How Commercial Real Estate Can Leverage Energy Audits to Enhance Operational Efficiency and Benefits

2026.06.

1 About Our Commercial Buildings

Guangzhou Yuexiu Commercial Real Estate Management Co. LTD

URBAN COMPREHENSIVE INVESTMENT OPERATION
城市综合投资运营

Gross Leasable Area
7.3 million ㎡

National Commercial Real Estate Ranking
TOP 13

Total Asset Scale
109 billion yuan

Asset Growth
15 times
(since2005)

Reduce operating costs

Enhance customer experience

Support sustainable development

Boost brand value

2 Sustainable Development Goals

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- Energy conservation is a core component of the environmental benefits covered in ESG reports.
- Energy-Saving Renovation Goals: **Enhance Brand Value** & **Boost Asset Value**

ESG Reports

Social
社会责任

- Safe Operation
- Talent Management
- Harmonious Community
- Low-Carbon Public Welfare

Environmental
环境效益

- Emissions Management
- Biodiversity Conservation
- Eco-friendly Materials

Energy conservation and emission reduction.

- Quantitative Energy-Saving Targets
- Energy-Saving Technology Framework
- (GHG) Emission Reduction
- Renewable Energy Utilization

Governance
公司管治

- Corporate Vision
- Tenant Charter
- Supply Chain Management
- Integrity and Compliance
- Green Finance

Enhance Brand Value

Improve the company's ESG ratings

Secure green certifications

Boost Asset Value

Reduce operating costs

lower financing costs

3 Targets and Pressures For Energy Conservation and Emission Reduction

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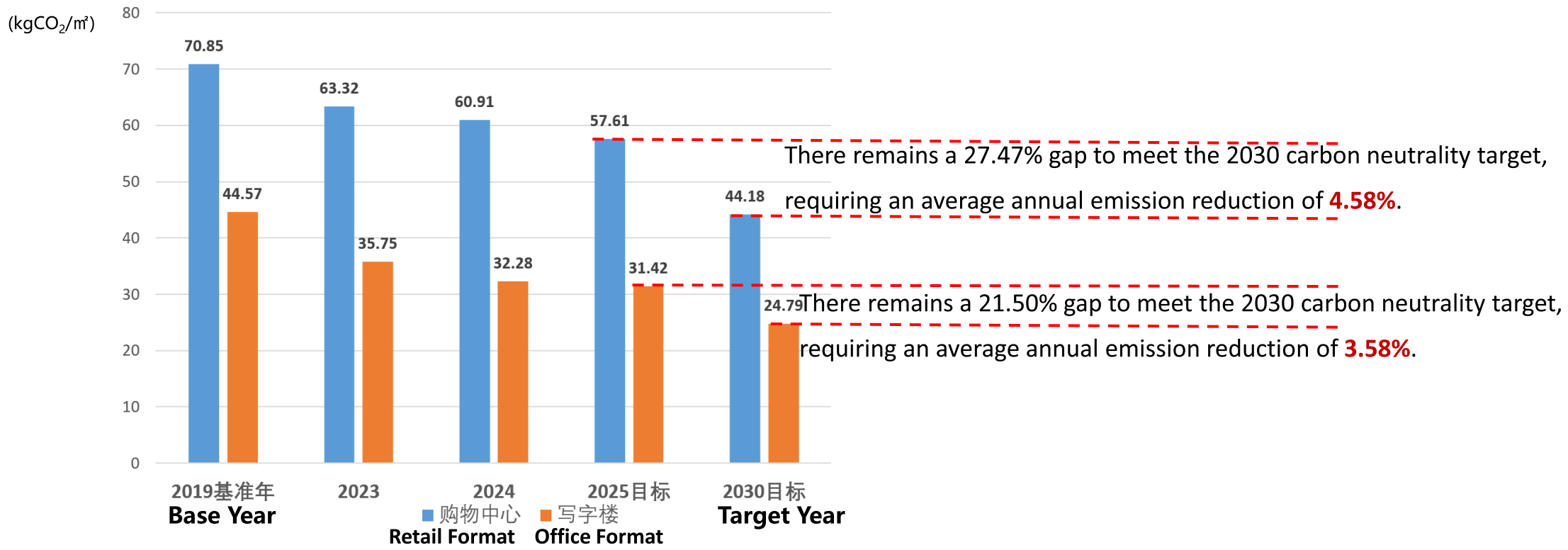
- Yuexiu Property has announced its 2030 carbon neutrality target, with quantified requirements set for energy conservation and emission reduction of its commercial and office projects:
- For the **retail format**: Carbon emissions will decrease from 70.85 $kgCO_2/m^2$ in the base year to 44.18 $kgCO_2/m^2$ in the target year, representing an average annual reduction of **4.58%;**
- For the **office format**: Carbon emissions will decrease from 44.57 $kgCO_2/m^2$ in the base year to 24.79 $kgCO_2/m^2$ in the target year, representing an average annual reduction of **3.58%.**

Data source: *Yuexiu Commercial Management Carbon Inventory Analysis Report (Scope 1 and Scope 2)*



4 Energy Audit and Carbon Inventory

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1 **Investigation Preparation**

Literature Review
Standard
Investigation Plan and Work Scheme
Communication

2 **Document and Data Collection**

Collect building information：
Building drawings
Building energy consumption data
Building equipment information

3 **On-Site Investigation**

Document and Data Verification
Discussion on Project Operation Status
On-Site Inspection of Energy-Consuming Systems
Measurement of Indoor Environmental Parameters

4 **Data Processing**

Compile and organize all collected information and the application status of energy-saving technologies.
Calculate the energy consumption and carbon emission data for each project.

Preliminary Investigation

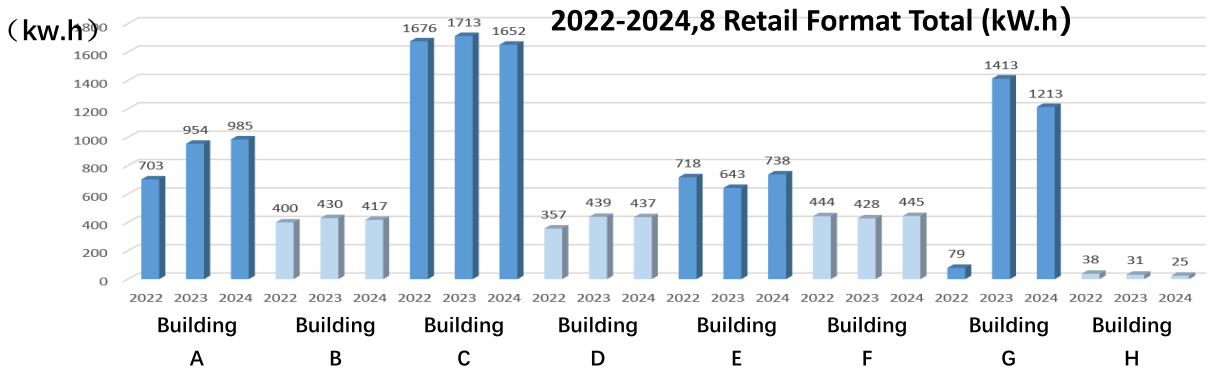
Data Form Collection，
Property Management Interviews

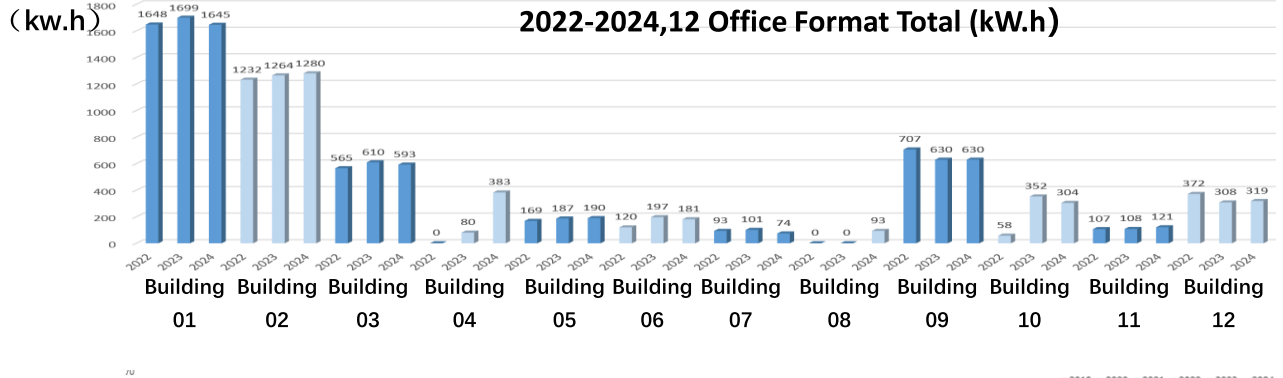
In-Depth Investigation

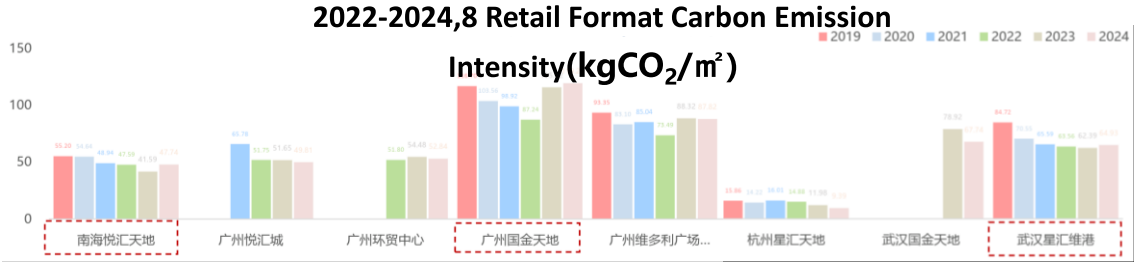
On-Site Measurement，
System Performance Testing，
Energy Efficiency Assessment，
Energy Efficiency Improvement Recommendations

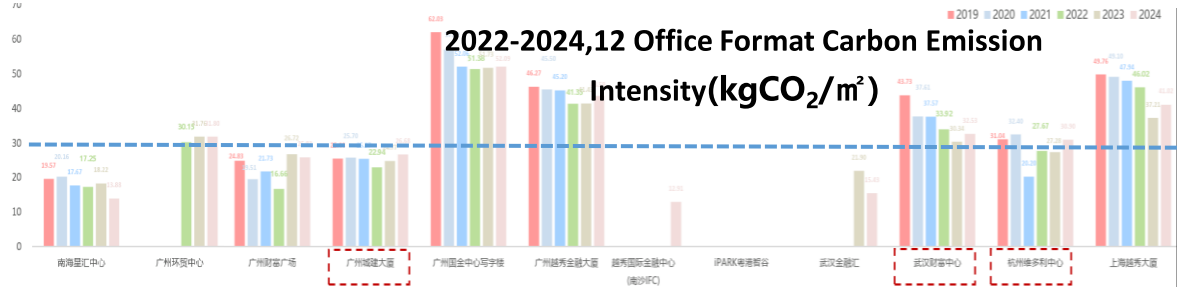
5 Energy Audit Results

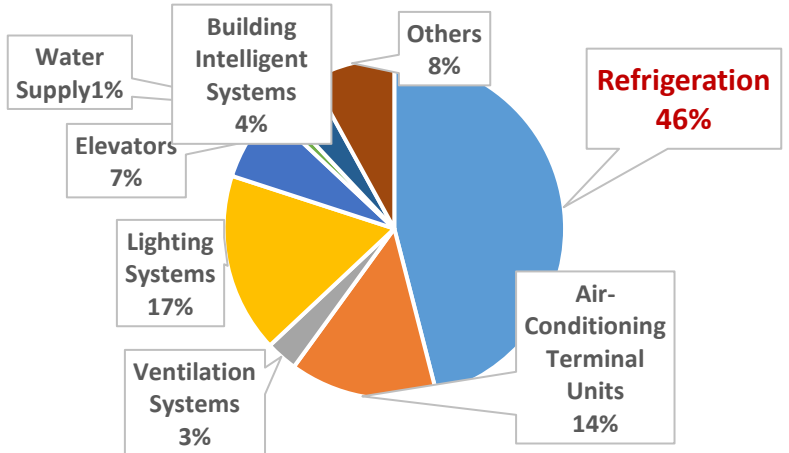
- There are significant differences in both the overall energy consumption and the per-unit-area energy consumption across projects
- **Refrigeration** energy consumption of air-conditioning systems accounts for the largest share of total energy consumption.

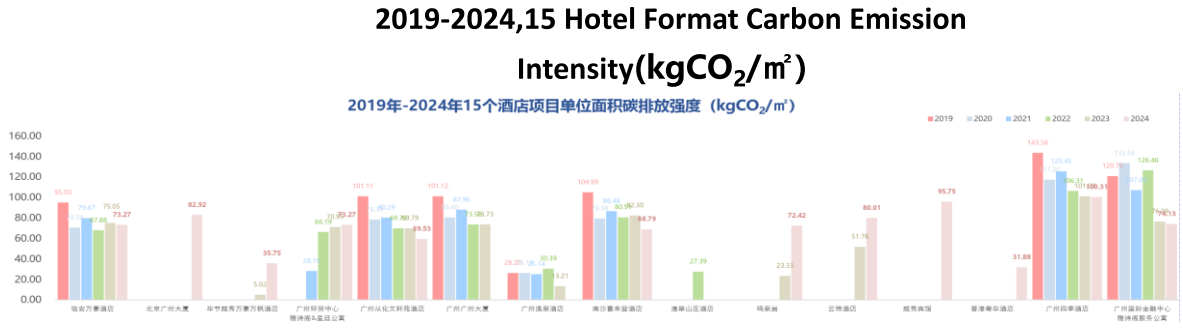












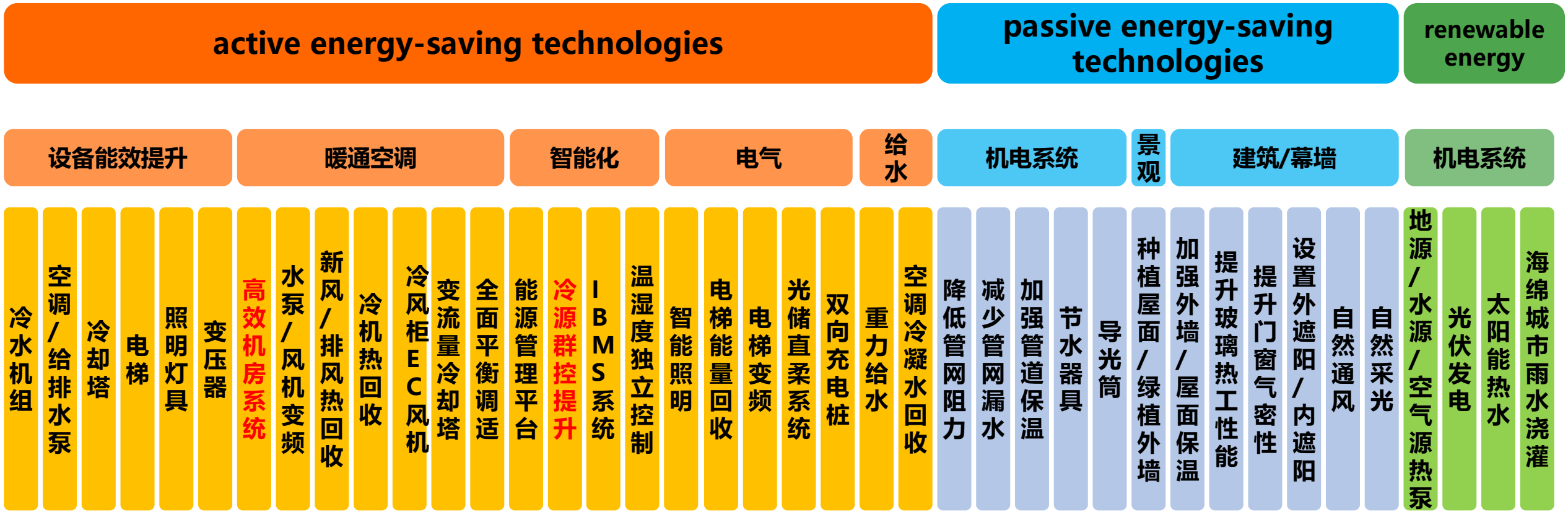
6 From Problems to Solutions

	Pain Points	Solutions
Basic Status	Incomplete Energy Data	**Energy Audit**
	Lack of Clear Energy-Saving Targets	Quantified Energy-Saving Targets
	Automatic Control System Malfunction	Upgrade Automatic Control Systems
	Lack of Professional System Commissioning	Engage Professional Commissioning Consultants
	System Aging and Obsolescence	Equipment Full Life Cycle Analysis
Operation and Maintenance	Excessive Operation	Operation and Maintenance (O&M) Optimization
	Excessive Outdoor Air Intake	
	Excessively Low Indoor Temperature	
Design	Lack of Shading for Skylights	Install Shading Systems
	Poor Heat Dissipation Performance	Adjust Equipment Installation Position
	Excessive Design Redundancy	Update Design Guidelines
	Lack of VFD Control	Add VFD Control
Construction	Lack of Professional System Commissioning	Engage Professional Commissioning Consultants
	Installation Errors	Upgrade Automatic Control Systems
	Lack of Regular Equipment Calibration	
Equipment	Substandard Equipment Efficiency	Equipment Rectification
	Control Valve Malfunction	Equipment Maintenance and Renewal

Energy Efficiency Technology Framework

7 Energy Efficiency Technology Framework

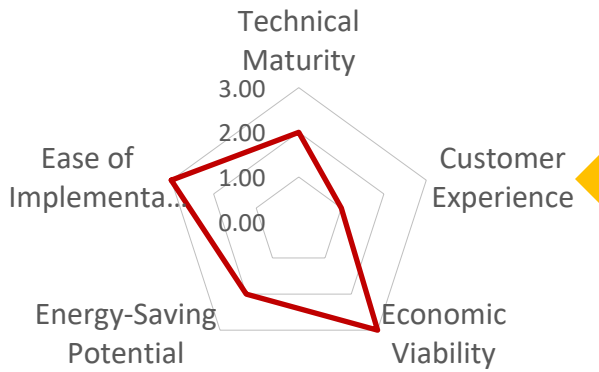
- The system comprises three categories: **active energy-saving technologies**, **passive energy-saving technologies**, and **renewable energy**.
- These are further divided into 9 modules, covering a total of 40 technologies



8 Selection of Energy-Saving Technologies

- Energy-saving technologies are selected based on a scoring system across four dimensions: **Technical Maturity, Economic Viability, Energy-Saving Potential, Customer Experience, Ease of Implementation**

Taking Variable Frequency Drive (VFD) technology as an example



Energy-Saving Technology Score Comparison

Energy Efficiency Technology Framework	Technologies	Technical Maturity	Customer Experience	Economic Viability	Energy-Saving Potential	Ease of Implementation	Total
Equipment Status	Air-Conditioning Water Treatment for Scaling Reduction Cooling Tower Fill Replacement Fan Belt Tensioning	★★★	-	★★	★★★	★	9★
System Transmission and Distribution	**Fans and Pumps add VFD Control**	★★	-	★★	★★	★★★	9★
	Hydronic and Air System Balancing and Adjustment	★★	★	★★	★	★	7★
Building Automation System (BAS)	Upgrade Automatic Control Logic	★★★	-	★★★	★★	★★	10★
	Adjust Water Pump Operating Frequency	★★★	-	★★	★★	★★★	8★
Energy Conservation Management	Interlock Fan Operation with CO_2 Monitoring Install Sub-Metering Systems Prevent Supply Air Short-Circuiting	★★	★	★★	★★	★★★	8★

9 Implementation of Energy-Saving Systems

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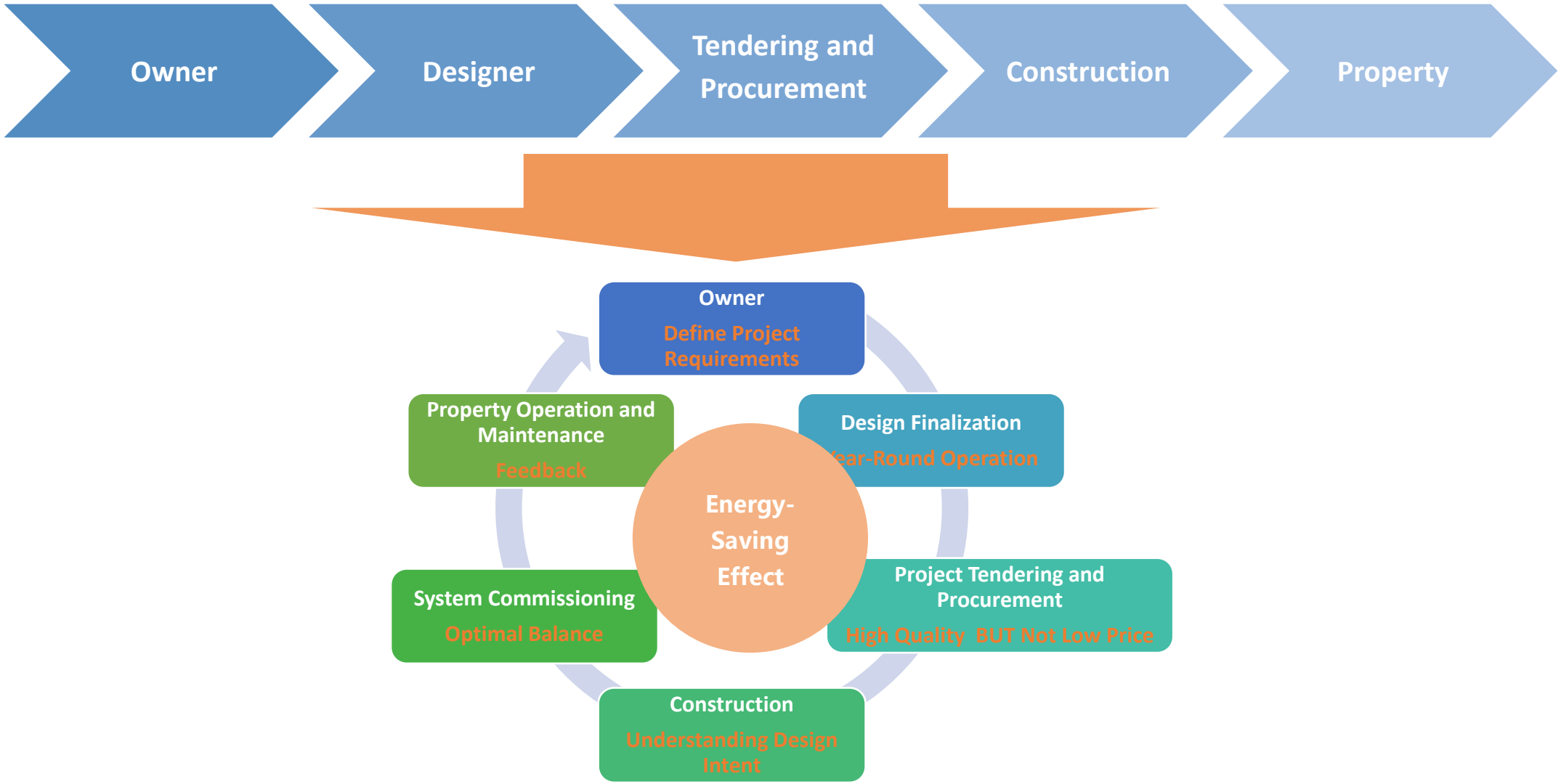
- Shift from the Linear Sequential Implementation Model



10.1 Energy-Saving Technology Case Studies

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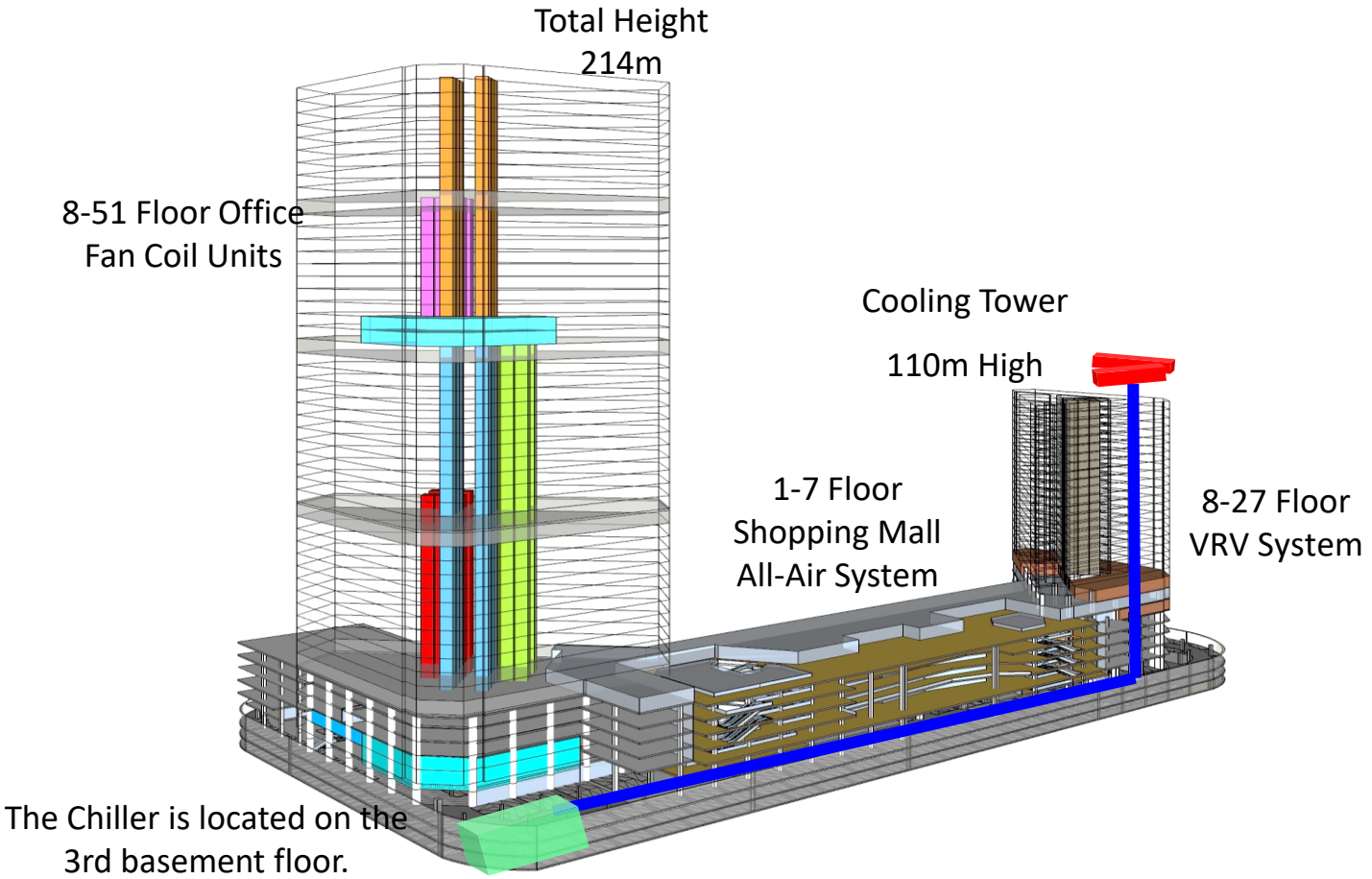
GuangZhou ICC Building **High-Efficiency Chiller Plant System**

- Total Gross Floor Area (GFA): 229,000 ㎡
- Types of Air-Conditioning Terminal Units: Tower Office Area -- Fan Coil Units (FCU);
  Podium Commercial Area -- All-Air System
- Operation Commencement Date： Office Area -- Dec. 2019， Commercial Area -- Sep. 2020



10.2 Energy-Saving Technology Case Studies

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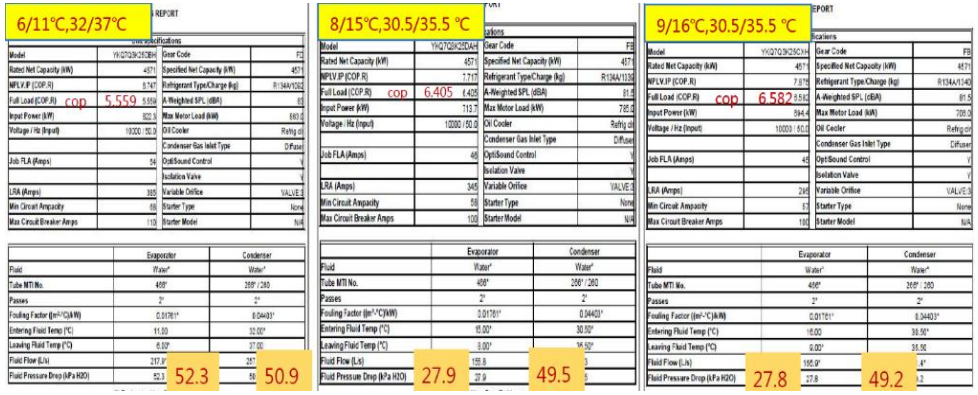
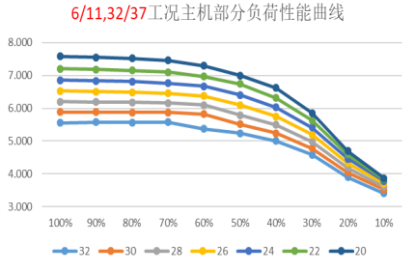
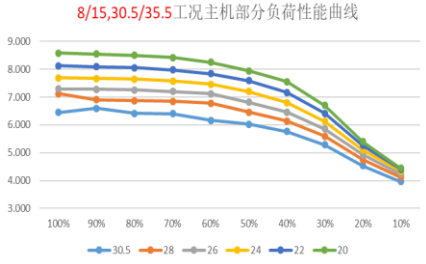
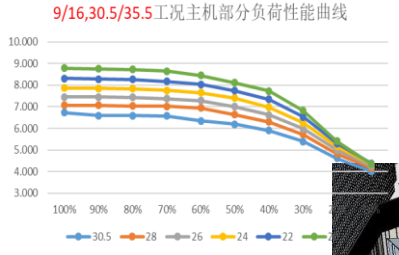
Selected Energy-Saving Technology

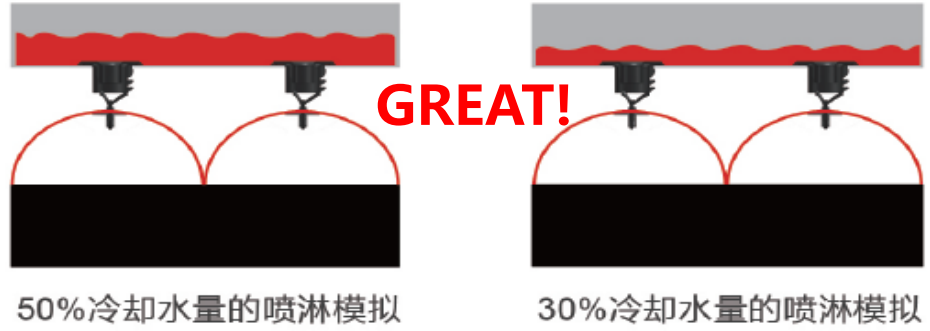
- Variable-Flow Cooling Tower
- Adjust Chilled Water Temperature
- Optimize Cooling Tower Heat Dissipation Performance

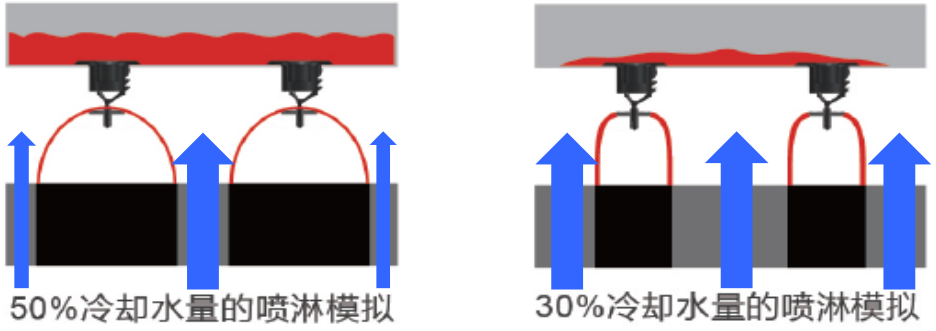


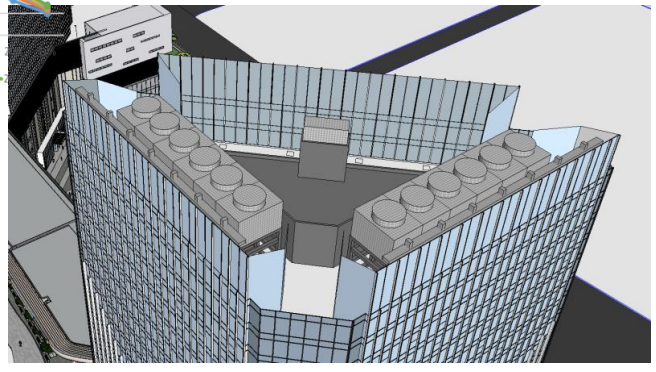


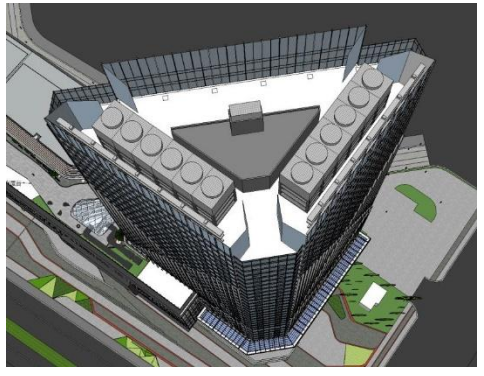












10.3 Energy-Saving Technology Case Studies

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Comparison of Implementation Effects

☐Reduction in Installed Capacity,Up to**11%**

5300 RT → -11% → **4700 RT**

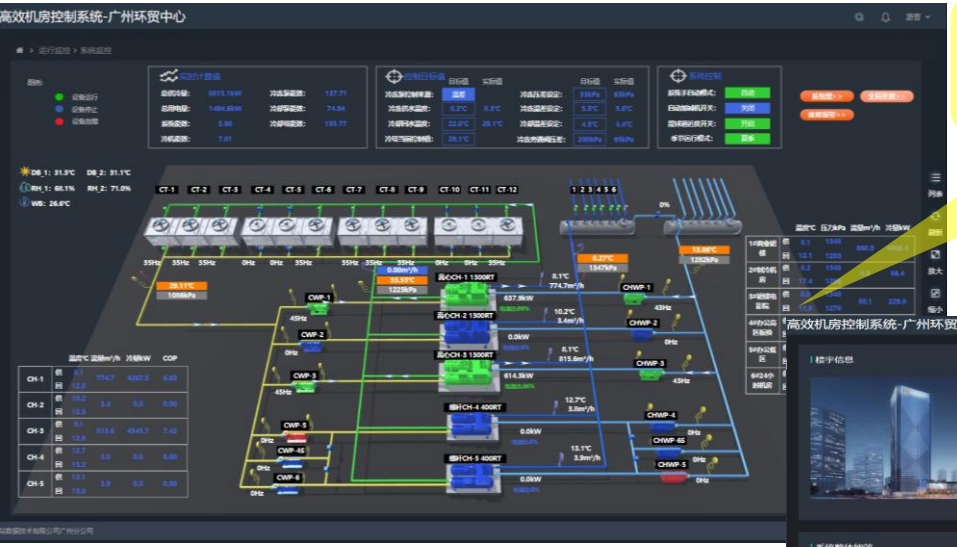
☐Water System Optimization， Reduction in Pump Power Consumption,Up to **54%**

1160 kW → -54% → **539 kW**

No.	Item	Original Design	**High-Efficiency Chiller Plant System**	Remarks
1	Installed Capacity	Total: 5300RT 1500RT*3+400RT*2	Total: 4700RT 1300RT*3+400RT*2	Reduction in Installed Capacity11%
2	Chilled Water Temperature	Lower Zone 6/12.5°C High Zone 7/13.5°C	Lower Zone 8/15°C High Zone 9/16°C	Water Temperature Adjustment Chiller Efficiency Improvement 12%
3	Condenser Water Temperature	32/37 °C	30.5/35.5°C	
4	Chilled Water Pump	Flow Rate： 705 m^3/h Power： 132 kW Flow Rate： 190 m^3/h Power： 37 kW	Flow Rate： 590 m^3/h Power： 55 kW Flow Rate： 180 m^3/h Power： 22 kW	Total Pump Power Reduce 54%
5	Condenser Water Pump	Flow Rate： 1150 m^3/h Power： 200 kW Flow Rate： 305 m^3/h Power： 45 kW	Flow Rate： 965 m^3/h Power： 90 kW Flow Rate： 300 m^3/h Power： 30 kW	
6	Cooling Tower	Flow Rate： 500 m^3/h *11 1.04 m^3/RT	Flow Rate： 400 m^3/h *12 1.02 m^3/RT	

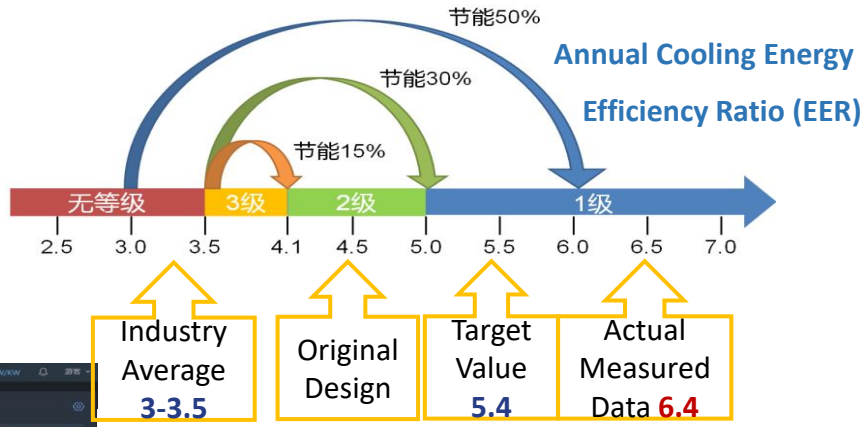
10.4 Energy-Saving Technology Case Studies

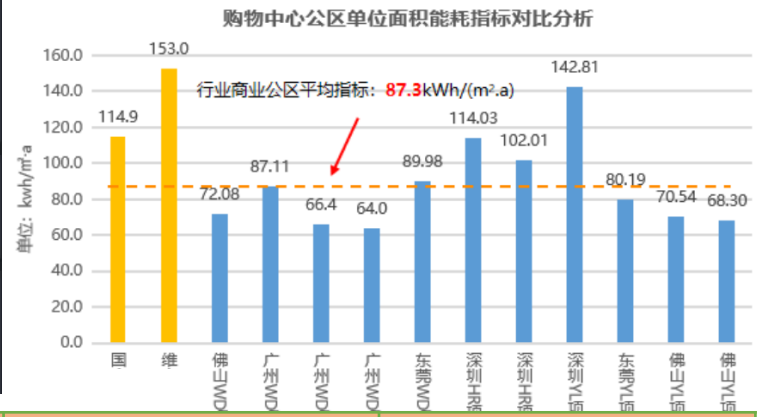
Implementation Outcomes and Achievements



Real-time visibility of cooling load for all business formats

Visualized display of chiller efficiency





	GuangZhou ICC Building（office format）	GuangZhou ICC Building（retail format）	X Building（office format）	WuHan X Building（office format）	GuangZhou X Building（office & retail format）	GuangZhou X Building（retail format）
Annual Cooling Electricity Consumption per Unit Area（kW.h/㎡.a）	**6.3**	**8.2**	8.9	8.8	13.7	12.0

- The government-released 2021 annual electricity consumption benchmark per unit area for public buildings 112.6kW/㎡,
- Annual Cooling Electricity Consumption per Unit Area **16kW.h/㎡.a**

11 Exploration of Engineering Models

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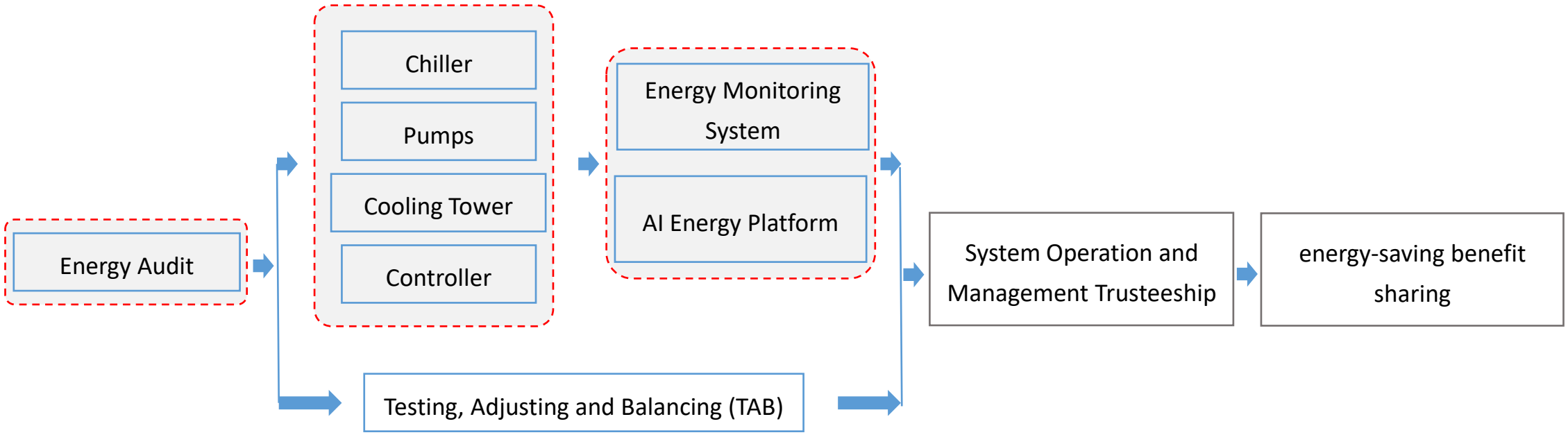
Capital Investment + **Hardware Upgrade** + **System Upgrade** = **Energy-Saving Benefits**

Traditional Model: Owner Investment， All energy-saving benefits accrue to Owner .

Base on the Air-Conditioning System Quality

BOT mode： **Introduce third-party investment**， Generate profits by selling chilled water to Owner.

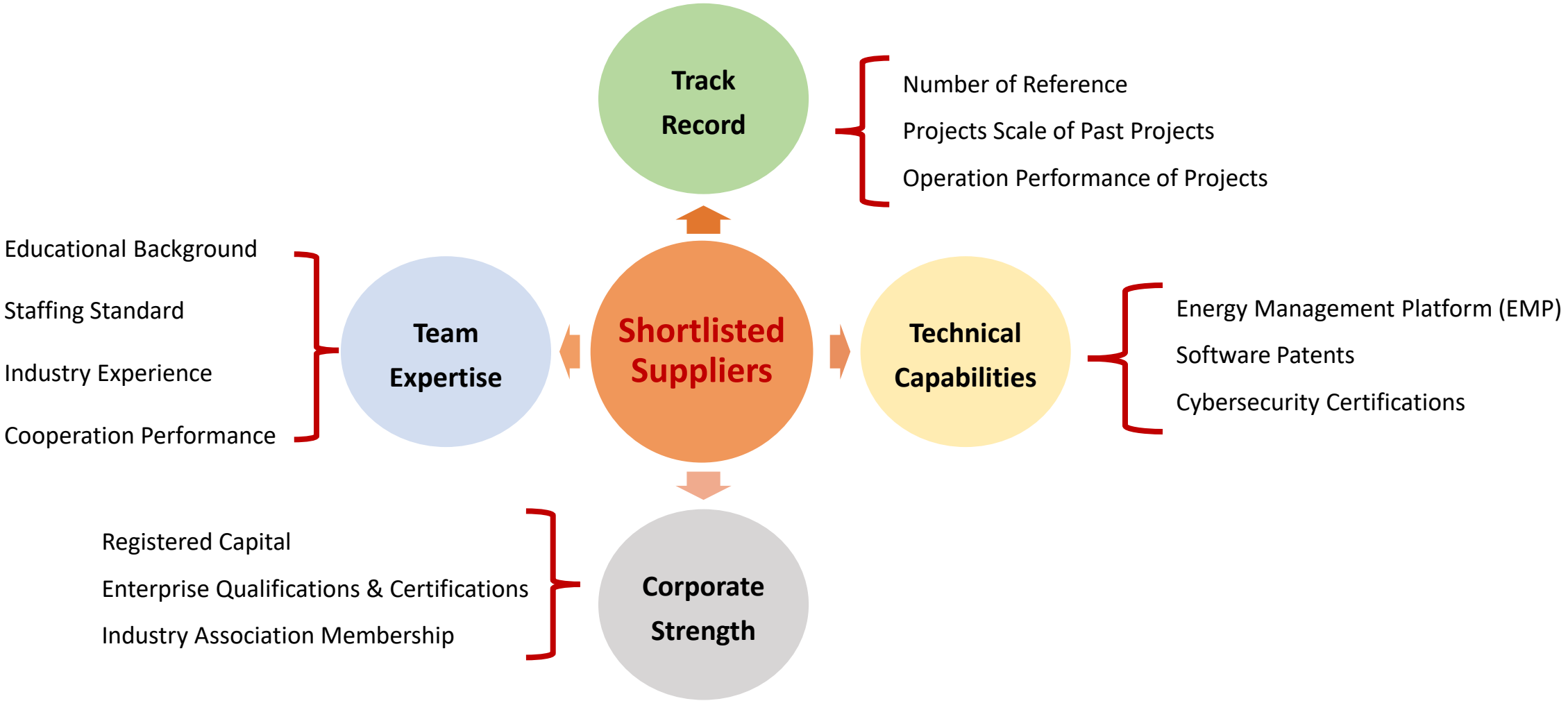
EMC mode： **Introduce third-party investment**， Generate profits through energy-saving benefit sharing.



12 How to Choose Energy-Saving Suppliers

- Suppliers are evaluated across four dimensions:

Track record of past projects, technical capabilities, team expertise, corporate strength



13 Evaluation of Energy-Saving Service Suppliers

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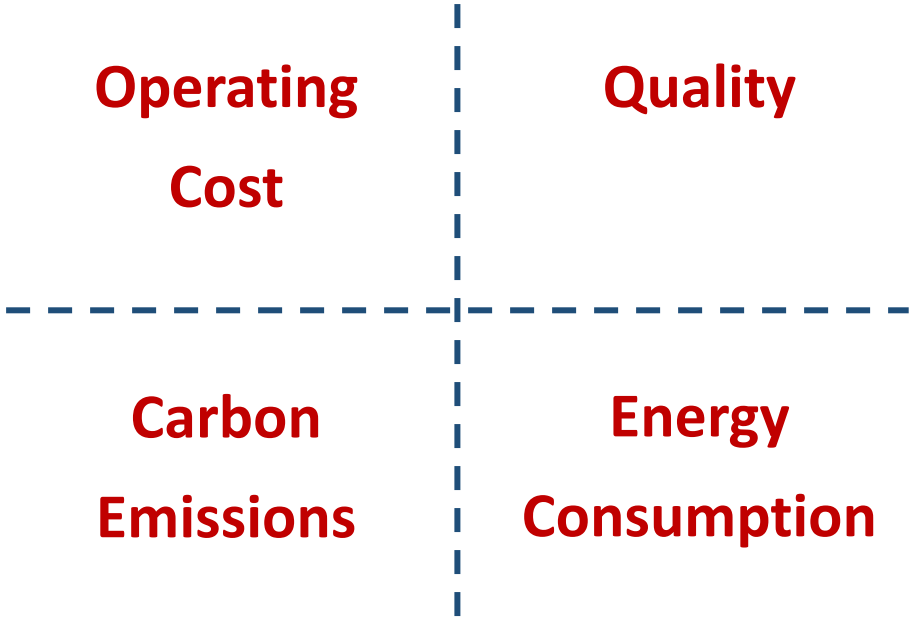
Energy-Saving Suppliers	Past Project Track Record		technical capabilities			team expertise		corporate strength		
	Numbers	Scale	EMP	Software Patents	Cybersecurity Certifications	Core Members Educational Background	Staffing Standard	Registered Capital	Enterprise Nature	Industry Association
XX Energy-Saving Company	12		√	√	√		√	7280		Member of XX Industry Association
XX Energy-Saving Company	8		√	√	√		√	1440.21		Member of XX Industry Association
XX Energy-Saving Company	6		√	√	√		√	2287.37		Member of XX Industry Association
XX Energy-Saving Company	3		√	√	√		X	4361		Member of XX Industry Association
XX Energy-Saving Company	2		X	X	X		X	900		X
XX Energy-Saving Company	1		X	X	X		X	1000		Member of XX Industry Association
XX Energy-Saving Company	1		X	X	X		X	1600		X

14 Summary on Energy Conservation

- Commercial projects are characterized by high energy consumption, creating an urgent demand for energy-saving retrofits.
- Property developers should clearly define their own core demands.
- Energy audits are required to provide the basis for decision-making and judgment.



不断超越　更加优秀

Thank you