important component of enterprise operations, the supply chain's environmental impact and carbon emissions account for the majority of the entire product life cycle. Hisensehitachi not only actively promotes green transformation in its own operations but also opens a new chapter in low-carbon development through close cooperation with supply chain partners. Hisensehitachi has long held the mission and vision of building a green, resilient, and healthy supply chain as one of its goals, creating the "Hisensehitachi Green Supply Chain Management Circle Model." Hisensehitachi "strengthens management," continuously improving supply chain green management capabilities, while actively sharing green low-carbon resources and working hand in hand with supplier partners to jointly promote the industry's low-carbon transformation.

Supply Chain Low-carbon Management

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Partner Collaboration for Emission Reduction

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Supplier Low-carbon Empowerment

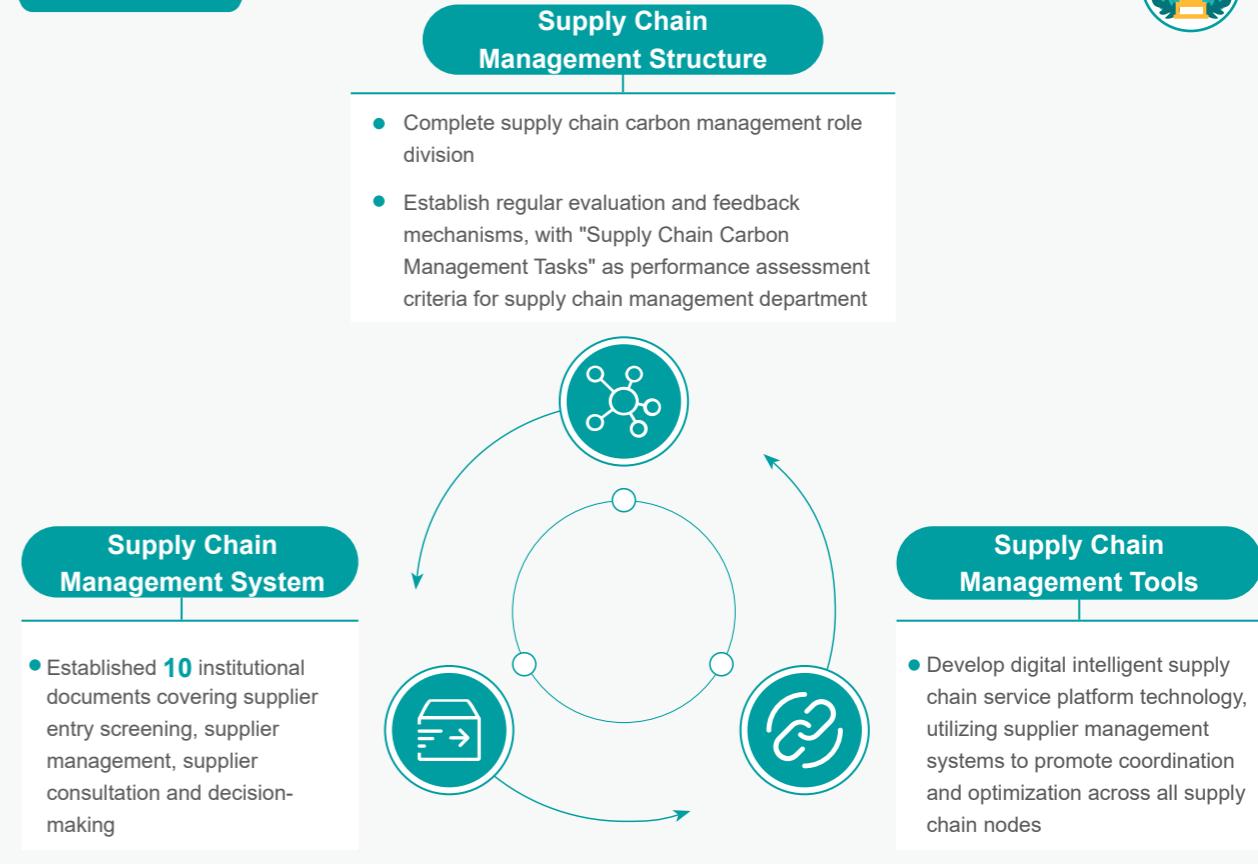
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## Supply Chain Low-carbon Management

### Achievements



In terms of internal supply chain management, Hisensehitachi strengthens its supply chain management foundation through "clarifying management structure," "improving management systems," and "developing digital supply chain management tools," optimizing layer by layer and gradually improving the company's comprehensive green management capabilities over the supply chain.

### Supply Chain Management Structure

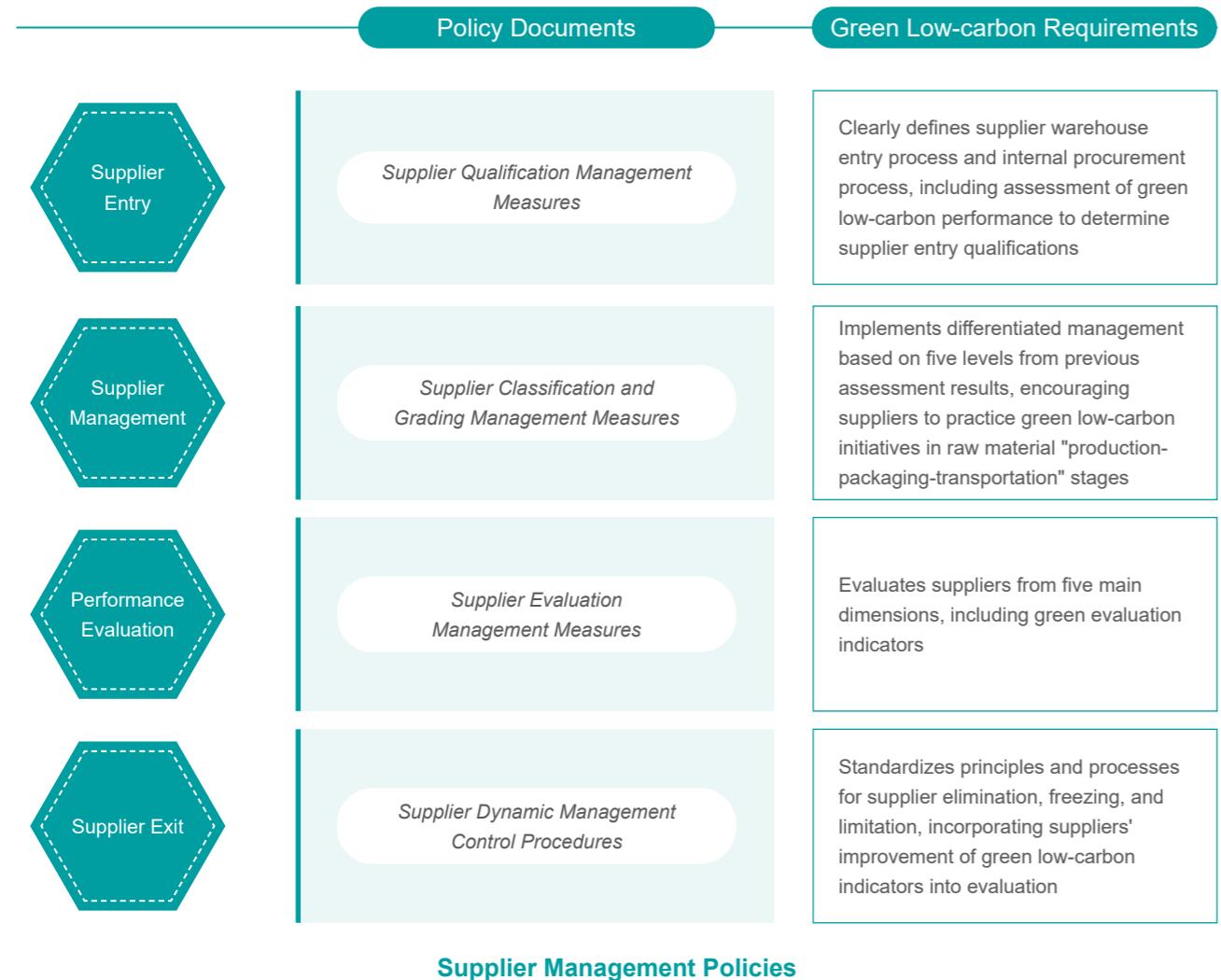
Hisensehitachi upholds the corporate spirit of "Concerted Efforts, Everyone Contributing Their Best," building a professional supply chain carbon management structure, forming comprehensive supply chain carbon management function divisions, and equipping it with management talent possessing professional knowledge and experience to ensure the professionalism and efficiency of supply chain carbon management work.

To ensure the effective implementation of supply chain carbon management work, Hisensehitachi has established regular evaluation and feedback mechanisms, incorporating "supplier carbon management work items" into the performance assessment of supply chain carbon management organizational departments, ensuring that relevant Hisensehitachi departments have clear direction and responsibility in improving supplier carbon management performance. Meanwhile, Hisensehitachi firmly grasps the era's low-carbon development trend, regularly inviting internal and external industry experts to conduct low-carbon supplier management training and other methods to timely input excellent low-carbon management methods and knowledge from the industry internally, identifying the "keywords" and "force points" of low-carbon management, with the hope of continuously improving the ability to manage suppliers' low-carbon performance and promoting the green transformation of the entire supply chain.



## Supply Chain Management Policies

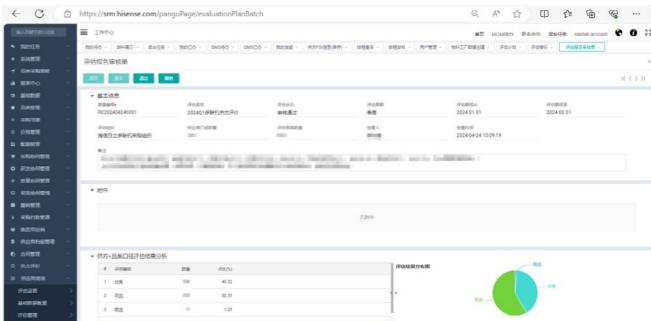
Based on Hisense Group's *Supplier Qualification Management Measures*, *Supplier Classification and Grading Management Measures*, *Supplier Evaluation Management Measures*, *Supplier Dynamic Management Control Procedures* and other institutional requirements, Hisensehitachi actively integrates low-carbon and green development concepts into the entire supply chain management process, covering all stages from supplier introduction, supplier management, supplier performance evaluation to supplier exit.



## Supply Chain Management Tools

Digital transformation is driving Hisense's management reform. To improve supply chain low-carbon management efficiency and accuracy, and timely discover and solve potential problems, Hisensehitachi actively plays its role as a "chain leader," developing digital supply chain service platform technology, using the Supplier Relationship Management (SRM) system to conduct unified management of suppliers' low-carbon, green, and environmental performance in work aspects such as supplier introduction, classification management, and performance evaluation.

This management system deeply promotes the collaborative optimization of various supply chain links, helping Hisensehitachi set supplier emission reduction targets with more basis through intelligent analysis functions. Through digital technology, Hisensehitachi achieves "lean management" of suppliers.



Hisensehitachi Supplier Relationship Management (SRM) System

## Partner Collaboration for Emission Reduction

### Achievements

In 2023,

Hisensehitachi has established collaborative transformation partnerships with **430+** suppliers across the supply chain



Upstream



#### Raw Material Suppliers

- Prioritizing and conducting regular emission assessments with key high-emission suppliers
- Requiring key high-emission suppliers to adopt low-carbon production processes
- Promoting clean energy adoption among suppliers



#### Logistics Suppliers

- Optimizing railway transportation modes
- Cultivating local supply networks
- Implementing temperature control solutions



#### Warehousing Service Providers

- Developing WMS warehouse systems to achieve paperless operations and smart scheduling capabilities
- Promoting the adoption of electric forklifts and other new energy equipment



#### Recycling Partners

- Leveraging the large-scale used appliance recycling platform's IT information system to integrate recycling channels and networks
- Working closely with recyclers to promote directional green recovery of refrigerants



- In 2023, approximately **30%** of key suppliers have initiated or planned to implement carbon emissions reduction initiatives
- In 2023, over **40%** of key suppliers have invested in and implemented clean energy



- In 2023, cultivated **88** local logistics suppliers, achieving a total transportation distance reduction of **506,880** km



- In 2023, benefiting from the paperless order tracking functionality of the WMS warehouse system, achieved a reduction in paper demand of approximately **110,000** sheets
- In 2023, the promotion of new energy equipment facilitated a reduction in oil consumption by **2.8t**



- Promoting the establishment of an "intelligent, efficient, traceable, and online-offline integrated waste home appliance recycling and processing system"

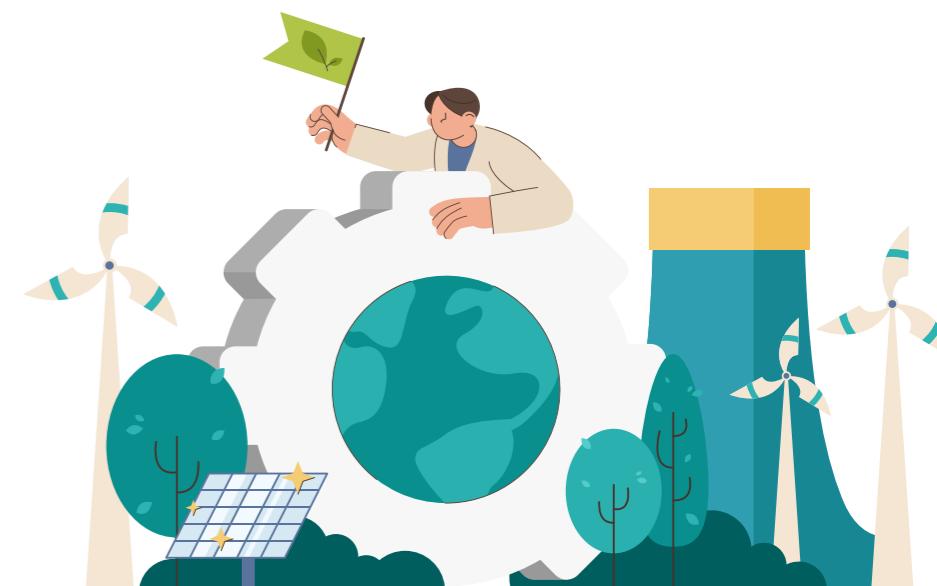


In supplier management, Hisensehitachi adheres to the development concept of win-win cooperation, developing and building the "Three Dimensions · Four Items · One Body" "Hisensehitachi External Supplier Green Closed-loop Management Model," targeting "Raw material suppliers, Logistics suppliers, Warehousing service suppliers" 3 main supplier categories, connecting through supplier full lifecycle "Development and Entry, Classification and Management, Evaluation and Assessment, Exit and Punishment" 4 important management items in 1 set of closed-loop management mode, working hand in hand with upstream and downstream supplier partners to jointly build a low-carbon development industry ecology, driving the value chain to achieve green win-win results.

## Raw Material Supplier Management

Carbon emissions throughout the life cycle of raw materials are an important component of enterprise value chain carbon emissions. Hisensehitachi has long focused on the low-carbon transformation of key raw material suppliers, taking multiple measures to encourage raw material suppliers' low-carbon development. Hisensehitachi encourages key, high-carbon-emission suppliers to regularly conduct carbon emission accounting work, helping suppliers identify high-emission links and comprehensively understand and control carbon emissions at various stages. In 2023, approximately 30% of Hisensehitachi's key suppliers had already conducted or planned to conduct carbon emission work.

Hisensehitachi requires key, high-carbon-emission suppliers to adopt low-carbon production processes, encouraging suppliers to prioritize the use of higher energy-efficiency production equipment, continuously optimize production processes, carry out energy-saving technical transformation projects, and reduce energy consumption. Meanwhile, the Company actively promotes suppliers' use of clean energy, reducing dependence on traditional fossil fuels. In 2023, more than 40% of Hisensehitachi's key suppliers had already invested in clean energy use, contributing to reducing the overall carbon emissions of the supply chain.



### Hisensehitachi's Closed-Loop Green Management Model for External Suppliers



#### Supplier Development and Entry

- Identify potential low-carbon, high-quality green suppliers
- Establish product carbon footprint entry threshold
- Set environmental and low-carbon related behavior standards



#### Supplier Classification and Management

- Classify suppliers based on carbon emissions and procurement volume
- Set carbon reduction baselines according to different classification levels
- Require high-carbon suppliers to initiate carbon reduction related work



#### Supplier Evaluation and Assessment

- Conduct assessments based on low-carbon performance indicators
- Carry out practical audit work to verify supplier performance
- Provide rewards and incentives for outstanding suppliers



#### Supplier Exit and Punishment

- Set clear exit thresholds for high-emission suppliers
- Provide improvement suggestions and support for corrective action plans
- Terminate cooperation with non-compliant suppliers as necessary



## Logistics Supplier Management

Transport emissions account for about 10% of China's total carbon emissions, and the State Council's "Carbon Peak Action Plan Before 2030" proposes to "accelerate the formation of green low-carbon transport modes"<sup>15</sup>. Hisensehitachi highly values partnership with logistics partners in decarbonization, actively encouraging logistics suppliers' low-carbon development through a series of innovative initiatives, effectively reducing carbon emissions from upstream and downstream transport in the enterprise value chain, and jointly promoting the construction of a low-carbon logistics network.



### Raw Material Logistics

- Encourage upstream suppliers to use low-carbon transport methods, such as new energy heavy trucks and rail transport, to reduce dependence on traditional fuel vehicles
- Cultivate local suppliers to reduce freight distance



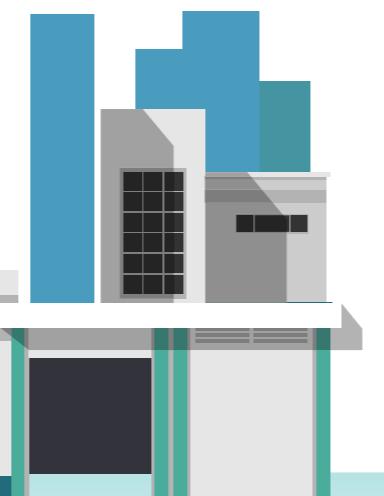
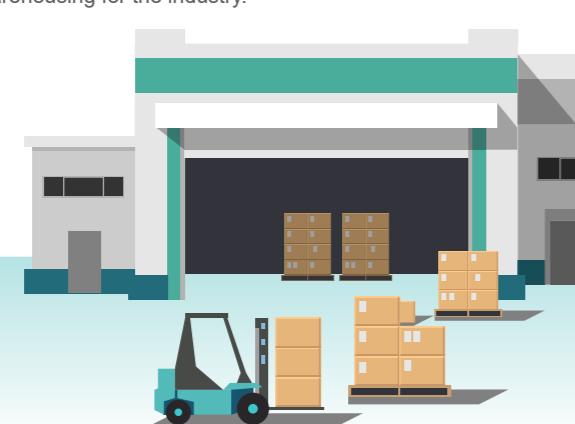
### Product Logistics

- Optimize product packaging volume and stacking logic to improve transport efficiency and reduce transport frequency
- Utilize advanced transport scheduling models and digital simulation technology to optimize transport routes and scheduling plans



## Warehousing Service Supplier Management

Hisensehitachi has developed an advanced WMS warehouse system to improve the intelligence and environmental protection level of warehouse management. This system has achieved paperless order tracking, recording and managing each order information through digital means, greatly reducing paper use and waste. Meanwhile, the WMS system features smart scheduling capabilities, able to conduct intelligent analysis and optimization scheduling based on order demands and inventory conditions, ensuring efficient goods circulation, reducing product retention time in warehouses, thereby reducing additional carbon emissions brought by warehouse lighting, ventilation, HVAC equipment due to long-term storage. Hisensehitachi encourages warehousing service suppliers to use electric forklifts and other new energy equipment to replace traditional fuel equipment, further reducing carbon footprint, to promote the low-carbon development of the entire supply chain and set an example of green warehousing for the industry.



## Product Recycle and Disposal System

Hisensehitachi actively assumes producer responsibility, upholding Hisense Home Appliance Group's commitment to building an "intelligent, efficient, traceable, online-offline integrated waste home appliance recycle and disposal system." By fully developing enterprise information network systems, utilizing sales channel networks, cooperating with compliant home appliance dismantling enterprises, and encouraging targeted recovery of high-carbon-emission key materials, we cultivate the "Hisensehitachi Product Green Low-carbon Recycle and Disposal Model" to achieve comprehensive and effective product recycle and disposal, establishing a model of responsible production and green Recycle.

### Case

#### Leveraging Old Appliance Recycle IT Information System Platform to Connect Comprehensive Product Recycle Network

Hisensehitachi utilizes the Hisense Group's old appliance recycle IT information system platform to accurately track and manage consumer product usage status. Based on each user's specific needs and product conditions, we provide differentiated and customized product recycle services to ensure efficient and convenient recycle processes.

Furthermore, Hisensehitachi is committed to opening up recycle channels and networks, integrating various links including online appointments, logistics transportation, and professional processing to form a comprehensive, seamless recycle ecosystem. This significantly improves product recycle rates, further promotes the development of circular economy and environmental protection goals, and enhances Hisensehitachi's foresight and leadership in digital transformation and low-carbon development.

### Case

#### Partnering with Qualified Third-Party Recyclers to Achieve Targeted Green Recycle of Refrigerants

Hisensehitachi closely collaborates with qualified and technically proficient third-party recycling service providers, focusing on the targeted recycle of high-carbon-emission refrigerants from central air conditioning products. This ensures that refrigerants from end-of-life central air conditioning units are recovered and processed scientifically and safely, reducing atmospheric and ecosystem damage caused by refrigerant dispersal during the recycle and treatment process.

In the Hi-smart H5 series products, Hisensehitachi has introduced R32 refrigerant with a lower Global Warming Potential (GWP). This refrigerant offers multiple advantages including, Lower costs for the same capacity, Easier handling and recovery, Reduced global warming potential.



Hisensehitachi Hi-smart H5 Series Product Launch Event

<sup>15</sup>State Council (PRC) Carbon Peak Action Plan Before 2030

# Supplier Low-carbon Empowerment

## Achievements



### Supplier Low-carbon Training

**Online Training:** Regularly invite core and key suppliers to participate in Hisense Group's online training programs

**Offline Training:** Regularly organize on-site inspection activities to provide face-to-face guidance and technical support for suppliers



### Supplier Partner Conference

Share the latest industry experiences and success cases, and showcase cutting-edge environmental protection technologies and low-carbon solutions

Hisensehitachi places high importance on developing suppliers' low-carbon capabilities. Through low-carbon training and regular partner conferences, the Company shares low-carbon resources, best practices, and innovative solutions to jointly build a cooperative and win-win green ecosystem.



### Supplier Low-carbon Training

Hisensehitachi actively conducts supplier low-carbon training both online and offline through multiple channels and formats. Online, Hisensehitachi regularly invites core and key suppliers to participate in Hisense Group's network training, jointly discussing topics such as green and low-carbon development, sharing the latest environmental protection technologies and low-carbon management experiences, ensuring suppliers can access relevant knowledge anytime, anywhere. Offline, Hisensehitachi regularly organizes on-site inspection activities, visiting suppliers' production and operation sites to provide face-to-face guidance and technical support. This not only enhances suppliers' low-carbon awareness and capabilities but also improves the green competitiveness of the entire supply chain, laying a solid foundation for promoting the industry's low-carbon development.



### Supplier Partner Conference

Hisensehitachi regularly convenes partner summits to jointly plan industry development and corporate future, deepening collaboration. During the conference, Hisensehitachi shares the latest industry experiences and success cases with suppliers, showcasing cutting-edge environmental protection technologies and low-carbon solutions. Hisensehitachi will work hand in hand with suppliers to jointly develop and advance low-carbon strategies, build a green supply chain system, laying a solid foundation for creating a low-carbon future together.

#### Case

#### Hisensehitachi "Perseverance • Smart Transformation • New Direction" 2024 Partner Conference

In March 2024, Hisensehitachi held its 2024 Partner Conference under the theme "Perseverance • Smart Transformation • New Direction." During the conference, Hisensehitachi Executive Vice President Zhang Wenqiang shared in-depth insights about the company's ESG practices and plans for creating a smart green future. Committed to becoming a global leader in central air conditioning, Hisensehitachi has consistently integrated ESG development concepts into its corporate management planning and built an ESG organizational management system over the years. The Company remains focused on enhancing customer satisfaction as its core principle, continuously promoting positive environmental actions, and building brand pillars that demonstrate social responsibility, exemplifying corporate excellence.



Hisensehitachi Executive Vice President Zhang Wenqiang Speaking at the Event



# 04

## Creating Green Products & Promoting Low-carbon Innovation

As a global leader in the central air conditioning industry, Hisensehitachi highly values product greening, health features, and intelligence, continuously improving products' environmental performance and user experience to provide customers with cross-industry, cross-domain commercial air conditioning green solutions. Based on this development goal, Hisensehitachi has developed an "Environmental Innovation 2050" framework covering Hisense, Hitachi, and York's three major brands, conforming to the product life cycle concept.

- Green R&D and Design 50
- Green Product Usage 56
- Green End-of-Life Processing 62
- Green Solutions 64



## Green Product

## Strategic Guidelines



## Green R&amp;D and Design

Build a green and low-carbon product research system to lead sustainable industry development



## Green Product Usage

Create green and intelligent product systems, promoting green consumption transformation



## Green End-of-Life Processing

Optimize product end-of-life recycling systems to promote efficient resource utilization



Clean energy usage



Tiered Energy Efficiency



Smart Product Innovation

Promote low-carbon innovation solutions

## Green Solutions

Taking the core needs of municipal, corporate and residential customers as the starting point, deeply integrating green technologies with application scenarios to promote low-carbon and energy-efficient transformation across multiple industries and domains



## Municipal · Low-carbon Green Building Leadership



## Enterprise · Low-carbon Efficiency Upgrade



## Residential · Low-carbon Comfortable Living



## Green R&amp;D and Design

## Achievements

## Application of Green Materials

- Expanding the proportion of products using clean refrigerants
- Exploring green packaging solutions using biodegradable and recyclable material



By 2025, **100%** of unit machines will use R32 refrigerant

## Product Structure Optimization

- Innovating engineering design and manufacturing processes
- Combining material reduction, material substitution, structural innovation, and packaging simplification to improve product energy efficiency



Revolutionary aluminum-free shaft sleeve design reduces raw material carbon emissions by approximately **10%** per outdoor unit axial fan

## Product Energy Efficiency Improvement

- Researching advanced technologies and combining technological innovation with optimized design to continuously improve air conditioning products' energy utilization efficiency



Water-source VRF achieve **100%** compliance with national Grade-1 energy efficiency standards

Self-developed positive pressure liquid floating oil-free variable frequency centrifugal units can save **222.93** million kWh of electricity per **1,000** units annually

## Promoting Industry Innovation

- Development and Optimization of Low-carbon, Energy-efficient Cooling Technologies



Holding **2,155** central air conditioning and heat pump technology patents, and **73** technologies recognized as internationally leading or advanced by the industry

As of June, 2024, published **28** green low-carbon related national, industry, and group standards

Hisensehitachi consistently considers product environmental performance and carbon footprint as important factors in the product research and development design stage, conducting green product R&D and design from multiple aspects including green environmental protection materials, product weight reduction, and product energy efficiency improvement.

In 2022, Hisensehitachi became the first company in China's refrigeration and air conditioning industry to obtain both the "Carbon Footprint Assessment Certificate" and "Low Carbon Certification Certificate" for VRF conditioning products. To date, over 9 products have received "Carbon Footprint Assessment Certificates." Furthermore, Hisensehitachi will establish the industry's first product full life cycle carbon management platform, providing a smarter technical innovation path for enterprise energy conservation, emission reduction, and green development.



Hisensehitachi Product Carbon Footprint Assessment Certificate



## Application of Green Materials

Hisensehitachi actively fulfills corporate social responsibility, exploring the use of low-carbon, environmentally friendly, and renewable green materials at the product level, striving to minimize the environmental impact and carbon footprint of product materials while ensuring product performance.

In recent years, Hisensehitachi has continuously expanded the proportion of products using clean refrigerants, having initiated the work of replacing R410a refrigerant with R32 refrigerant in ATW products and unit machine products. We plan to use R32 refrigerant in all unit machines by 2025, and some regional air source heat pump products will begin replacing refrigerants with R290 from 2024 and complete the replacement by 2025, gradually phasing out high GWP value refrigerants to reduce impact on climate warming. Through continuous technological innovation and optimization, Hisensehitachi ensures its central air conditioning products operate efficiently while minimizing environmental load, setting a benchmark for green development in the industry.

In terms of packaging materials, Hisensehitachi actively explores green packaging solutions, adopting degradable and recyclable packaging materials to reduce the use of plastics and other non-degradable materials.

### Case | Gradual Replacement of Fin Aluminum Foil with Recycled Aluminum Materials

Hisensehitachi has gradually begun exploring the use of recycled materials in products. Taking the fin aluminum foil of fin-type heat exchanger products as an example, after completely replacing the heat exchanger fin hydrophilic aluminum foil base material with recycled aluminum materials, the aluminum material carbon emissions can be reduced from 11.2tCO<sub>2</sub>/t to 0.2tCO<sub>2</sub>/t.

Aluminum Carbon Emissions  
Can Be Reduced From  
11.2 tCO<sub>2</sub>/t  
↓ To  
0.2 tCO<sub>2</sub>/t



## Innovative Structure Design

Hisensehitachi actively explores product structure optimization, continuously challenging traditional design boundaries through precise engineering design and cutting-edge manufacturing processes, striving to achieve material use minimization and energy efficiency maximization while maintaining or even improving product performance. In terms of packaging structure, Hisensehitachi similarly pursues innovation and environmental protection, optimizing packaging design to not only reduce packaging costs but also improve the efficiency of product transport and storage, helping logistics suppliers reduce carbon emissions.

### Case | Designing Without Shaft Sleeves: Enhancing Efficiency and Reducing Carbon Footprint



Carbon Emissions from Raw Materials  
per Fan Unit Reduced by Approximately

10% ↓

Hisensehitachi initiated the "Research on Aluminum-Free Shaft Sleeve Axial Fan Using Modified PP Material for Side-Discharge Outdoor Units" project, exploring an entirely new reinforced connecting hub structure design that eliminates the use of fan aluminum alloy shaft sleeves, achieving approximately 10% reduction in raw material carbon emissions per fan.

When designing residential side-discharge VRV, Hisensehitachi actively explores low-carbon material applications while focusing on product structure design and optimization to improve product energy efficiency during use and reduce product carbon footprint. For example, optimizing the coupling efficiency between the air delivery system and heat exchanger ensures efficient and uniform air circulation, while equipped with high-performance large-displacement high-speed compressors and drive technology effectively improves operational efficiency and stability.



## Case | Green Packaging Transformation: Comprehensive Upgrade from Structure to Process

Hisensehitachi actively explores green packaging solutions, significantly improving packaging efficiency and reducing resource consumption and environmental impact through packaging structure innovation and process optimization.

## Packaging Structure Innovation



- Innovatively changed the built-in indoor unit packaging structure from all-paper packaging to a combination of buffer foam materials and paper packaging, effectively reducing resource consumption while maintaining product protection performance and improving packaging efficiency.
- Indoor unit small frame outer packaging material optimized through corrugated paper support structure, ensuring packaging strength while reducing resource consumption and environmental impact.

## Packaging Process Optimization



- For top-discharge and side-discharge products, using stretch film instead of traditional outer cartons, optimizing packaging process and improving packaging efficiency.



## Improving Product Energy Efficiency

Hisensehitachi has always been committed to addressing evolving social issues, consistently researching advanced technologies, continuously improving air conditioning products' energy utilization efficiency through technological innovation and optimized design, contributing to the vision of improving energy efficiency levels of national commercial and residential room air conditioners and other "key energy-consuming products and equipment."<sup>16</sup>

Product Type	Key Performance Data
 Room air conditioners, unit machines, duct machines	 National Grade-2 energy efficiency and above ratio approximately 50%
 Multi-connected air conditioning (heat pump) units	 National Grade-2 energy efficiency and above ratio approximately 98%
 Water source VRF	 National Grade-1 energy efficiency and above ratio 100%

## Central Air Conditioning Products

## Case |

Hisense Central Air Conditioning Positive Pressure Liquid Floating Oil-Free Variable Frequency Centrifugal Product, won the "Gold Award Product" honor at China Refrigeration Exhibition 2024

Hisense Central Air Conditioning's self-developed positive pressure liquid floating oil-free variable frequency centrifugal machine product successfully increased the centrifugal compressor isentropic compression efficiency to 91.6%. Combined with high-efficiency permanent magnet synchronous motor technology and other core technologies, this equipment can achieve a unit air conditioning coefficient of performance (COP) of 7.20, 14% higher than the national Grade-1 energy efficiency standard. Compared to traditional fixed-frequency centrifugal machine products, this Hisensehitachi product can save 222.93 million kWh of electricity per 1,000 units annually, equivalent to reducing 127,100 tons of carbon dioxide.



Hisense Central Air Conditioning Positive Pressure Liquid Floating Oil-Free Variable Frequency Centrifugal Product and Award

<sup>16</sup>Notice from the National Development and Reform Commission and other departments on the release of Advanced Efficiency, Energy Conservation, and Access Levels for Key Energy-Consuming Products and Equipment (2024 Edition)



## Promoting Industry Innovation

Hisensehitachi actively promotes industry green innovation, committed to setting an example in low-carbon and green development. Hisensehitachi invests substantial resources and technical strength in developing and optimizing low-carbon, energy-efficient cooling technologies. To date, Hisensehitachi's technological innovation has fully covered the entire industry chain, with the Company holding 2,155 central air conditioning and heat pump technology patents, of which 73 technologies are recognized by the industry as internationally leading or advanced, continuously driving central air conditioning industry technological transformation with advanced technology and winning widespread market recognition.

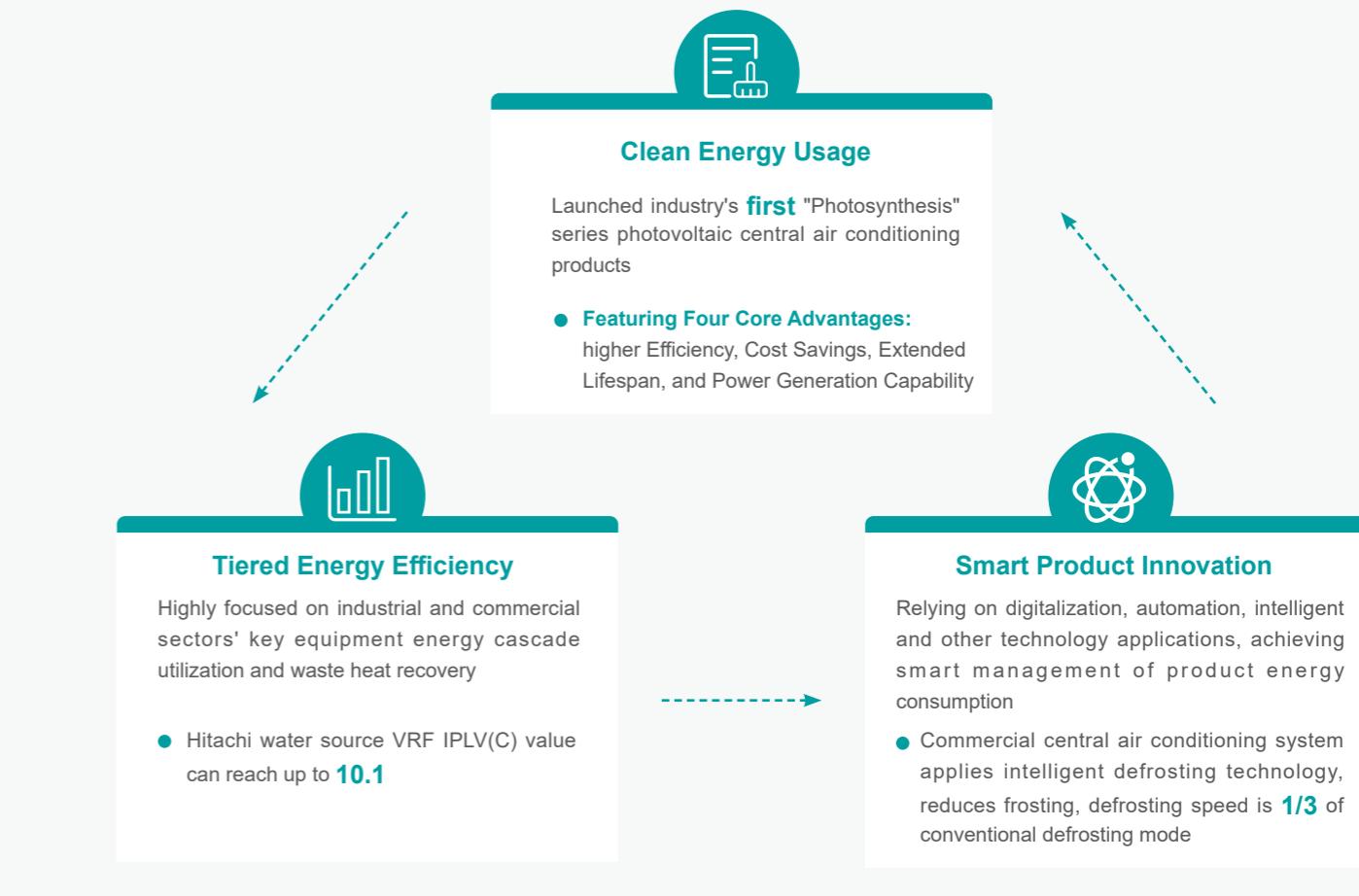
Hisensehitachi not only achieves green innovation in its own products and technologies but also actively participates in the development of low-carbon, green-related national standards, industry standards, and group standards. The Company works closely with government agencies, industry associations, and other enterprises, utilizing its technical experience and innovation achievements in green low-carbon areas to assist in developing and promoting environmental protection standards that meet international advanced levels. As of June 2024, Hisensehitachi has published 28 green, low-carbon related national, industry, and group standards, jointly promoting the industry towards a more low-carbon, environmentally friendly, and sustainable future.

### Low-carbon Related Standards Participated by Hisensehitachi

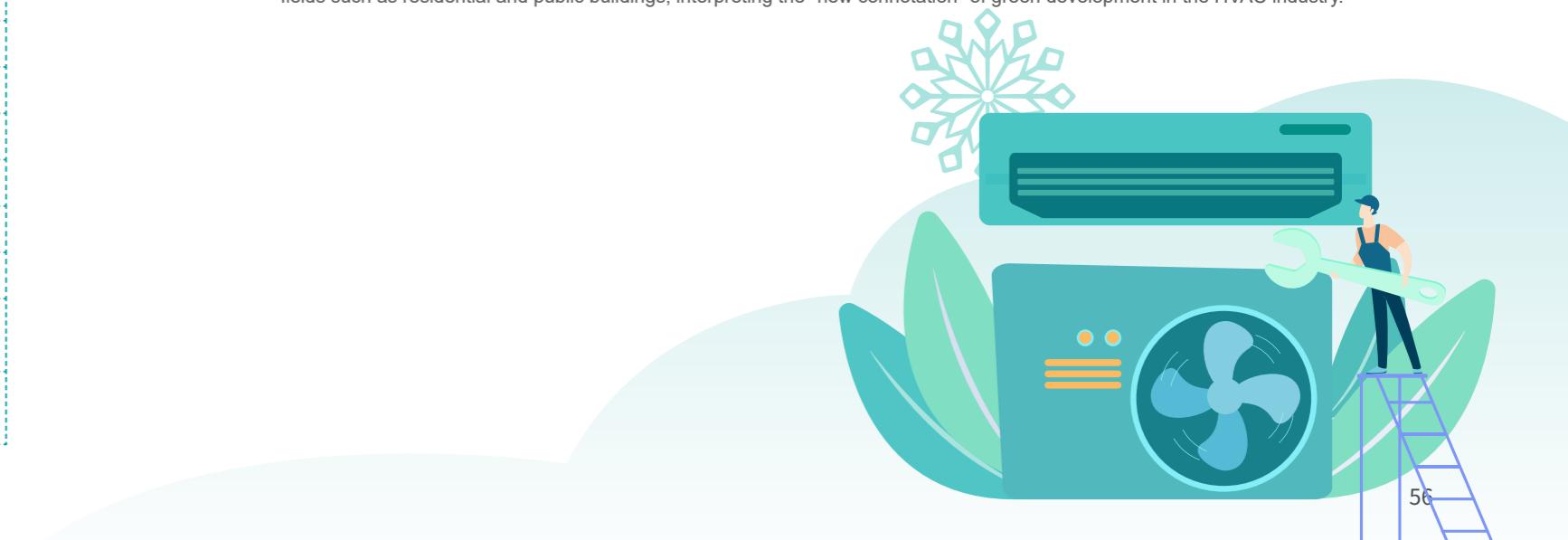
Standard Number	Standard Number
GB 19577-2024	Heat Pump and Water Chiller Unit Energy Efficiency Limits and Energy Efficiency Grades
GB 21454-2021	Multi-Connected Air Conditioning (Heat Pump) Unit Energy Efficiency Limits and Energy Efficiency Grades
GB/T 41660-2022	Energy Utilization Monitoring and Evaluation Methods for Refrigeration Test Equipment
JB/T 14568-2023	Green Design Product Evaluation Technical Specification Air Source Heat Pump Hot and Cold Water Units
JB/T 14569-2023	
JB/T 14572-2023	Green Design Product Evaluation Technical Specification Steam Compression Cycle Water Source Cold Water (Heat Pump) Units
NB/T 10777-2021	Commercial or Industrial and Similar Use Low Environmental Temperature Air Source Heat Pump Water Heater
NB/T 10779-2021	Air Source Heat Pump Central Heating Engineering Design Specification
NB/T 11240-2023	Air Source Heat Pump Drying System Energy Saving and Emission Reduction Calculation Method
CQC 5301-2019	Room Air Conditioner Green Product Certification Technical Specification
CQC53-439162-2019	Green Product Certification Implementation Rules Room Air Conditioners
T/CAQI 339-2023	Comprehensive Evaluation of Carbon Emissions in Civil Building Operation Phase
T/CAS 306-2018	Energy-Saving Technical Specification for Smart Home Appliances Based on Big Data Platform
T/CAS 487-2021	Agricultural Special Product Green Energy-Saving Drying Technology and Equipment Air Source Heat Pump Intensive Curing Room Tobacco Curing Technical Procedures
T/CAS 488-2021	Agricultural Special Product Green Energy-Saving Drying Technology and Equipment Air Source Heat Pump Intensive Curing Room

## Green Product Usage

### Achievements



Hisensehitachi has long been guided by green low-carbon principles, actively seizing industry green, digital and smart transformation development opportunities, continuously relying on industry-leading technology to launch "clean energy usage," "tiered energy efficiency," and "smart product innovation" green HVAC products, deeply integrating intelligent innovation with scenario needs in various fields such as residential and public buildings, interpreting the "new connotation" of green development in the HVAC industry.





## Clean Energy Products

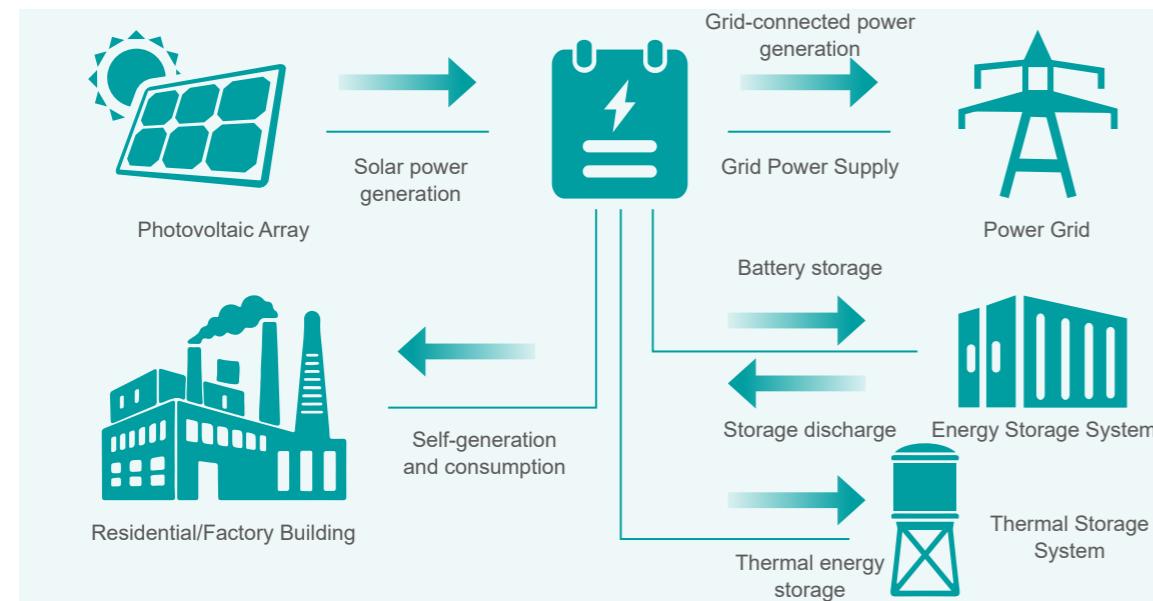
Research by the International Energy Agency (IEA) shows that heating and cooling account for about half of global energy consumption, and fully utilizing renewable energy is an important path for the HVAC industry to build a zero-carbon future<sup>17</sup>. To this end, Hisensehitachi continuously seeks breakthroughs and innovation, actively exploring feasible solutions for central air conditioning products to use renewable energy.

Compared to hydropower, wind power, nuclear power and other renewable energy categories, solar energy has significant characteristics of being clean, safe, and sustainable. Hisensehitachi deploys photovoltaic energy technology research and development, bringing "photovoltaic" and "central air conditioning" together, launching the industry's first "Photosynthesis" series photovoltaic central air conditioning products, providing users with more diversified and clean energy choices.



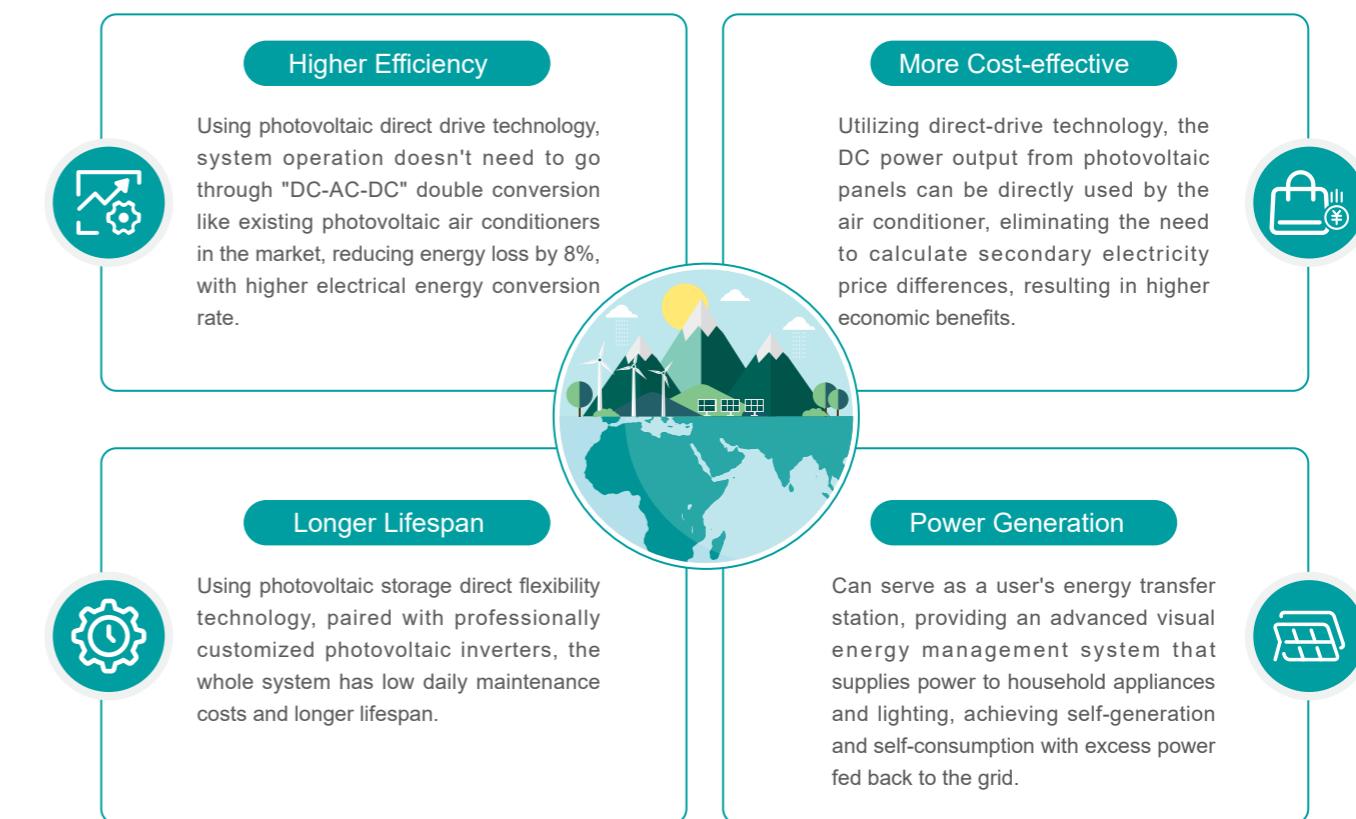
### Case | Hisense Central Air Conditioning "Photosynthesis" Series Products Help Hisense Again Selected for *Fortune* China ESG Impact List

Hisense Central Air Conditioning "Photosynthesis" series products are Hisense's craftsmanship in practicing green development, which also became an important consideration for Hisense to be selected again for *Fortune* China's ESG Impact List. *Fortune* pointed out that Hisense, taking advantage of the national opportunity to create "photovoltaic storage direct flexibility" buildings, uses advanced self-developed technology to create a photovoltaic storage direct flexibility variable frequency central air conditioning system, transforming air conditioning from a major power consumer to a distributed energy system transfer station, improving photovoltaic utilization while ensuring air conditioning operation stability, solving traditional air conditioning's high power consumption and high carbon emission problems, achieving technological innovation in the traditional air conditioning industry.



Hisense Central Air Conditioning "Photosynthesis" Series Products

Honor is recognition and also motivation. In the future, Hisense Central Air Conditioning will continue to explore green low-carbon development paths, continuously exploring product use of diversified renewable energy, with more possibilities for green development in the HVAC industry.



<sup>17</sup> International Energy Agency *Renewable Energy Policies in the Energy Transition Era - Heating and Cooling*



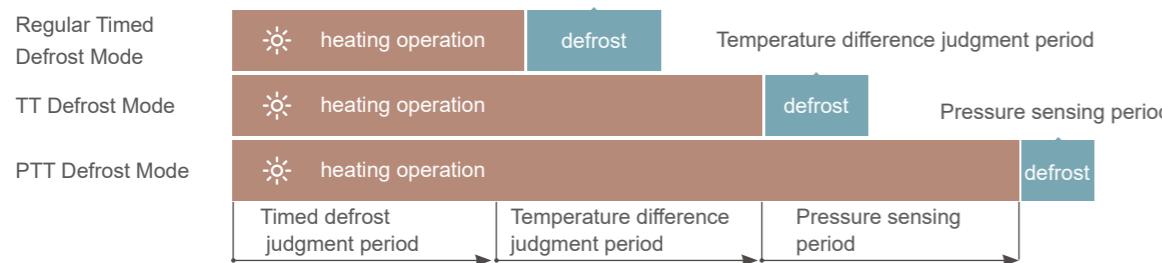
## Smart Energy Management

In the digital wave, AI, IoT and other technological transformations are creating huge development opportunities for enterprises. Hisensehitachi uses its own advantages, continuously promoting intelligent manufacturing, relying on digitalization, automation, intelligent and other technology applications, real-time monitoring product use phase energy consumption, achieving smart management of product energy use, achieving end-to-end collaborative low-carbon upgrade across research and development, process, use and other links.

### Central Air Conditioning Products

#### Case | Smart Defrosting, Ensuring Heating Performance in Winter

Hitachi's new generation CAM III commercial central air conditioning system through its advanced intelligent defrosting technology (PTT mode), optimizes winter heating efficiency. The system through precise analysis of sensor data, intelligent control of the defrosting process, reduces defrosting times, and through optimizing heat exchanger and refrigerant circulation, speeds up defrosting, reduces energy consumption. PTT defrosting mode adapts to multiple environments, can self-learn to improve defrosting efficiency. This technology not only improves user comfort, extends equipment life, but also contributes to reducing carbon emissions through reducing energy consumption.



### Retail Residential Solutions

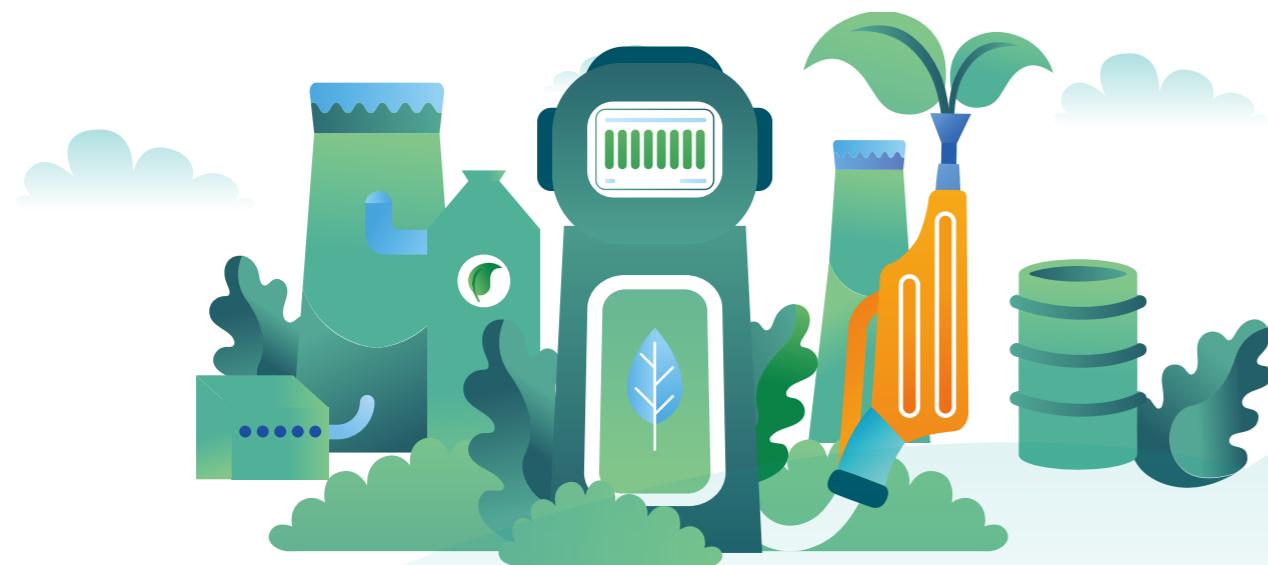
#### Case | Hisensehitachi Customized Air Solution for Whole Room 2.0 & Low-carbon Comprehensive Solutions

In November 2023, Hisensehitachi presents its All-House All-Sense system and low-carbon comprehensive solutions. at the 6th China International Import Expo.

The Customized Air Solution for Whole Room system also supports one-touch AI, dynamic optimal control. Based on the environmental temperature conditions detected by the system, referencing the user's city, meteorological bureau's outdoor air parameters, human comfort enthalpy-humidity interval and other dimensions, combined with the setting status of 300,000 indoor units on the Hitachi cloud platform for calculation, real-time dynamic parameter adjustment, without requiring users to set individually, ensuring user convenience while ensuring product energy consumption dynamic adjustment, avoiding energy waste.



Hisensehitachi Customized Air Solution for Whole Room 2.0 Smart Air Conditioning Customization System Operation Mode





## Comprehensive Energy Utilization

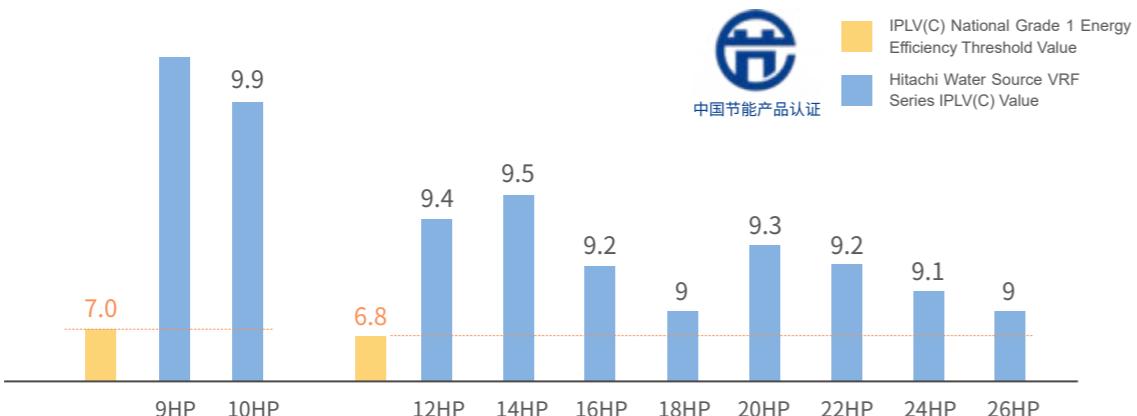
Hisensehitachi actively responds to national policy<sup>18</sup> calls, highly focusing on industrial and commercial sectors' key equipment energy cascade utilization and waste heat recovery, providing energy-saving, reliable green products to customers and consumers with innovative technology and superior performance, ensuring comprehensive and efficient use of resources, continuously contributing to enabling industry low-carbon development.

### Central Air Conditioning Products

#### Case | Hisensehitachi Water Source Variable Frequency VRF Helps Commercial Sector Achieve Double Heat Recovery in Refrigerant Side and Water Source Side

Hisensehitachi water source variable frequency VRF free cooling and heating type (heat recovery type) products, while inheriting Hitachi air conditioning products' high-end technology and environmental protection concepts, broke through the limitations of conventional air conditioning single operation mode.

Through adopting three-pipe heat recovery air conditioning technology and CH-Box conversion device, this product achieves simultaneous cooling and heating operation modes for different indoor units within the same system, recovering heat (cold) that needs to be discharged outdoors and transferring it to rooms requiring heating (cooling), with IPLV(C) value reaching up to 10.1, greatly improving overall energy efficiency while flexibly meeting users' personalized needs.



\*Taking Model 252 as an example, data was verified by the National Supervision and Testing Center for Compressor and Refrigeration Equipment Quality at Hefei General Mechanical and Electrical Products Testing Institute Co., Ltd.

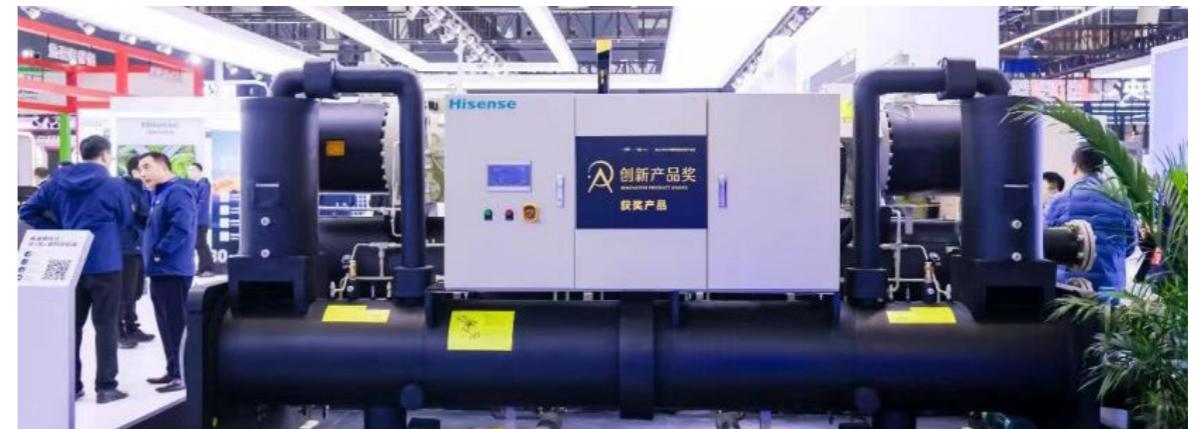
Hisensehitachi Water Source Variable Frequency Multi-Connected Central Air Conditioning Energy Efficiency Grade

### Heat Pump Products

#### Case | Hisensehitachi High-Temperature Screw Water Source Heat Pump Products Achieve Industrial Waste Heat Recovery and Reuse

At the 14th China Heat Pump Hot Water Heating Comfort Drying and Special Application Exhibition 2024, Hisensehitachi launched high-temperature screw water source heat pump unit products. These products can recover environmental heat energy and industrial waste heat for thermal energy production. Through this energy recovery and reuse, they can significantly reduce energy consumption and related carbon dioxide emissions.

The product's lowest water source discharge temperature can be as low as 12°C, able to fully utilize most heat source energy, reducing thermal pollution to the environment; the use side highest water outlet temperature can reach 85°C, able to meet high-temperature water demands for various places such as district heating, oil transportation, electroplating, printing and dyeing, chemical industry, drying, pharmaceutical, leather, agricultural and sideline products, farming, metal pre-treatment, slaughterhouses, etc.



Hisensehitachi High-Temperature Screw Water Source Heat Pump Products

<sup>18</sup>For example: National Development and Reform Commission's Opinion on Improving Systems, Mechanisms and Policy Measures for Green and Low-carbon Energy Transition states "Encourage emerging key energy-consuming sectors to primarily meet energy demands with green energy and fully utilize waste heat, pressure, and gas."



# Green End-of-Life Processing

## Achievements



### Establish "Modular" Concept



### Clean Energy Usage



Extend product lifespan, reduce product carbon footprint

As a responsible manufacturing enterprise, Hisensehitachi places high importance on reducing product carbon emissions in the end-of-life processing stage. Through implementing modular concepts and improving product recovery, we ensure our products can be efficiently and environmentally dismantled and recycled at the end of their service life.



## Modular Easy Dismantling

As time passes and equipment ages, users and consumers need to update, retire, and recycle central air conditioning products. How to efficiently dismantle products and reuse piping systems is a technical challenge facing the central air conditioning industry in achieving green recycling<sup>19</sup>. Hisensehitachi has introduced the "modular" concept from the initial product design stage, ensuring products are easy to dismantle and recycle, while improving product maintainability and upgradability and reducing carbon emissions from dismantling, disposal, and recycling.

<sup>19</sup>Central Air Conditioning Recycle: A Win-win Choice for Environmental Protection and Economy

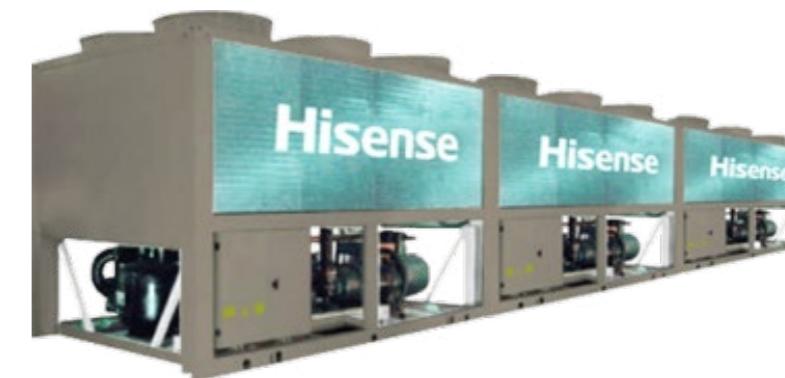


## Central Air Conditioning Products

### Case

### Hisensehitachi Screw Air-Cooled Chiller (Heat Pump) Product Adopts "Modular" Concept to Reduce End-of-Life Processing Emissions

Hisensehitachi screw air-cooled chiller (heat pump) unit adopts "modular" concept, through main unit can centrally control each module, achieving up to 4 units linked control, easily expanding installed capacity, each module independent from each other, failure of one module does not affect normal operation of other units, convenient for use, dismantling and recycling, able to easily meet air conditioning needs in different scenarios.



Hisensehitachi Screw Air-Cooled Chiller (Heat Pump) Unit

## Commercial Solutions

### Case | Fully Evaluate Equipment Status, Provide Optimized Low-carbon Renewal Solutions

With rapid technological development and continuous market launches of new products, machines used for over ten years face issues such as single functionality, outdated technology, inability for smart control, and poor experience. For this, Hisense Central Air Conditioning based on existing equipment status, using modular dismantling renewal technology, provides customers with low-carbon renewal solutions featuring short cycles, quick timing, good results, and low costs.



Hisense Central Air Conditioning Renewal Solutions



#### Solution I

Can update only indoor unit module or only outdoor unit module based on specific air conditioning status.



#### Solution II

Make full use of existing refrigerant piping modules while replacing both indoor and outdoor units.

# Green Solutions

## Achievements



### Personalized low-carbon comprehensive solutions, enabling enterprise green development

- Help data centers achieve waste heat recovery
- Enable farming industry low-carbon transformation development
- Create green medical environment solutions



### Create more open interconnected, low-carbon green spatial ecosystems

- Help municipalities achieve clean heating
- Help real estate industry achieve carbon reduction upgrade
- Support green rail transit development

### Enable residents to enjoy green living

- Promote green residential building development
- Create low-carbon comfortable living environments

Under the guidance of national "dual carbon" goals, Hisensehitachi has long implemented national green development concepts through practical actions, continuously conducting exploration around green low-carbon development, deeply integrating green technology with industry scenarios and needs applications, committed to providing low-carbon, efficient, comprehensive green solutions for municipal, enterprise and residential customers, continuously enabling multi-industry, multi-domain low-carbon energy-saving green high-quality development path with more wonderful explorations.



## Municipal · Low-carbon Green Building Leadership

Hisensehitachi leverages its innovative technology and excellent equipment advantages to develop comprehensive, low-carbon, green innovative solutions, creating more open interconnected and low-carbon green spatial ecosystems, providing strong support for government practice in low-carbon areas, helping governments achieve green building development and energy-saving goals, deeply promoting energy low-carbon transformation.

### Case

#### Hisensehitachi Waste Heat Recovery Clean Heating Solution, Using Sewage Waste Heat Recovery, Geothermal and Other Clean Energy to Help Municipalities Achieve Clean Heating

The National Development and Reform Commission's "14th Five-Year Circular Economy Development Plan" clearly identifies "promoting industrial waste pressure and heat, waste water waste gas waste liquid resource utilization, achieving green low-carbon circular development, actively promoting centralized gas supply and heating" as key tasks. In large-scale regional energy and centralized heating/cooling projects, Hisensehitachi fully leverages advanced technology and high-efficiency heat pump products' performance and advantages to ensure comprehensive and efficient resource utilization, achieving energy saving and emission reduction.



#### Hisensehitachi Heat Pump Solution for Yantai City Heat Power Co., Ltd. Taozhuang Sewage Source Heat Pump Central Heating Station Project

In phase one of the project, Hisensehitachi used 3 high-temperature centrifugal heat pumps with total installed heating capacity of 30 megawatts, providing centralized heating to surrounding 690,000 square meters of residential areas through sewage waste heat recovery. After both phase one and two projects are fully operational, it is expected that the heat extracted from sewage each heating season will be equivalent to the heat produced by burning 30,000 tons of standard coal or 23 million cubic meters of gas, equivalent to 75,000 tons of carbon dioxide emissions.



CO<sub>2</sub> Equivalent Emissions

7.5

Metric Tons



#### Hisensehitachi Beijing City Sub-Center Administrative Office Area Green Energy Supply System Construction Project

Hisensehitachi provided 4 York CYK dual-stage centrifugal high-temperature heat pump units (total installed heating capacity of 39 megawatts) for Beijing City Sub-Center No. 2 Energy Station, providing efficient centralized heating services to the administrative office area start-up zone through geothermal energy, helping Beijing City Sub-Center become a true green low-carbon ecological city demonstration zone. In a single heating season, the heat pump system can replace natural gas consumption of 12 million cubic meters, equivalent to 15,000 tons of standard coal, carbon dioxide emissions of 40,000 tons.

## Case | Hisensehitachi Low-carbon Building Service Solutions, Helping Real Estate Industry Carbon Reduction Upgrade

Buildings as basic material carriers for human production and living, energy consumption during building operation accounts for about 20% of total social energy consumption<sup>20</sup>. Hisensehitachi has always aimed to be "committed to becoming the most trusted partner in China's real estate industry," through integrating advanced air conditioning technology, intelligent control systems and renewable energy solutions and other technologies, significantly reducing energy consumption and carbon emissions in building operations, comprehensively achieving low-carbon building emissions.



Energy consumption during building operations accounts for approximately

**20%** of total societal  
energy consumption



## Hisensehitachi ECO-B Smart Building System

Based on ECO-B innovative technology & excellent equipment empowerment, Hisensehitachi uses Internet of Things, big data, artificial intelligence, 5G and other new generation information technologies to provide all-space, all-scenario, full-lifecycle one-stop smart building solutions, making buildings more low-carbon and environmentally friendly, creating more open interconnected spatial ecosystems, bringing users more efficient & comfortable experiences, as well as customized services.



Hisensehitachi ECO-B Smart Building System



## Hisensehitachi Near-Zero Energy Building Air Conditioning Solutions

Hisensehitachi designed and developed small VRF systems, satisfying heating and cooling needs of various spaces within buildings with its efficient, stable performance. Meanwhile, paired with high-efficiency PHI total heat new air units, the system can maintain stable indoor temperature while achieving efficient energy recovery and fresh air ventilation, significantly improving living environment comfort and energy-saving effects, greatly reducing building energy consumption, setting an example for future green buildings



Hisensehitachi Near-Zero Energy Building Air Conditioning Solutions Launch Event

## Case | Hisensehitachi Helps Green Rail Transit Development

At Qingdao Metro Line 1 Wawuzhuang Parking Lot Complex Building, Hisense Central Air Conditioning cleverly utilized subway undersea tunnel seepage seawater source heat pump technology, providing green renewable heating and cooling solutions. Through magnetic levitation variable frequency centrifugal water chillers and magnetic levitation variable frequency centrifugal heat pump units, combined with ECO-Building smart building system, Hisense not only successfully built a seawater energy pool but also achieved an efficient, low-carbon heating and cooling system.

The implementation of this innovative solution significantly improved energy efficiency, reduced energy consumption, and through intelligent group control system achieved centralized control and optimized management of equipment, effectively reducing operation and maintenance costs. Compared with traditional systems, this project is expected to save 30% energy annually, save 92.2 tons of standard coal, and significantly reduce CO<sub>2</sub>, SO<sub>2</sub> and dust emissions. Hisense's intelligent group control system, with its openness and compatibility, supports multiple standardized communication protocols, can seamlessly access multiple system type equipment including host machines, chilled water pumps, cooling water pumps, cooling towers, effectively solving the industry pain point of HVAC field group control system communication protocol differences. The Qingdao Metro equipment room control system is equipped with a 15-inch industrial control touch screen monitoring interface, not only achieving real-time monitoring and remote control of equipment but also greatly improving operation and maintenance efficiency, achieving smart operation.



HAI-ECS Intelligent Group Control System





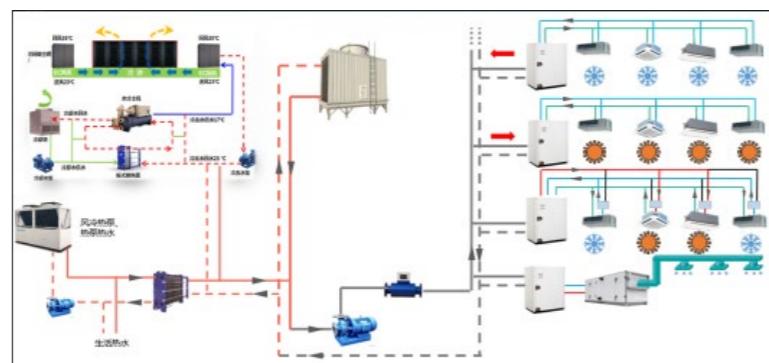
## Enterprise · Low-carbon Efficiency Upgrade

With excellent performance and flexible innovation capabilities, Hisensehitachi provides personalized low-carbon comprehensive solutions for enterprise clients across different industries through energy-efficient design and intelligent control systems, achieving optimization of enterprise energy use, reducing operating costs, helping enterprises achieve low-carbon development goals.

### Case | Hisensehitachi Water Source VRF Solution, Helping Data Centers Achieve Waste Heat Recovery and Reuse

Hisensehitachi developed and designed data center waste heat utilization service solutions for 10 data center building rooms and other buildings of a securities exchange. Through water source variable frequency VRF system, the project fully utilizes the characteristics of data centers' year-round stable heat dissipation and central air conditioning system's chilled

return water heat, achieving waste heat recovery and reuse. In summer, through accessing the cooling water system for air conditioning cooling, it effectively reduces the chiller unit's operating load, improves water source host efficiency, achieving energy-saving and consumption reduction goals, significantly improving data center energy utilization efficiency, helping enterprise-level clients actively respond to the national call for building green low-carbon data centers<sup>21</sup>.

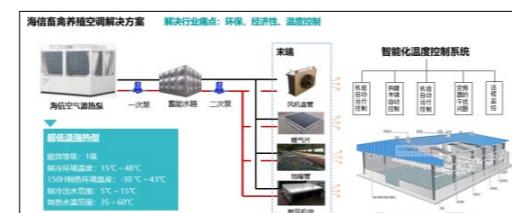


Hisensehitachi Water Source VRF Solution

### Case | Hisensehitachi Livestock and Poultry Farming Air Conditioning Solutions, Enabling Farming Industry Low-carbon Transformation Development

China is currently the world's largest livestock and poultry farming country, providing about 1/3 of global livestock and poultry meat production. From free-range farming, to greenhouse farming, to current modern industrial farming, scale farming has developed rapidly, with green farming becoming prevalent.

Hisensehitachi developed air source heat pump technology and intelligent temperature control systems, providing innovative air conditioning solutions for the livestock and poultry farming industry. This solution effectively solves temperature control challenges in farming environments through intelligent precise temperature control equipment, ensuring healthy growth of livestock and poultry, while significantly reducing energy consumption and operating costs, improving economic benefits. Meanwhile, Hisense's solution focuses on environmental protection, reducing carbon emissions through high-efficiency energy-saving technology, helping the farming industry achieve green low-carbon development.



Hisensehitachi Livestock and Poultry Farming Air Conditioning Solutions

### Case | Hisensehitachi Green Medical Environment Solutions

Hisensehitachi provided comprehensive green air conditioning environment solutions for the Phase II expansion project of Shandong University Qilu Hospital (Qingdao), aiming to create a superior medical environment for patients.

#### Precise HVAC Design:

Hisensehitachi precisely calculated outdoor parameters such as atmospheric pressure and temperature based on Qingdao's climate characteristics, ensuring indoor environment comfort. Meanwhile, detailed temperature, humidity, and air velocity design was conducted for special needs of different hospital areas, such as consultation rooms and wards.

#### Green Low-carbon Energy Solution:

In energy system design, Hisensehitachi adopted renewable energy technologies such as ground source heat pumps and solar energy, combined with efficient traditional equipment, to reduce energy consumption and carbon emissions.

#### Automation Control Technology:

Through building automation control system, Hisensehitachi achieved intelligent monitoring and adjustment of the air conditioning system, improving hospital environment stability and comfort while reducing operating costs and enhancing management efficiency.

#### Customized Environmental Solutions:

For hospital critical areas such as surgery areas and ICUs, Hisensehitachi provided customized air conditioning system design, ensuring year-round stable environment in these areas, meeting strict medical standards.

#### Customized Environmental Solutions:

In equipment selection, Hisensehitachi focused on energy efficiency and environmental performance, choosing equipment with high energy efficiency ratios, stable operation, and low maintenance costs, aiming to reduce hospital operating expenses while reducing environmental impact.

In the future, Hisensehitachi will continue to drive technological progress through innovation, enable industry smart development, create leading, high-quality, intelligent solutions, contributing more strength to the green, high-quality development of the medical industry.

<sup>21</sup>Guiding Opinions on Strengthening Green Data Center Construction by the Ministry of Industry and Information Technology, National Government Offices Administration, and National Energy Administration"states "Encourage the construction of clean energy utilization systems such as natural cooling sources, waste heat recovery from own systems, or renewable energy power generation in owned premises"



## Residential · Low-carbon Comfortable Living

For the residential market, Hisensehitachi's residential central air conditioning products focus on environmental protection and health, bringing comfortable, green living environments to household users through energy-efficient design.

### Case | Hisense Central Air Conditioning Green Cooling and Heating System Protects Changde Smart Valley Innovation Center, Promoting Green Residential Building Development

Hisensehitachi provided green solution services for Changde Smart Valley Innovation Center. In this project, two screw water-cooled chillers and high-efficiency VRF work together, "each performing their duties" for differentiated application scenarios, while partnering with energy-saving hot water units to solve hot water issues, three major products jointly creating a modern green building.



#### Screw Water-cooled Chiller

This unit adopts R134a refrigerant-specific twin-screw compressor, ensuring long-term stable operation, reducing failure rate. Its high-sensitivity NTC sensor can control temperature accurately to 0.1 °C, paired with double-cast shell, effectively reducing noise, improving user comfort experience.



#### High-efficiency VRF

Provides flexible and efficient cooling and heating solutions, ensuring comfort in office and living environments.



#### Energy-saving Hot Water Unit

Meets the project's hot water needs, creating comprehensive comfort experience.



Changde Smart Valley Innovation Center

### Case | Hisensehitachi Customized Air Solution for Whole Room Provides Low-carbon, Comfortable Living Environment for Consumers

Hisensehitachi "Customized Air Solution for Whole Room" achieves power adaptation through intelligent means, significantly reducing product carbon emissions during use. Under Hitachi "Customized Air Solution for Whole Room" mode, the fresh air dehumidification heat recovery all-in-one machine can optionally be configured with central humidification module, performing humidification and dehumidification functions while introducing fresh air. Built-in compressor independent heat pump system easily handles special season dehumidification needs like returning south weather and plum rain season, achieving whole house humidity adjustment. Low-temperature automatic dehumidification machine, 1% precise adjustment, adjustable humidity range 35%-90%. Overall design aligns with natural environmental protection theme and humanistic ecological perspective, energy-saving and low consumption operation, helping achieve low-carbon environmental protection goals, providing users with green, comfortable living environment.



Hisensehitachi "All-House All-Sense Air Customization System"



# Leading

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## Embracing Low-carbon Direction, Setting Industry Benchmarks

According to statistics, greenhouse gas emissions from the refrigeration sector account for about 7% of global total emissions, while the agricultural sector accounts for one-third, therefore, promoting green low-carbon development in the refrigeration and agricultural sectors plays a key role in mitigating climate change. To address this challenge, the country has successively introduced relevant policies aimed at promoting clean transformation of refrigerants and strengthening energy conservation and carbon reduction work in rural areas. As a pioneer and leader in low-carbon development, Hisensehitachi closely follows policy trends, strengthens lifecycle management of refrigerants, develops "Clean Refrigerant Closed-Loop Management Model," committed to building clean refrigerant ecosystem circle with partners; meanwhile actively launching "Rural Revitalization Green Low-carbon Comprehensive Solutions" to enable rural green low-carbon development.

Promoting · Refrigerant Green Transformation

75

Benefit · Low-carbon Rural Revitalization

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## Promoting · Refrigerant Green Transformation

Refrigerants, as one of the important sources of greenhouse gases, have a significant impact on global warming. Greenhouse gas emissions from the refrigeration sector account for about 7% of global total emissions, projected to increase to 4.4-6.1 billion tons CO<sub>2</sub> equivalent by 2050, accounting for over 10%<sup>22</sup> of that year's projected global emissions. The United Nations Environment Programme (UNEP) and International Energy Agency (IEA) report<sup>23</sup> points out: if globally coordinated action is taken to promote energy-efficient and climate-friendly cooling transformation, over 460 billion tons of greenhouse gas emissions will be avoided in the next 40 years. To effectively mitigate climate change, international and Chinese governments have successively introduced corresponding policies, promoting rapid upgrade of refrigerant technology and widespread application of clean refrigerants through implementing refrigerant quota system and increasing terminal GWP value limits.



<sup>22</sup>Global Cooling Watch from the 28th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP28): Greenhouse gas emissions from the cooling sector account for about 7% of global total emissions, and are expected to increase to 4.4-6.1 billion tonnes of CO<sub>2</sub> equivalent by 2050, accounting for over 10% of projected global emissions that year.

<sup>23</sup>United Nations Environment Programme (UNEP) and International Energy Agency (IEA) Comprehensive Report on Cooling System Emissions and Policies

Hisensehitachi has long been deeply involved in refrigerant clean transformation field, deeply understanding that innovation and development of clean refrigerants cannot be separated from extensive cooperation and exchange. Therefore, Hisensehitachi actively establishes close cooperative relationships with research institutions, universities and industry partners, jointly promoting clean refrigerant innovation research and development and application through technical cooperation and standard setting, accelerating industry transformation towards low-carbon environmental protection direction. Additionally, to achieve comprehensive green control of refrigerant use, the Company independently developed a "Clean Refrigerant Closed-Loop Management Model" covering refrigerant lifecycle links including "research and development design," "production manufacturing," "user use," "recovery processing," "end disposal."

### Hisensehitachi's Closed-Loop Management Model for Clean Refrigerant



#### R&D and Design

##### Leading Clean Refrigerant Technology Innovation:

Partner with upstream suppliers, promote environmental refrigerant R&D and application



#### Production & Manufacturing

##### Full Process Escape Control:

Investigate refrigerant escape sources, propose targeted improvement measures, promote production manufacturing end refrigerant escape reduction around following five key directions:

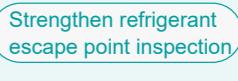
Strengthen refrigerant escape data

Strengthen refrigerant storage and inventory weighing management

Establish information management system

Added refrigerant management module to CMS and Established IoT-based refrigerant information management and control system

Upgrade injection gun head



Conduct regular pipeline leak detection and maintenance work

Improve refrigerant recovery ratio

Enhance refrigerant recovery procedures and management processes for equipment decommissioning, pipeline maintenance, and tank depressurization



#### User Use

##### Build Comprehensive User Service System:

Provide professional installation and maintenance services, reduce installation link refrigerant leakage risk

##### Products Equipped with Smart Monitoring Module:

Achieve real-time monitoring and smart warning of refrigerant remaining amount, improve user experience while promoting resource efficient use



#### Recovery Processing

##### Establish Comprehensively Covered Refrigerant Recovery Network:

Innovate recovery mode, provide convenient efficient door-to-door recovery service, guide users to actively participate in refrigerant recovery, promote resource circular use



#### End-of-life Disposal

##### Ensure Directional, Professional Treatment of Refrigerants in Scrapped Products:

Establish long-term cooperation relationship with dismantling disposal suppliers, achieve green closed-loop management of refrigerant full lifecycle from production to disposal, setting new benchmark for industry environmental protection and sustainable development

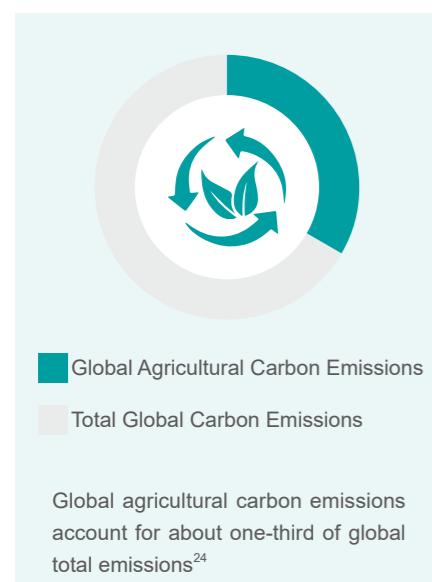
In the future, Hisensehitachi will uphold an open-sharing spirit, actively sharing the essence of "Clean Refrigerant Closed-Loop Management Model" with industry peers. Through organizing seminars, technical exchange meetings and other forms, promote deep exchange and cooperation among industry colleagues, join hands with industry partners to build clean refrigerant ecosystem circle.



## Benefit · Low-carbon Rural Revitalization

In exploring global climate governance and sustainable development paths, Hisensehitachi deeply understands that rural areas, as core zones of agricultural production, their carbon reduction actions have immeasurable value for achieving whole society carbon reduction goals. We firmly believe that through dual-drive of technological innovation and model innovation, we can deeply empower rural economy, opening a new chapter of green low-carbon rural revitalization. To this end, Hisensehitachi launched "Rural Revitalization Green Low-carbon Comprehensive Solutions," aiming to precisely connect cutting-edge technology and quality service with rural development needs, injecting strong power into rural green transformation.

### Global Agricultural Carbon Emissions Status



### China's Rural Revitalization Policies

#### Opinions on Doing Well in Key Work of Comprehensively Promoting Rural Revitalization in 2022



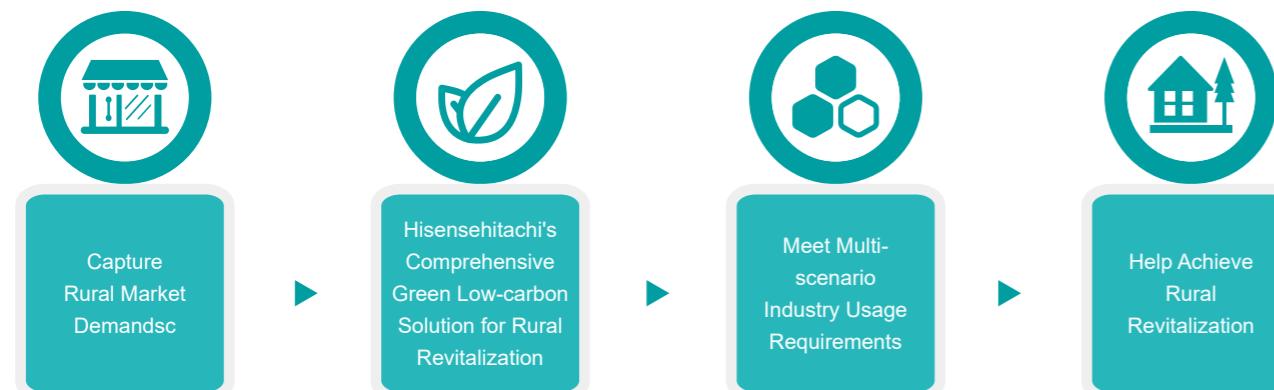
#### Rural Construction Action Implementation Plan



Country highly values energy conservation and carbon reduction potential in rural areas, emphasizes importance of promoting clean energy in rural areas

Hisensehitachi "Rural Revitalization Green Low-carbon Comprehensive Solutions" comprehensively covers multiple dimensions including low-carbon farming and planting, photovoltaic central air conditioning, low-carbon agricultural product processing factories, low-carbon clean heating, low-carbon drying, low-carbon township construction, precisely connecting multiple scenario usage needs under national rural revitalization strategy such as agricultural production, agricultural product processing, rural commercial construction, user heating. The transformation from urban low-carbon to rural low-carbon not only helps promote sustainable development in rural areas but also brings new market opportunities for the HVAC industry. Hisensehitachi will continue to precisely dig into market and user demand pain points, launch more efficient low-carbon environmental protection solutions, leading HVAC industry expansion into rural markets.

### Hisensehitachi's Pathway to Supporting Rural Revitalization



<sup>24</sup>UN Official Website Food Systems Account for Over One-Third of Global Greenhouse Gas Emissions

### Case

## Rural Revitalization New Engine: Low-carbon Agricultural Product Processing Technology Solutions Lead Green Development



### Exploring Rural Market Demands

"Accelerating construction of agricultural product storage preservation cold chain facilities is beneficial for consolidating agricultural material foundation equipment, reducing agricultural product post-harvest losses, improving agricultural product added value and premium capability, promoting stable farmer income increase; beneficial for improving agricultural product quality, meeting agricultural product consumption diversification, quality demands, making agricultural brands bigger and stronger."<sup>25</sup>

• In 2020 National Ministry of Agriculture and Rural Affairs issued implementation opinions on accelerating agricultural product storage preservation cold chain facility construction exploring rural market demands.

• In 2023 country again issued notice on continuing to do well in agricultural product origin cold storage preservation facility construction work, and made "improving origin cold storage preservation facility network" as key construction task.

Under national policy guidance, Hisensehitachi deeply explored rural market demands, realizing importance of improving agricultural product storage quality and extending preservation period for promoting rural economic development and increasing farmer income, meanwhile discovering rural market's growing demand for green low-carbon, high-efficiency energy-saving agricultural product cold storage preservation solutions. Taking food preservation cold storage as example, rural areas need cold storage with library temperature 15~18°C, temperature freely adjustable, centrally controllable management.

### Creating Rural Revitalization Green Low-carbon Comprehensive Solutions

Focusing on agricultural product cold storage preservation needs, Hisensehitachi launched green low-carbon comprehensive solutions, with technology as core, energy saving and consumption reduction as starting point, improving rural cold storage system's intelligence level, leading agricultural green development transformation

Taking Hisense's provided 80HP parallel screw compressor unit as example, this refrigeration system paired with high-efficiency strong wind type air cooler not only operates stably with low noise, but also can quickly reduce temperature and enhance defrosting effect, achieving library temperature uniformity, thereby achieving energy saving and emission reduction goals. Additionally, introduction of fully automatic temperature control system can achieve automatic adjustment of in-library temperature, temperature and humidity alarm, data recording, and mobile client monitoring and other functions, improving management efficiency and product traceability.



<sup>25</sup>Implementation Guidelines from the Ministry of Agriculture and Rural Affairs on Accelerating the Construction of Agricultural Product Storage, Preservation and Cold Chain Facilities

## Conclusion

In the journey of addressing global climate change, the HVAC industry is experiencing profound transformation and reshaping. As an industry pioneer, Hisensehitachi has actively engaged in this green revolution and achieved significant results. We take "green operation management" as foundation, improving low-carbon management system, cultivating green office culture, laying solid foundation for enterprise green transformation; in "green production manufacturing" field, we construct four-level emission reduction path "implementing energy-saving technical transformation, innovating digital smart integration, optimizing energy structure, screening negative carbon technology," continuously reducing production link carbon emissions; meanwhile, we view "smoothing green supply chain" as key grip, committed to jointly promoting green transformation with partners; in "green products and solutions" innovation research and development, we continuously make breakthrough, driving industry towards more green, efficient, sustainable direction with technological innovation.

Looking to the future, Hisensehitachi will continue to uphold innovation-led, green development concepts, continuously increase R&D investment in low-carbon technology, clean energy and intelligent control and other aspects continuously explore and apply new technologies, new materials, with more environmental protection, efficient products and services, meeting market's growing demand for green HVAC solutions. Meanwhile, we will deepen exchange cooperation with domestic and international partners, jointly explore new opportunities under carbon neutrality path, join hands to promote HVAC industry's green transformation and sustainable development.



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