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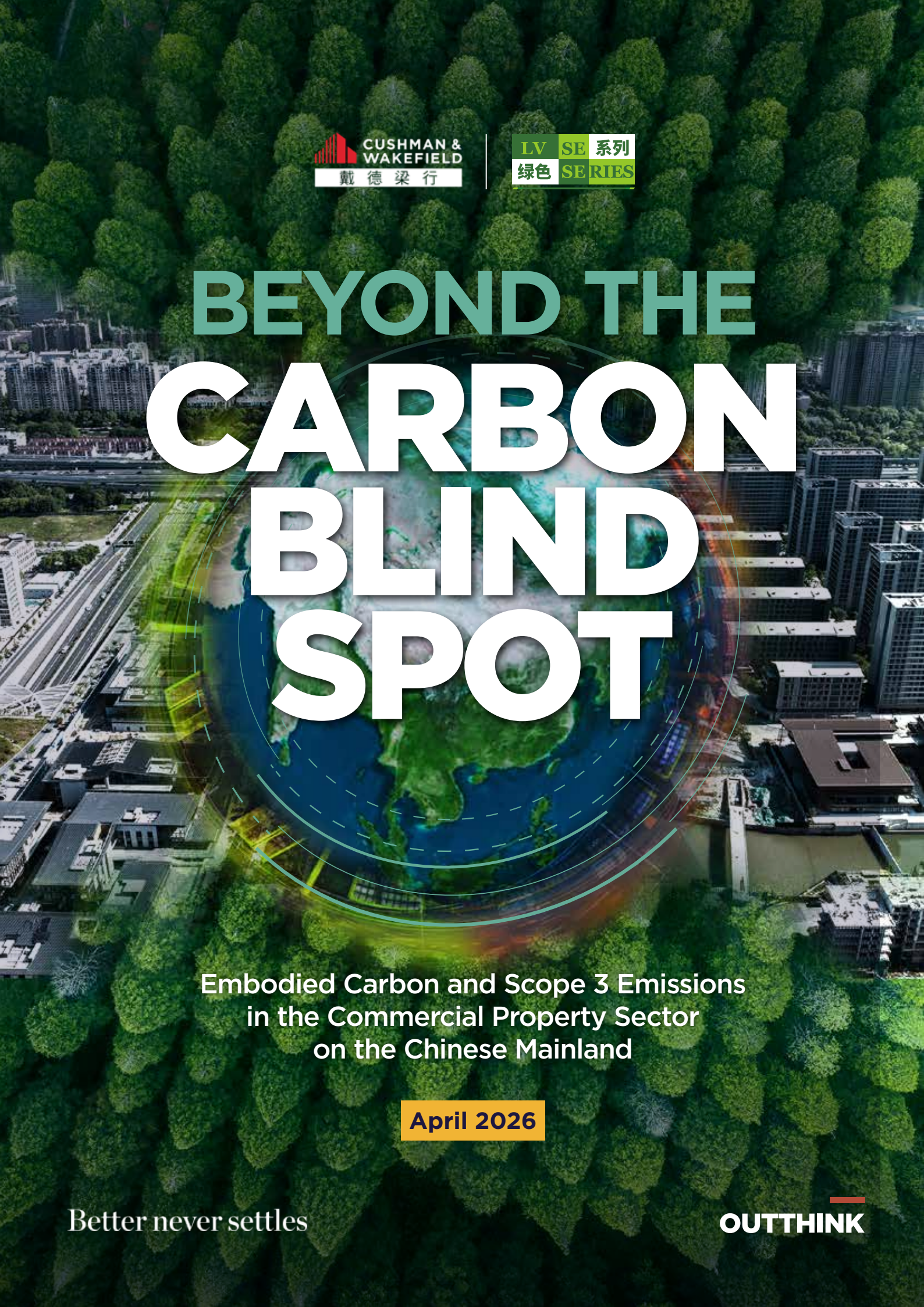
BEYOND THE CARBON BLIND SPOT



Embodied Carbon and Scope 3 Emissions in the Commercial Property Sector on the Chinese Mainland

April 2026

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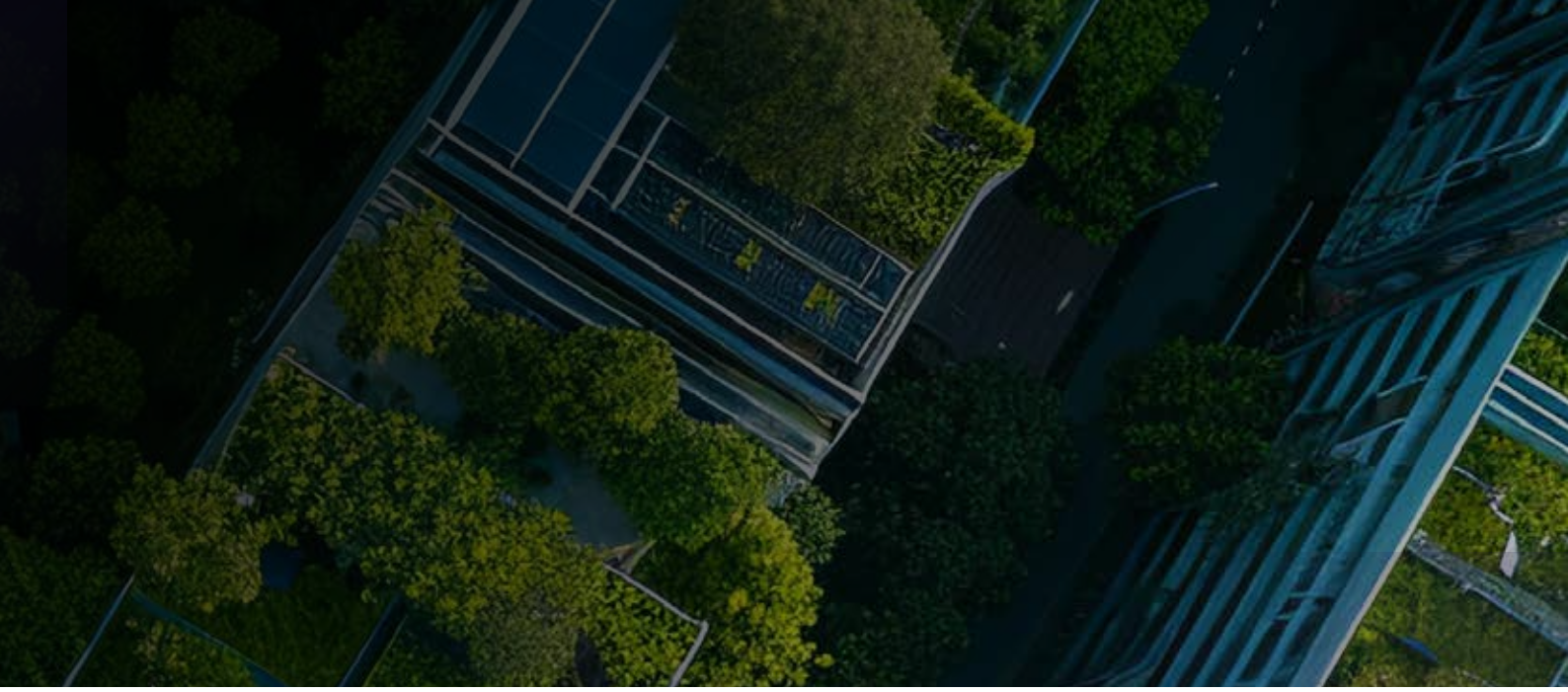
EXECUTIVE SUMMARY

For more than a decade, carbon reduction strategies in the commercial real estate sector have focused overwhelmingly on operational emissions – energy consumed during a building's use phase. While this focus has delivered measurable improvements in energy efficiency and operational performance, it now represents a carbon blind spot. On the Chinese mainland, where development volumes, capital recycling, and asset repositioning remain structurally significant, embodied carbon and Scope 3 emissions increasingly dominate a building's total carbon footprint.

Embodied carbon – emissions associated with the extraction, manufacture, transport, installation, maintenance, and disposal of building materials – can account for 30–70% of a commercial building's whole-life carbon emissions, depending on asset type, construction method, and lifespan. When combined with Scope 3 emissions across investment portfolios, tenant operations, and supply chains, these "indirect" emissions often exceed operational (Scope 1 and 2) emissions by a substantial margin.

On the Chinese mainland, this challenge is amplified by several structural factors, including:

- A large stock of relatively young but functionally dated commercial buildings – given the rapid advancement of construction quality and installed building technology;
- High levels of demolition and redevelopment, particularly in Tier 1 and core Tier 2 cities;
- Capital markets increasingly aligned with global environmental, social, and governance (ESG) frameworks, even where some local disclosure requirements remain varied, and;
- Multinational occupiers applying global net-zero commitments to Chinese mainland-based portfolios.



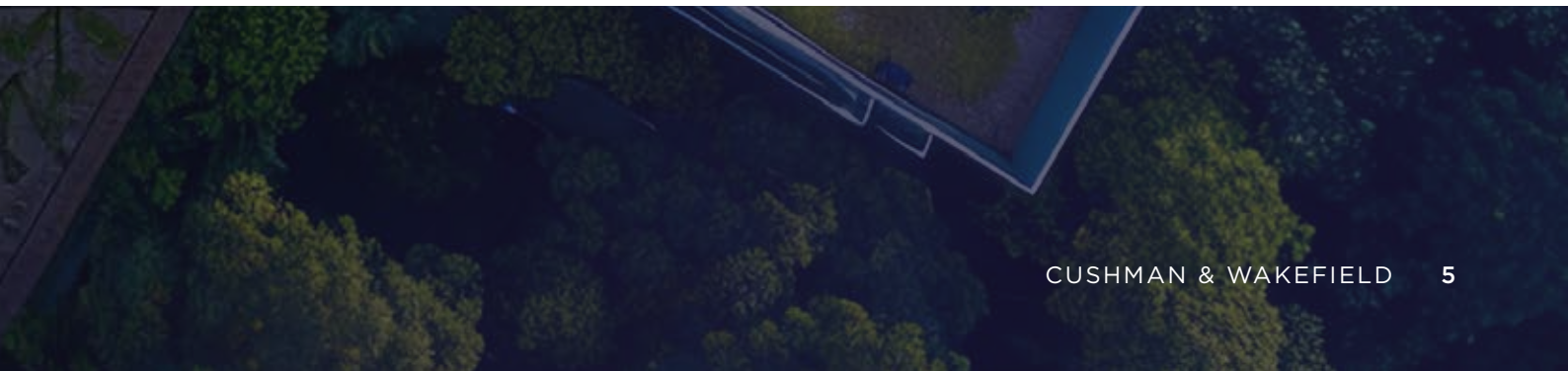
As a result, on the Chinese mainland, embodied carbon and Scope 3 emissions are rapidly becoming material financial and strategic issues rather than purely environmental considerations. Investors face growing scrutiny, operating landlords must respond to tenant demand for low-carbon space while balancing refurbishment costs and asset value, and developers are under increasing pressure to justify demolition-led strategies. At the same time, tenants are recognising that leased space often represents their largest single source of reported emissions.

This report draws on a series of case studies carried out by Cushman & Wakefield, demonstrating how embodied carbon and Scope 3 considerations are being applied in practice across new developments, refurbishments, and asset repositioning projects. These examples provide insight into actionable strategies that materially influence investment, design, and operational decisions.

With this understanding, the commercial property sector on the Chinese mainland has reached a critical inflection point. Managing embodied carbon and Scope 3 emissions is no longer optional. It is central to:

Asset valuation and liquidity	Leasing competitiveness	Access to capital and green financing	Building regulatory preparedness	Long-term portfolio resilience

In conclusion, the most successful market participants will be those who move early – embedding whole-life carbon thinking into investment decisions, design choices, leasing strategies, and asset management practices, rather than treating embodied carbon as a future compliance issue.



1 Why Operational Carbon Is No Longer Enough

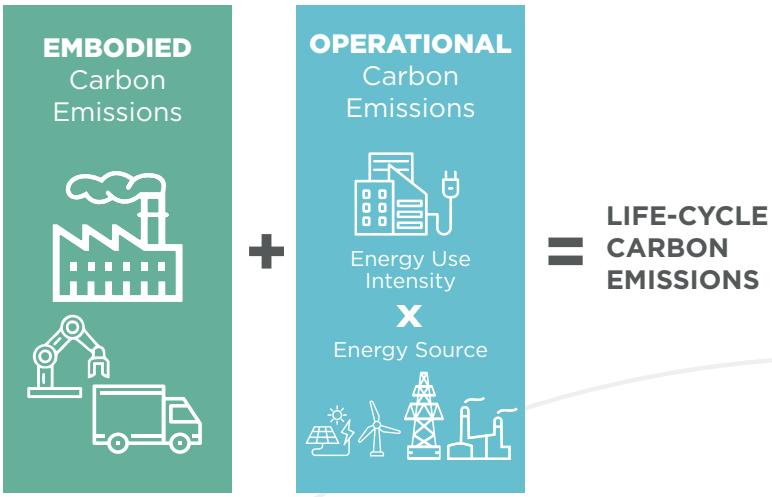
While operational carbon has long been the focus of building sustainability efforts, rising awareness of embodied emissions shows that managing a building's full lifecycle impact is essential for meaningful decarbonisation.

THE LIMITS OF THE OPERATIONAL CARBON PARADIGM

Operational carbon – emissions from heating, cooling, lighting, and power use – has historically been the easiest component of building emissions to measure and manage. On the Chinese mainland, policy initiatives such as green building standards, minimum energy performance requirements, and building energy disclosure pilots have reinforced this focus.

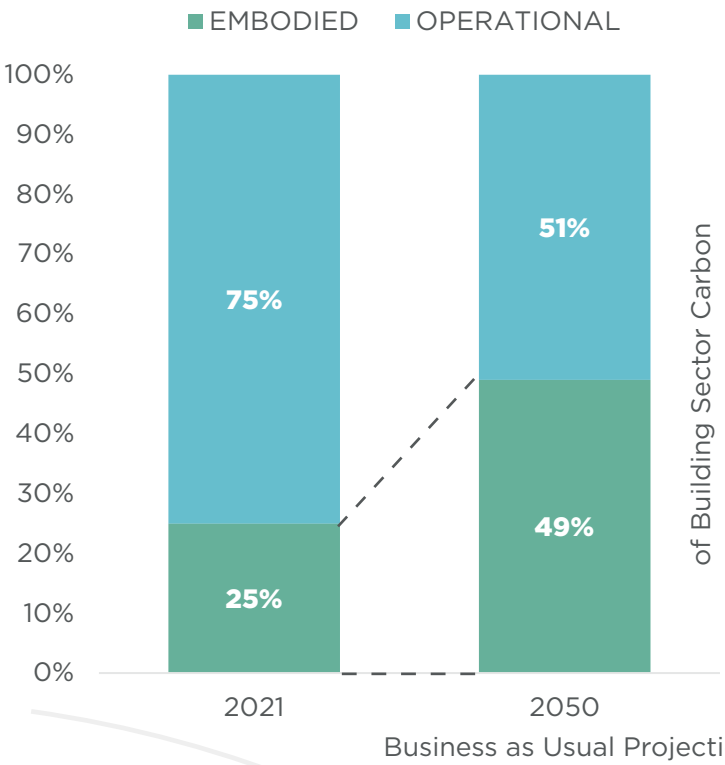
However, this approach is increasingly misaligned with reality. As operational efficiency improves through better building systems, smart technologies, and grid decarbonisation, the relative share of embodied carbon rises sharply. In highly efficient office buildings, embodied carbon can represent the majority of total lifecycle emissions within the first 20–30 years of operation (Figures 1 and 2).

Figure 1: Embodied and Operational Carbon Emissions



A building's carbon footprint over its lifespan is the sum of its embodied plus operational emissions.
Source: United Nations Environment Programme, Cushman & Wakefield Research

Figure 2: Share of Embodied vs Operational Carbon Over a Building Life Cycle



Projected contributions from embodied and operational carbon within the building sector.
Under business as usual, embodied emissions will contribute nearly half of all building emissions by mid-century.
Source: United Nations Environment Programme, Cushman & Wakefield Research

This shift has profound implications for commercial property markets on the Chinese mainland, where:

- Buildings are often redeveloped or substantially refurbished well before the end of their structural life
- Capital value is frequently driven by specification upgrades rather than long-term operational optimisation
- Demolition and reconstruction remain common responses to functional obsolescence

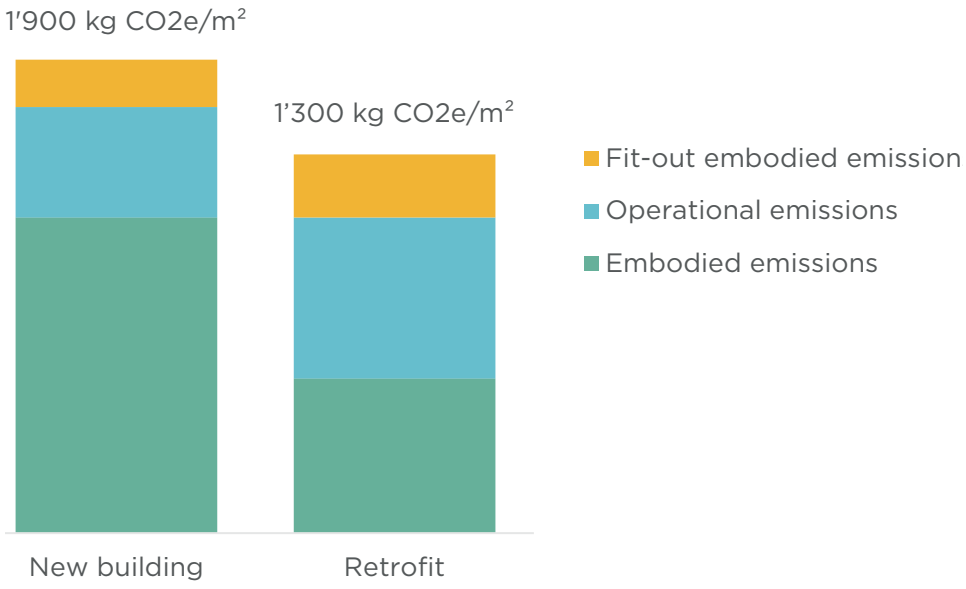
THE REDEVELOPMENT PARADOX

A central paradox has emerged in the Chinese mainland market: new buildings are typically more energy efficient, but the act of demolishing and rebuilding can generate such high levels of embodied carbon that total lifecycle emissions exceed those of a retained and retrofitted asset (Figure 3).

This paradox is particularly relevant in mature office submarkets in Beijing, Shanghai, Shenzhen, and Guangzhou, where:

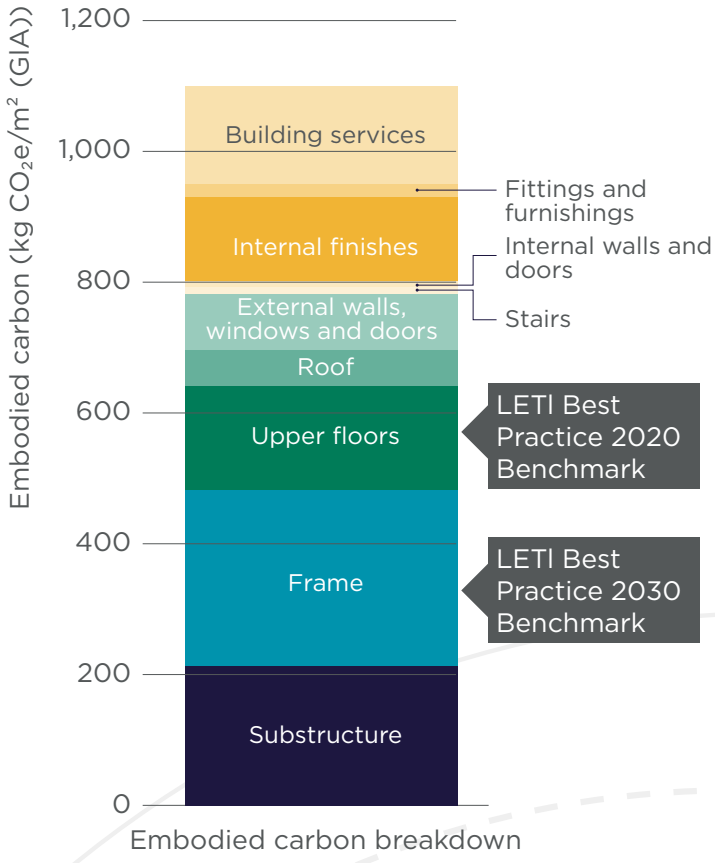
- Substructure and structural frames remain sound (Figure 4);
- Floor plates may be adaptable, and;
- Carbon-intensive demolition is often economically, rather than technically, driven.

Figure 3: Carbon Impact Comparison – Commercial Building Demolish & Rebuild vs Deep Retrofit



Quantities assume a 10'000 m² building with a lifetime of 20 years and 1 fit-out
Source: 2050 Materials, Cushman & Wakefield Research

Figure 4: Typical Commercial Building Substructure and Structural Frame Carbon Impact – One Third of Total Embodied Carbon



Source: 2050 Materials, Cushman & Wakefield Research

GRID DECARBONISATION AND DIMINISHING RETURNS

The power grid on the Chinese mainland is decarbonising steadily, supported by large-scale renewable deployment and electrification. While this is positive for operational emissions, it also means that future carbon reductions from energy efficiency alone will be incrementally smaller.

As a result, focusing exclusively on operational carbon risks:

- Overstating future decarbonisation pathways;
- Underestimating whole-life emissions, and;
- Creating stranded assets from a carbon perspective, even if energy performance is strong.

2 Understanding Embodied Carbon in Commercial Real Estate

Understanding embodied carbon lays the foundation for assessing the broader climate impact of commercial real estate, including the often-overlooked Scope 3 emissions across a building's lifecycle and value chain.

WHAT IS EMBODIED CARBON?

Embodied carbon refers to greenhouse gas emissions generated across a building's lifecycle excluding operational energy use (Figure 5). It is typically categorised into:

Upfront carbon

Materials extraction, manufacturing, transport, and construction

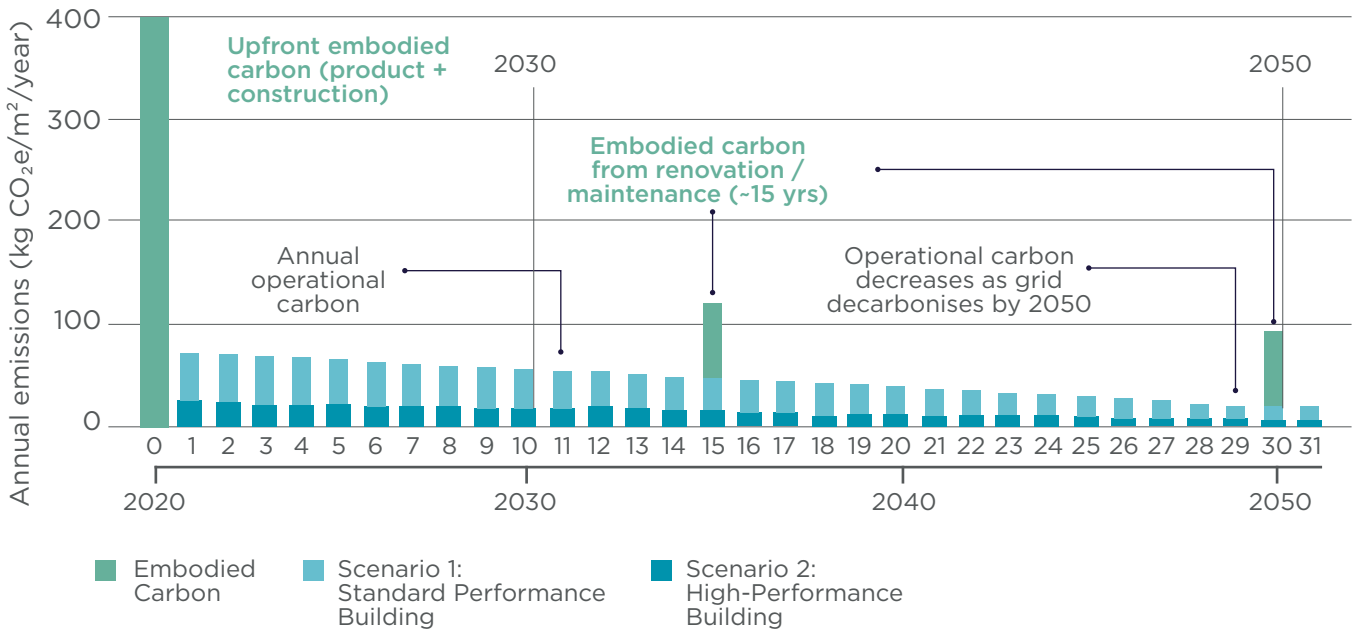
In-use embodied carbon

Maintenance, repair, replacement

End-of-life carbon

Demolition, waste processing, disposal or recycling

Figure 5: Embodied Carbon Across the Building Life Cycle (A1–C4)



Projected impact of embodied carbon relative to the operational carbon over the building's lifespan.
Operational carbon will continue to decrease with grid decarbonisation, while embodied carbon is set to remain high without meaningful action.
Source: United Nations Environment Programme, Cushman & Wakefield Research

In commercial real estate, upfront embodied carbon is often the largest and most immediate component, released before a building becomes operational.

KEY SOURCES OF EMBODIED CARBON

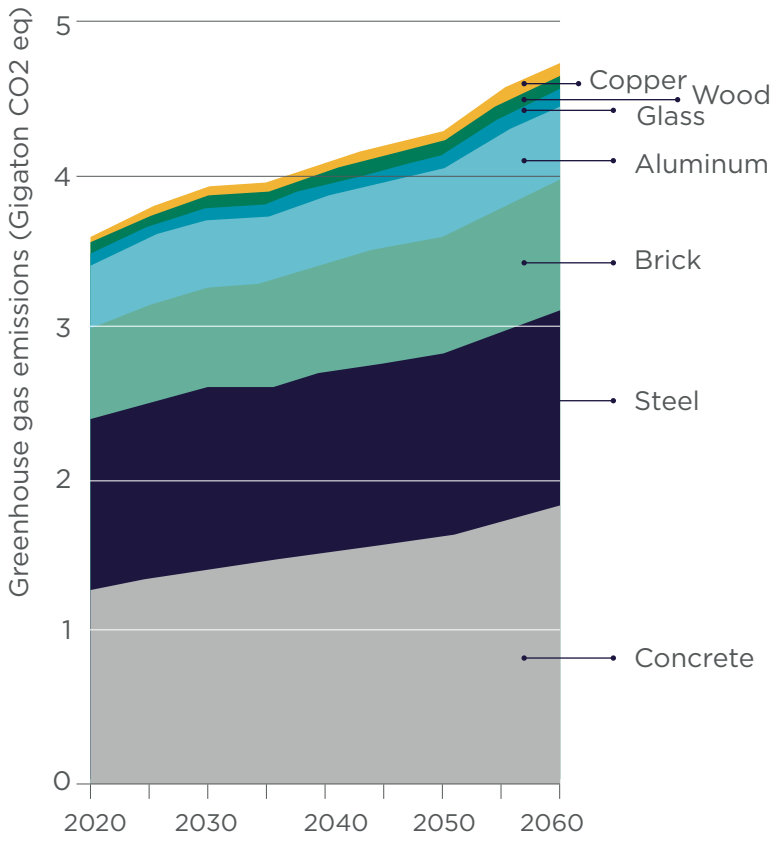
In commercial buildings on the Chinese mainland, embodied carbon is concentrated in a relatively small number of materials, including:

- Concrete (cement production);
- Steel (structural frames and reinforcement);
- Brick (internal partition walls, decorative walls, etc);
- Aluminium (façades);
- Glass (curtain wall systems);
- Wood (fixtures and fittings), and;
- Copper (wiring, plumbing, heating, ventilation, and air conditioning (HVAC), etc).

With demand for these materials expected to continue to grow, greenhouse gas emissions are also expected to rise with each material (Figure 6).

High-specification Grade A offices – particularly those with extensive curtain wall façades – can exhibit significantly higher embodied carbon intensity than more modestly specified assets.

Figure 6: Typical Material Contribution to Embodied Carbon in Office Buildings and Expected Emissions Rise to 2060



Source: Zong et al (2021), Cushman & Wakefield Research

WHY EMBODIED CARBON IS RISING IN IMPORTANCE ON THE CHINESE MAINLAND

Several market dynamics make embodied carbon especially relevant on the Chinese mainland, including:

- Continued urban regeneration;
- An interest in landmark architecture and premium specifications;
- Shorter asset holding periods relative to building lifespans, and;
- Growing alignment with international ESG benchmarks.

For global investors and occupiers, embodied carbon is now part of portfolio-level climate risk assessment, regardless of local disclosure requirements.

3 Scope 3 Emissions: The Hidden Majority

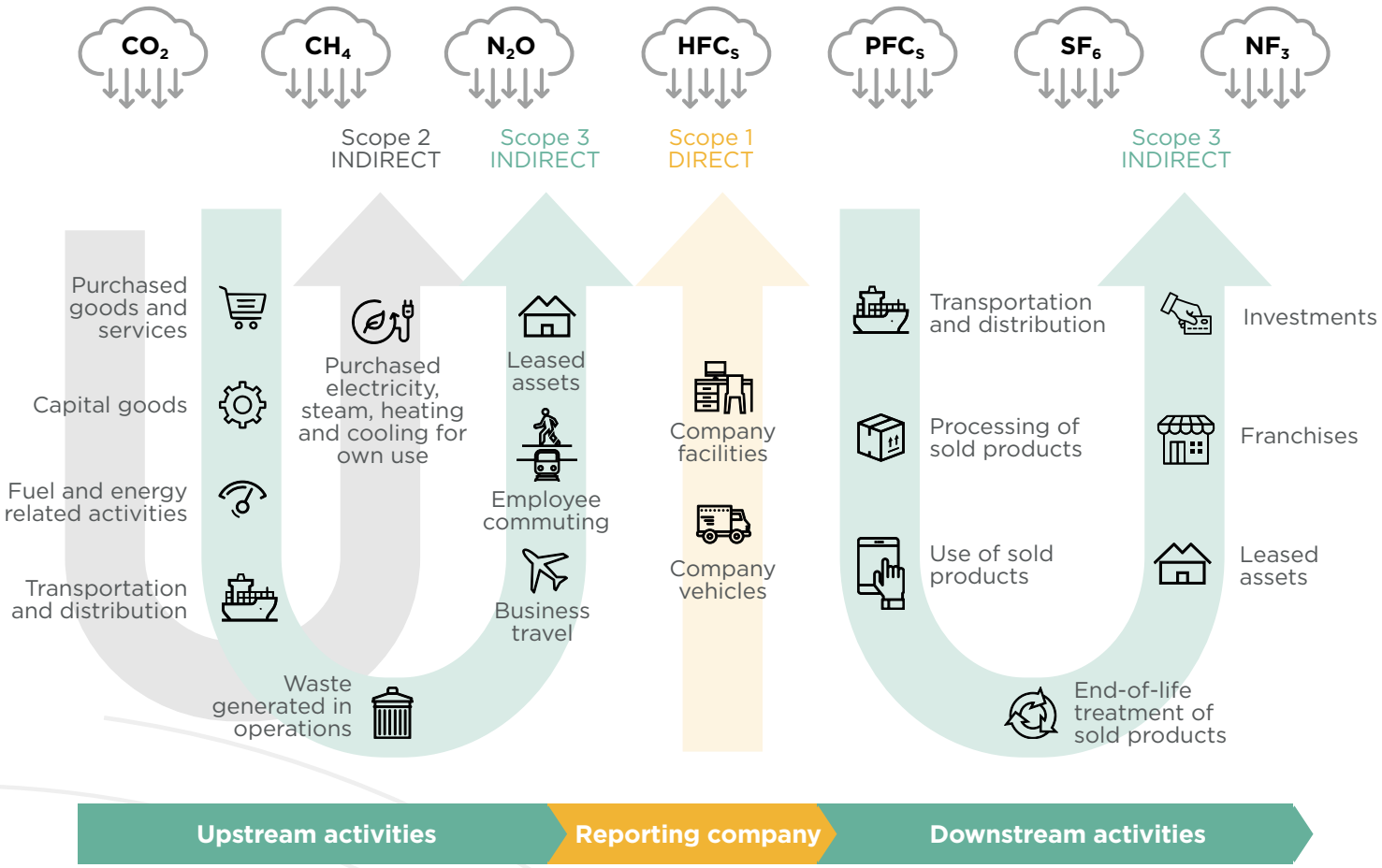
Recognising and managing Scope 3 emissions is now essential for commercial real estate, as indirect carbon across the value chain increasingly shapes investor decisions, tenant expectations, and long-term asset resilience.

DEFINING SCOPE 3 IN REAL ESTATE

Scope 3 emissions encompass all indirect emissions that occur outside an organisation's direct control but within its value chain (Figure 7). In commercial real estate, this includes:

- Embodied carbon in construction materials;
- Tenant energy use (for operating landlords);
- Operating landlord-provided building services (for tenants);
- Capital goods and refurbishment work, and;
- Business travel and supply chain activities.

Figure 7: Scope 1, 2 and 3 Emissions in Commercial Real Estate



Source: Cushman & Wakefield Research

For most property investors and occupiers, Scope 3 emissions represent the largest share of reported emissions.

SCOPE 3 AND LEASED ASSETS

Leased commercial space creates a complex emissions boundary:

- Investors and operating landlords typically control the asset, and;
- Tenants control significant portions of energy consumption.

Both parties report emissions differently, and this "split incentive" issue is particularly acute in multi-tenant office buildings common across major cities on the Chinese mainland.

WHY SCOPE 3 NOW MATTERS COMMERCIALLY

Scope 3 emissions are no longer abstract or voluntary. They are increasingly:

- Required by global disclosure frameworks;
- Scrutinised by institutional investors;
- Embedded in tenant sustainability reporting, and;
- Linked to science-based targets and net-zero pathways.

For Chinese mainland-based assets held by global capital, Scope 3 performance increasingly influences capital allocation decisions, even in the absence of strict local mandates.

4 Stakeholder Impacts: Why Embodied Carbon and Scope 3 Matter to Everyone

Embodied carbon and Scope 3 emissions affect all commercial real estate stakeholders, but the nature of that impact varies significantly depending on role, timing, and degree of control. For some stakeholders, embodied carbon represents an immediate design and construction decision; for others, it manifests as a long-term investment, leasing, or disclosure risk. Recognising these differences is essential to developing strategies that are both commercially viable and aligned with decarbonisation objectives.

DEVELOPERS

RETHINKING THE DEMOLITION DEFAULT

Developers face the most immediate and concentrated embodied carbon decisions, as the majority of lifecycle emissions are locked in during the early stages of development. Historically, development models on the Chinese mainland have prioritised speed, scale, and specification, reflecting strong occupier demand and rapid urban expansion.

However, this approach is increasingly challenged by shifting investor expectations, evolving local government sustainability objectives, and rising construction and material costs. In response, low-carbon development strategies are gaining traction, particularly for projects targeting long-term institutional ownership.

From an embodied carbon perspective, leading development responses increasingly focus on:

- Retaining and reusing existing structural elements;
- Improving material efficiency and substituting high-carbon inputs;
- Adopting modular or prefabricated construction methods, and;
- Designing buildings for adaptability and future reuse.

While these approaches require earlier-stage assessment and closer collaboration across the supply chain, they can materially reduce upfront carbon intensity and enhance long-term asset resilience.

INVESTORS

FROM ESG COMPLIANCE TO FINANCIAL MATERIALITY

For institutional investors, embodied carbon and Scope 3 emissions are rapidly shifting from qualitative ESG considerations to financially material risks and opportunities. Global capital allocating to Chinese mainland assets is increasingly shaped by portfolio-level net-zero commitments, mandatory climate disclosures in home jurisdictions, and participation in benchmarking frameworks such as the International Sustainability Standards Board (ISSB), (which builds on the Task Force on Climate-related Financial Disclosures (TCFD) framework), and GRESB (Figure 8).

Figure 8: Core Elements of Recommended Climate-Related Disclosures

Governance
The organisation's governance around climate-related risks and opportunities

Strategy
The actual and potential impacts of climate-related risks and opportunities on the organisation's businesses, strategy, and financial planning

Risk Management
The processes used by the organisation to identify, assess, and manage climaterelated risks

Metrics and Targets
The metrics and targets used to assess and manage relevant climate-related risks and opportunities

Source: TCFD, Cushman & Wakefield Research

Embodied carbon is particularly significant for investors because it is largely irreversible once an asset is acquired or developed and directly influences alignment with science-based targets and portfolio carbon intensity metrics.

As a result, investors are increasingly assessing assets based on:

- Embedded carbon intensity at acquisition or completion;
- Alignment with long-term decarbonisation pathways;
- Exposure to future regulatory and disclosure requirements, and;
- Implications for liquidity, pricing, and exit optionality.

Assets with high embedded carbon face growing risks of discounting and capital expenditure pressure, while early movers benefit from stronger ESG performance, improved access to green finance, and enhanced marketability.

OPERATING LANDLORDS

LEASING COMPETITIVENESS AND ASSET OBSOLESCENCE

For operating landlords, embodied carbon and Scope 3 emissions are increasingly influencing leasing performance rather than remaining abstract sustainability metrics. Multinational and domestic corporate occupiers are placing greater emphasis on carbon transparency, low-carbon fit-out pathways, and the inclusion of sustainability provisions within lease structures.

Buildings that cannot demonstrate credible whole-life carbon performance risk becoming less competitive, particularly in core markets and premium submarkets.

From a leasing and asset management perspective, this is driving demand for:

- Building-level whole-life carbon data;
- Clear landlord-supported fit-out and refurbishment guidelines, and;
- Leasing narratives that link sustainability performance to occupier outcomes.

In Tier 1 cities on the Chinese mainland, this dynamic is already visible in technology clusters, life sciences parks, and international business districts, where sustainability credentials increasingly influence tenant decision-making.

TENANTS

LEASED SPACE AS A SCOPE 3 HOTSPOT

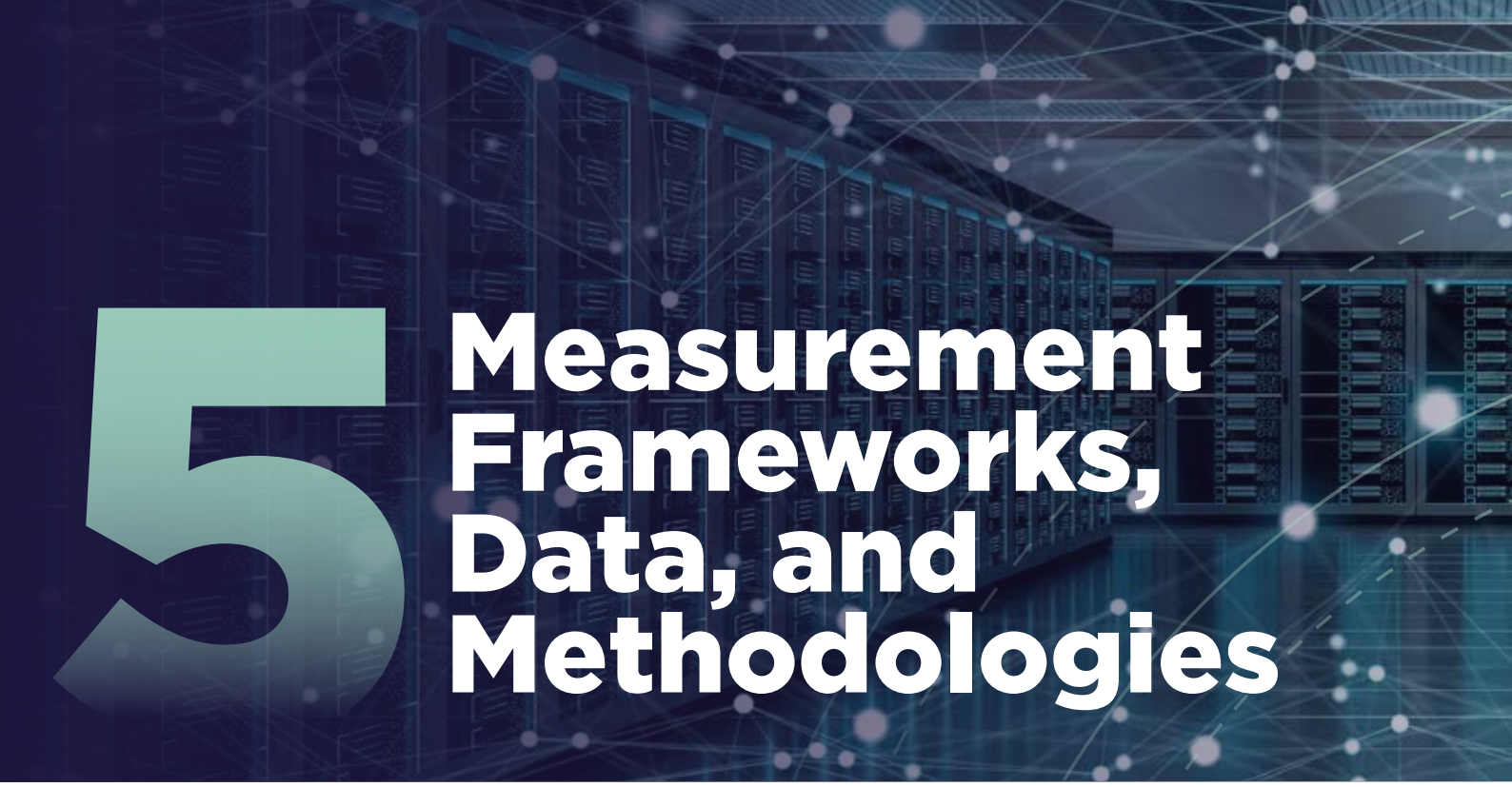
For occupiers, leased real estate is often one of the largest and least controllable sources of Scope 3 emissions, particularly for office-based companies. While tenants typically have limited influence over base building design and materials, they remain accountable for emissions associated with leased space in corporate reporting.

Data availability, control over building systems, and misaligned landlord-tenant incentives remain persistent challenges, particularly in multi-tenanted assets.

As a result, occupiers are increasingly responding by:

- Prioritising low-embodied-carbon buildings during site selection;
- Requiring green lease provisions and data-sharing mechanisms, and;
- Actively engaging landlords on carbon reduction initiatives.

On the Chinese mainland, these trends are most pronounced among technology firms, professional services companies, and life sciences and research and development (R&D) occupiers, where global reporting obligations and talent considerations reinforce the importance of low-carbon real estate strategies.



5 Measurement Frameworks, Data, and Methodologies

Robust measurement frameworks and consistent methodologies are fundamental to the effective management of embodied carbon. While data availability and methodological consistency remain evolving challenges on the Chinese mainland, the increasing adoption of whole-life carbon assessment and internationally recognised standards is enabling more informed decision-making at both asset and portfolio level. Importantly, the market is placing growing emphasis not only on precision, but also on transparency, governance, and directional improvement, creating a practical pathway towards higher-quality reporting and long-term decarbonisation.

PORTFOLIO-LEVEL SCOPE 3 ACCOUNTING

At the portfolio level, Scope 3 emissions represent the most significant and complex component of a real estate company's carbon footprint. For commercial property portfolios, Scope 3 accounting typically focuses on three core areas: capital goods associated with construction and major refurbishments; tenant energy consumption within leased assets, and; downstream leased assets.

Across the Chinese mainland, investors and asset owners are progressively expanding data coverage and refining estimation methodologies in these areas. While full data completeness remains a medium-term objective, current best practice increasingly prioritises clear boundary setting, consistent assumptions, and transparent disclosure, recognising that credible progress and governance are as important as absolute accuracy at this stage of market development.

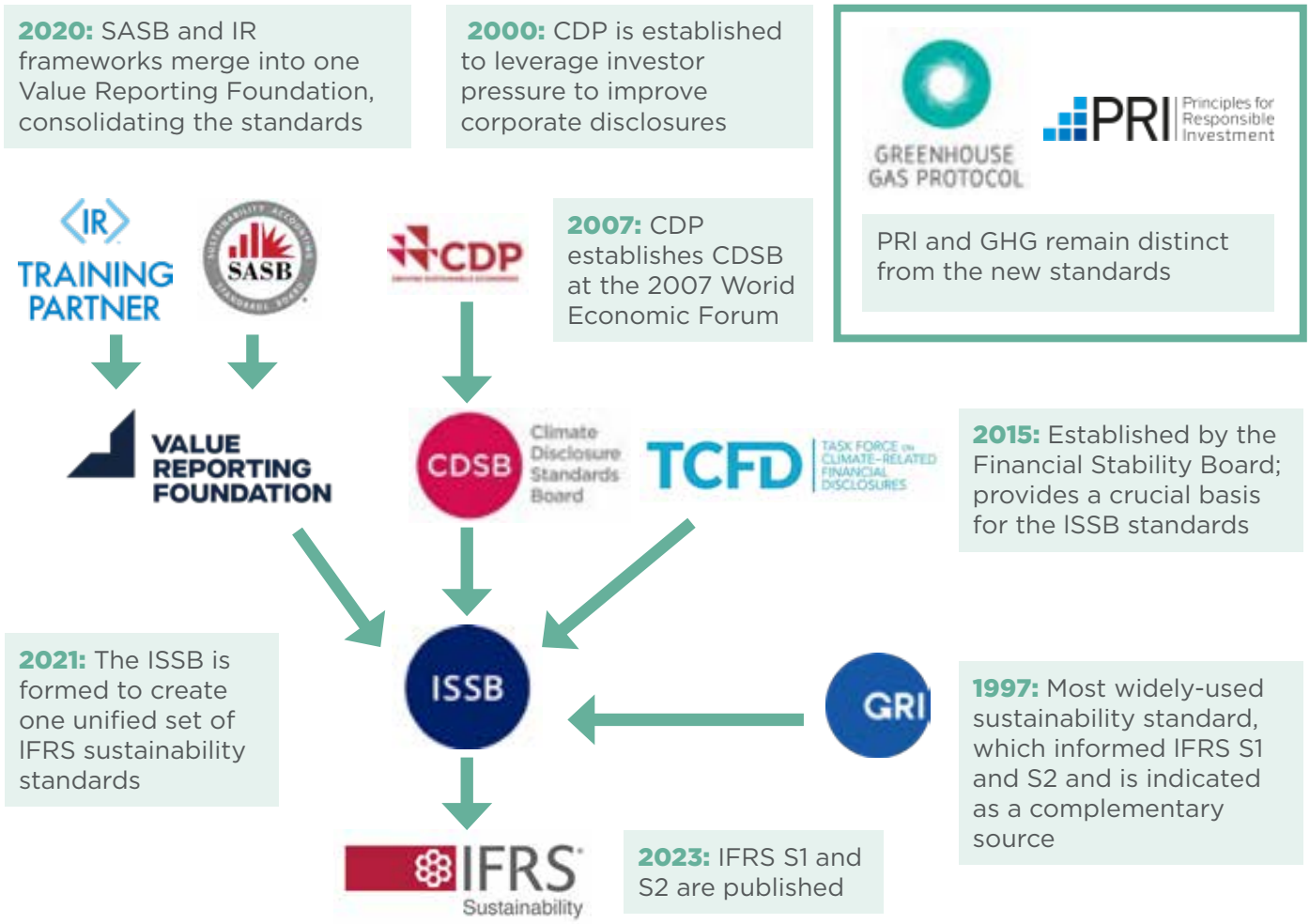
FROM REGULATION TO MEASUREMENT: A LAYERED FRAMEWORK FOR EMBODIED CARBON AND SCOPE 3

This framework illustrates how embodied carbon and Scope 3 emissions are translated from high-level regulatory disclosure requirements into robust asset-level measurement, verification, and ultimately investor benchmarking. Each layer builds on the one above it, ensuring that regulatory expectations are supported by credible technical methodologies and converted into decision-useful information for capital allocation and risk management.

STOCK EXCHANGE AND REGULATORY LAYER – HONG KONG STOCK EXCHANGE (HKEX) (ILLUSTRATIVE EXAMPLE)

For companies operating on the Chinese mainland but listed on the Hong Kong Stock Exchange, carbon disclosure expectations are defined by the HKEX ESG Reporting Code, which is now closely aligned with ISSB / International Financial Reporting Standards (IFRS) S2 and TCFD. These frameworks require disclosure of material climate-related risks, greenhouse gas emissions, and transition strategies, explicitly including Scope 3 emissions where material. (Figure 9).

Figure 9: The Evolution of Carbon Disclosure Reporting Frameworks



Source: Bloomberg, Cushman & Wakefield Research

For listed real estate companies, this brings embodied carbon directly into scope, particularly emissions associated with construction materials, development activity, capital expenditure, and tenant-related value-chain impacts.

Issuers are expected to apply recognised greenhouse gas accounting standards, such as the Greenhouse Gas (GHG) Protocol Corporate Accounting and Reporting Standard for Scope 1 and 2 emissions, and the GHG Protocol Corporate Value Chain (Scope 3) Standard where applicable. At this level, embodied carbon and Scope 3 emissions are defined by disclosure obligations rather than technical calculation, establishing materiality thresholds and system boundaries that drive subsequent measurement, verification, and benchmarking.

INTERNATIONAL ORGANISATION FOR STANDARDS (ISO) – CARBON ACCOUNTING AND CREDIBILITY

To translate regulatory expectations into auditable and investor-grade data, companies commonly adopt ISO standards as their technical foundation. ISO 14064-1 governs the quantification, documentation, and verification of greenhouse gas emissions, including Scope 3, ensuring methodological consistency and transparency. ISO 14068, which addresses carbon-neutrality claims, requires organisations to identify all material emissions, prioritise reductions, and only neutralise residual emissions (Figure 10).

At this stage, embodied carbon is formally classified as Scope 3, with clear requirements around boundary definition, data quality, assumptions, and verification, providing the credibility required for external assurance and investor confidence.

Guidance Summary: When to Use Each?

Start with ISO 14064 if you're:

- Measuring GHGs
- Building a carbon inventory
- Planning reduction strategies

Then apply ISO 14068 if you're:

- Ready to offset and achieve carbon neutrality
- Making a public claim of being carbon neutral

Figure 10: ISO 14064 and ISO 14068 and Guidance

Aspect	ISO 14064	ISO 14068
Focus	GHG quantification, validation & verification	Carbon neutrality declaration
Purpose	To measure and report greenhouse gas (GHG) emissions accurate	To guide organisation in achieving and declaring carbon neutrality
Use Case	Creating a GHG inventory, internal/ external reporting	Demonstrating carbon neutrality efforts
Output	Verified GHG emissions data	Verified carbon neutrality claim
Applicability	Organisations of all sizes and sectors	Organisations aiming to be carbon neutral
Standard Role	Supports carbon footprint-calculations and reduction tracking	Supports offsetting, reductions, and neutrality declaration
Steps	Often used before ISO 14068 to measure emissions baseline	Used after ISO 14064 to declare neutrality
Linkage	By accredited third-party auditors	By accredited bodies for neutrality assurance

Source: Cushman & Wakefield

GUOJIA BIAOZHUN/TUIJIAN (GB/T) 51366 – BUILDING LIFECYCLE CARBON EMISSION CALCULATION (THE CHINESE MAINLAND)

While national standards on the Chinese mainland do not explicitly reference Scope 3, GB/T 51366, issued by the Ministry of Housing and Urban-Rural Development, defines building-level carbon emissions across the full life cycle. It is the primary national technical methodology for quantifying emissions from material production, transportation, construction, operation, and demolition.

GB/T 51366 enables direct measurement of embodied carbon at the asset level. Emissions from building materials and upstream supply chains align closely with major upstream Scope 3 categories for real estate owners and developers, allowing project-level carbon data to be translated into Scope 3-equivalent inputs for corporate and portfolio-level carbon management.

GB/T 50378 – GREEN BUILDING EVALUATION STANDARD (THE CHINESE MAINLAND)

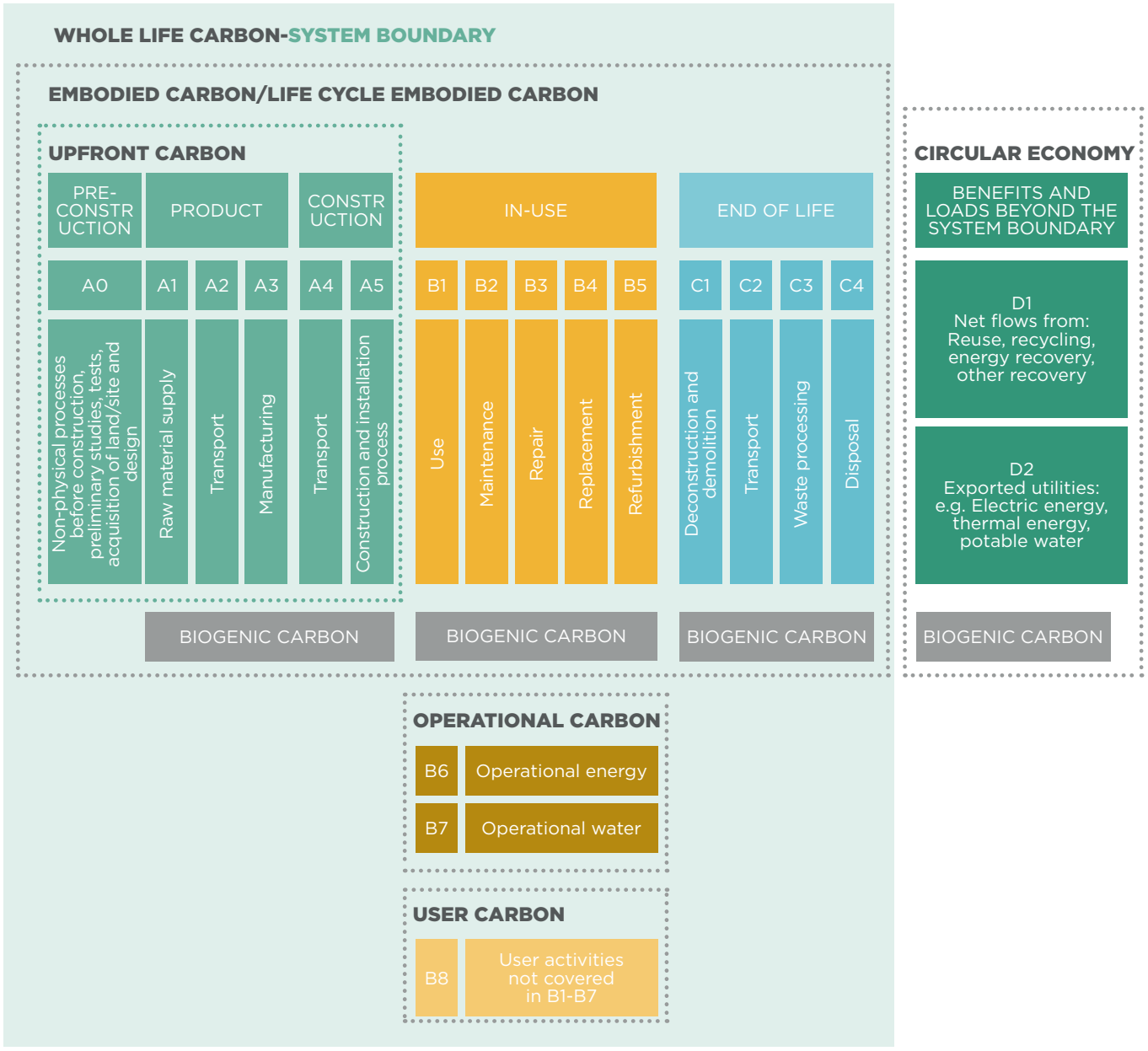
While GB/T 51366 defines how carbon emissions are calculated, GB/T 50378 defines how lifecycle and embodied carbon considerations are integrated into development practice. As the most widely implemented national sustainability framework in the Chinese mainland real estate sector, it is frequently mandated or incentivised by local governments.

GB/T 50378 does not quantify embodied carbon directly. Instead, it embeds whole-life-cycle thinking into planning, design, construction, and operation through requirements related to material efficiency, low-carbon materials, and reduced construction impacts. In practice, it functions as a primary policy and market mechanism influencing embodied-carbon outcomes, reinforcing upstream Scope 3 reductions at the asset level even without a standalone Scope 3 reporting framework.

WHOLE LIFE CARBON ASSESSMENT (WLCA) (RICS) – ASSET-LEVEL MEASUREMENT

While ISO standards define reporting requirements, WLCA, developed by RICS, defines asset-level measurement. WLCA is the leading international methodology for quantifying embodied carbon in real estate, covering materials, construction, refurbishment, maintenance, and end-of-life stages, in alignment with European Standards (Norm) (EN) 15978 (Figure 11).

Figure 11: The Modular-Structured WLCA Measurement System



Source: WLCA, Cushman & Wakefield Research

WLCA provides robust, comparable measurement of embodied carbon and captures major upstream Scope 3 categories, converting project-level carbon data into reliable inputs for corporate and portfolio-level Scope 3 reporting.

CARBON DISCLOSURE PROJECT (CDP) – STRUCTURED CARBON DISCLOSURE

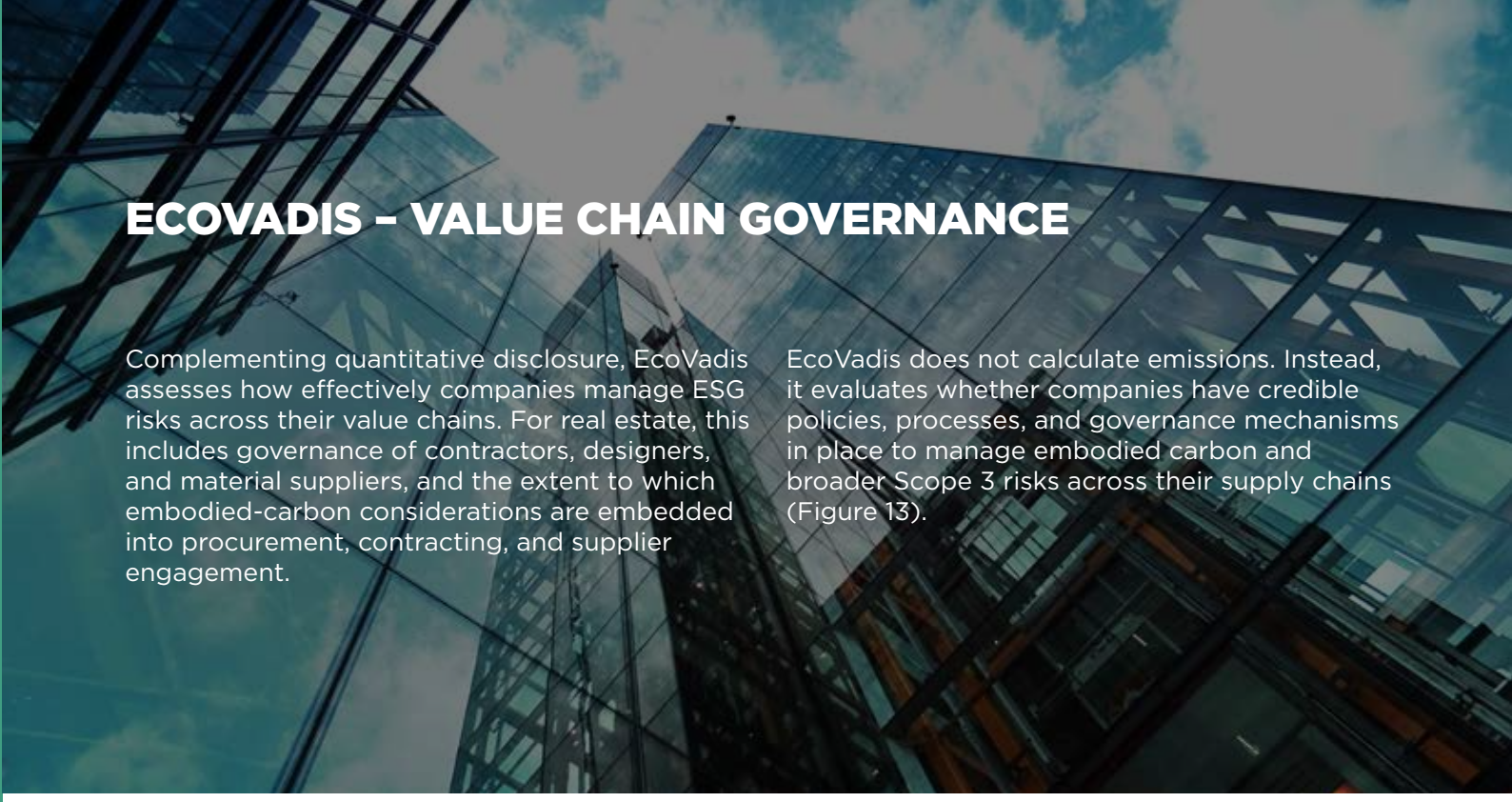
Once emissions have been measured using ISO-aligned approaches and supported by WLCA data, companies disclose this information through CDP, the leading global climate disclosure platform. CDP requires detailed reporting of Scope 1, 2, and 3 emissions, climate risks, and reduction initiatives. For real estate companies, embodied carbon is typically disclosed under Scope 3 categories such as purchased goods and services and capital goods (Figure 12).

At this stage, embodied carbon and Scope 3 emissions move from internal management to external, market-facing disclosure, where investor scrutiny increasingly focuses on data quality, targets, progress, and transparency.

Figure 12: What is CDP?

Founded	#Companies reporting	Typical audience
2000 (nonprofit)	13k+	Investors and customers who are requesting disclosure.
Purpose	**Focus**	**What is reported**
Motivate governments and companies to disclose their environmental impacts and take action to reduce them.	External environmental impacts for requesting stakeholders.	E, G - Environmental disclosures related to climate change, water security, forests and supply chain.
Who reports	**Industry-specific versions**	**Output used for**
Cities and companies responding to investor or customer request; voluntary submission.	High impact industries have additional reporting requirements.	Response to investor or customer inquiry, CDP public scoring (optional).

Source: onetrust, Cushman & Wakefield Research



ECOVADIS – VALUE CHAIN GOVERNANCE

Complementing quantitative disclosure, EcoVadis assesses how effectively companies manage ESG risks across their value chains. For real estate, this includes governance of contractors, designers, and material suppliers, and the extent to which embodied-carbon considerations are embedded into procurement, contracting, and supplier engagement.

EcoVadis does not calculate emissions. Instead, it evaluates whether companies have credible policies, processes, and governance mechanisms in place to manage embodied carbon and broader Scope 3 risks across their supply chains (Figure 13).

Figure 13: EcoVadis – The Scoring Methodology

Policies (25%)	Policies (80%)	Policies, objectives, targets, governance	0 No evidence 25 Partial 50 Confirmed 75 Advanced 100 Outstanding
	+		
	Endorsement (20%)	Endorsement of external CSR initiatives and principles, e.g. UN Global Compact	
Actions (40%)	Measures (65%)	Actions put in place to support objectives and targets	0 No evidence 25 Partial 50 Confirmed 75 Advanced 100 Outstanding
	+		
	Certifications (35%)	Certifications, labels, third-party audits	
	×		
	Coverage (35%) multiplying factor	Level of deployment of certificates or actions throughout the company	0 Not applicable 25 Low coverage 50 Medium coverage 75 High coverage 100 Very high coverage
Results (35%)	Reporting (40%)	Quality of reporting readily available to stakeholders	0 No evidence 25 Partial 50 Confirmed 75 Advanced 100 Outstanding
	+		
	360° (60%)	Standpoints of stakeholders' representatives, e.g. administrative & judicial authorities, trade unions, NGOs	0 Severe 25 Major 50 Minor 75 None 100 Positive

Source: Nexio Projects, Cushman & Wakefield Research

GRESB – INVESTOR BENCHMARKING

At the portfolio and fund level, GRESB consolidates carbon performance into an investor-focused benchmark. It rewards companies that demonstrate strong governance, credible emissions data, and measurable progress across operational carbon, embodied carbon, and Scope 3 emissions.

For many institutional investors, GRESB performance directly informs capital allocation, engagement priorities, and risk assessment, linking sustainability performance to investment outcomes (Figure 14).

Figure 14: GRESB – Providing Actionable and Transparent ESG data to Financial Markets

INSTITUTIONAL INVESTORS

Investors use GRESB data and analytical tools to monitor ESG opportunities, risks and impacts, and engage with investment managers.

GRESB ASSESSMENTS

GRESB validates, scores and benchmarks ESG performance data, providing business intelligence and engagement tools to investors and managers.

PORTFOLIOS AND ASSETS

Managers and operators complete the GRESB Assessments providing data on the ESG performance of their portfolios and assets.

Source: GRESB, Cushman & Wakefield Research

END-TO-END LOGIC FOR EMBODIED CARBON AND SCOPE 3

Taken together, embodied carbon and Scope 3 emissions progress through a clearly defined reporting and management stack on the Chinese mainland, particularly where companies are listed in Hong Kong:

HKEX sets disclosure expectations and materiality thresholds for climate-related reporting, including Scope 1, Scope 2, and material Scope 3 emissions.

ISO 14064 and ISO 14068 ensure emissions data and carbon-neutrality claims are credible and verifiable;

GB/T 50378 embeds whole-life and embodied-carbon considerations into asset planning and delivery;

GB/T 51366 provides the national methodology for measuring building-level embodied carbon and Scope 3-equivalent emissions;

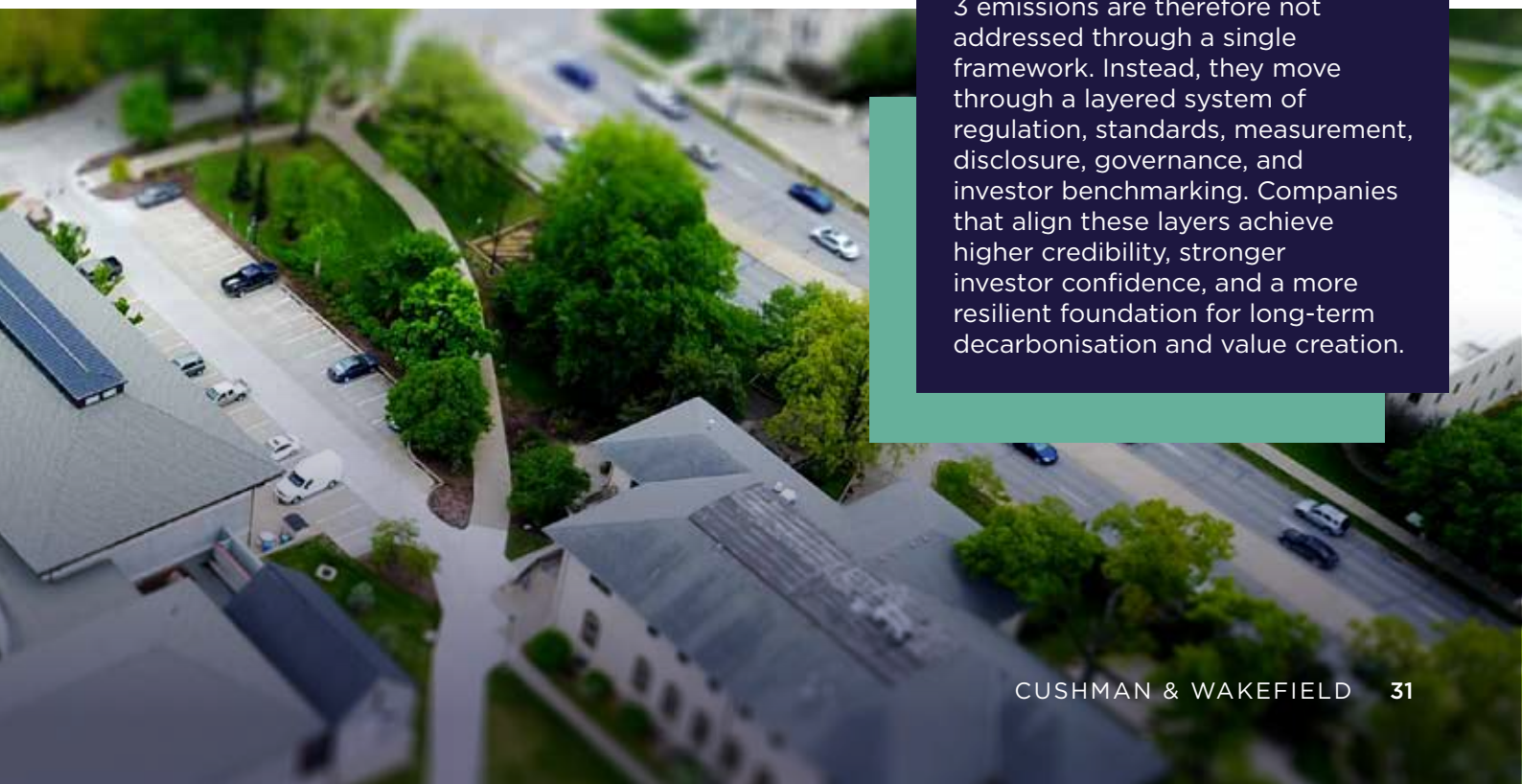
WLCA (RICS) delivers internationally recognised asset-level measurement;

CDP enables transparent market disclosure of Scope 3 emissions and climate risks;

EcoVadis assesses value-chain governance and supplier engagement, and;

GRESB benchmarks ESG performance for institutional investors.

Embodied carbon and Scope 3 emissions are therefore not addressed through a single framework. Instead, they move through a layered system of regulation, standards, measurement, disclosure, governance, and investor benchmarking. Companies that align these layers achieve higher credibility, stronger investor confidence, and a more resilient foundation for long-term decarbonisation and value creation.



APPLIED CASE STUDIES: EMBODIED CARBON AND SCOPE 3 EMISSIONS ASSESSMENT IN PRACTICE

The following case studies illustrate how embodied carbon and Scope 3 emissions can be assessed, managed and reduced in real-world commercial real estate decisions. Drawing on projects carried out by Cushman & Wakefield, these examples demonstrate practical applications across different stages of the asset lifecycle, including new development, refurbishment and asset repositioning. Together, they highlight how carbon-informed decision-making can materially influence design outcomes, capital planning and long-term asset performance.

Case Study 1
Reducing Embodied Carbon Through Structural Optimisation and Low-Carbon Procurement

Case Study 2
Carbon Footprint Assessment of Full Prefabricated Modular Data Centre

Case Study 3
LEED O+M Transportation Performance – Scope 3 Emissions

Case Study 4
Scope 3 Greenhouse Gas Emissions Accounting

Case Study 1

Reducing Embodied Carbon Through Structural Optimisation and Low-Carbon Procurement

Context

A global top-tier toy manufacturer sought to reduce the embodied carbon of a new industrial processing facility in Jiaxing, Zhejiang. The project aligned with the client's strict low-carbon targets and broader sustainability strategy. LEED v4 BD+C: NC was adopted as a practical framework to standardise embodied carbon accounting and achieve the MRc1 Building Life-Cycle Impact Reduction (Option 4) credit. Key challenges included early-stage maturity of the local supply chain in providing low-carbon material declarations and identification of carbon-intensive hotspots, including rebar, cement, concrete, and structural steel components such as trusses, purlins, and columns.

Approach

- Collaborated with structural engineers to specify high-strength steel rebars, reducing material tonnage while maintaining structural integrity.
- Integrated low-carbon requirements into the General Contractor bidding process, emphasising high-recycled content and locally produced materials. Leveraged industry EPD platforms (CISA-EPD, CNIA-EPD) to identify capable vendors and low-carbon product lines.
- Input finalised material quantities from the Construction Bill of Quantities (BOQ) into One Click LCA to verify compliance against a baseline building of equivalent size, function, and orientation.
- Coordinated closely with the General Contractor and structural engineers to align design, procurement, and construction strategies with carbon reduction goals.

Outcome

- Replaced standard cement with Supplementary Cementitious Materials (SCMs) such as fly ash and GGBS, using mixes (C35, C40) with recycled content.
- Increased recycled content in reinforcement steel rebars and structural steel profiles, columns, and beams.
- Reduced overall material weight through high-strength specifications and structural optimisation.
- Achieved full compliance with ISO 14044 and EN 15978 standards, securing targeted LEED v4 MRc1 credits.
- Delivered verified carbon savings, demonstrating the feasibility of rigorous low-carbon procurement and setting a benchmark for future industrial developments in Asia.

Case Study 2

Carbon Footprint Assessment of Full Prefabricated Modular Data Centre

Context

A leading modular data centre infrastructure company on the Chinese mainland commissioned a life cycle carbon footprint assessment for its prefabricated module products. The objectives were to quantify life cycle greenhouse gas emissions, demonstrate environmental efficiency, support decision-making for key prospective clients, and establish a comprehensive carbon inventory. The assessment was conducted in accordance with ISO 14067:2018 and PAS 2050:2011 standards.

Approach

- Collected primary data on raw materials, transport distances, and production energy use; supplemented with secondary data from public databases, literature, and verified third-party reports.
- Defined life cycle boundaries, covering raw material supply, transportation to factory, and processing.
- Calculated emissions:
  - Raw Material Supply: extraction and processing of materials
  - Transportation: supplier-to-factory delivery
  - Processing: factory production including electricity consumption
- Aligned methodology and calculations with ISO 14067:2018 and PAS 2050:2011 to ensure credibility and international compliance.

Outcome

- 30-40% Carbon reduction per sq m compared to concrete structures.
- Established a robust, internationally aligned life cycle assessment.
- Created a comprehensive carbon inventory for the product.
- Enhanced the transparency of product carbon accounting data.
- Data supports potential clients and internal sustainability planning.

Case Study 3

LEED O+M Transportation Performance – Scope 3 Emissions

Context

Transportation accounts for a significant portion of a building's environmental footprint, approximately 10–15% of a company's Scope 3 emissions. A commercial office developer on the Chinese mainland sought a robust and defensible framework for measuring and reporting occupant commuting emissions under LEED O+M v4.1. Objectives included reducing pollution, addressing gaps in transportation emissions measurement, establishing credible ESG disclosures, and supporting capital allocation and risk management. Key challenges included achieving required survey response rates, ensuring data integrity, and benchmarking against high-performing buildings globally.

Approach

- Selected Arc/LEED Online platform (or equivalent) for annual commuting surveys, with quarterly surveys recommended to capture seasonal variations. Survey boundaries included primary building occupants and relevant regular visitors.
- Applied LEED guidance to calculate minimum sample sizes using weighted occupancy formulas and tracked response rates to meet thresholds.
- Calculated route-level CO2e emissions using EPA emission factors, aggregated to individual occupants, then averaged across the project. Travel modes included driving, carpooling, public transit, alternative fuel, walking, cycling, and teleworking.
- Defined data validation rules to flag anomalies and ensure consistency and accuracy in reported emissions.
- Compiled survey responses, travel methods, distances, and frequencies into a transportation performance score report for third-party review and LEED certification submission.

Outcome

- Established a standardised, transparent CO2e methodology for occupant commuting emissions, enhancing ESG disclosure credibility.
- Supported defensible scoring for LEED O+M certification, ensuring compliance with transportation performance prerequisites.
- Created a repeatable, scalable assessment framework for annual certification cycles, providing a baseline for tracking reductions in transportation emissions over time.
- Delivered actionable insights for infrastructure improvements and occupant programmes, such as transit subsidies, bicycle facilities, and carpool matching.
- Strengthened overall Scope 3 emissions reporting capability and integrated transportation performance into corporate sustainability strategy.

Case Study 4

Scope 3 Greenhouse Gas Emissions Accounting

Context

A large domestic real estate developer and investor wanted to enhance transparency, completeness, and credibility in Scope 3 greenhouse gas emissions accounting. Objectives included providing a robust methodology for reporting indirect emissions across the value chain, improving ESG ratings, enabling green finance instruments, and demonstrating leadership in dual-carbon initiatives. Key challenges included identifying relevant emissions categories, selecting appropriate emission factors, and ensuring high-quality, auditable data.

Approach

- Mapped and prioritised relevant Scope 3 categories, verifying activity data and emission factor availability.
- Selected assumptions and emission factors for each category; Scope 3 emissions calculated as:

  GHG emissions = Activity data × Emission factor × Global Warming Potential (GWP)
- Developed customised data collection templates for each asset, enabling efficient activity data gathering and preliminary screening.
- Calculated Scope 3 emissions for the company, ensuring consistency and alignment with operational control principles.
- Produced a detailed methodology report documenting boundaries, data sources, assumptions, and emission factors to ensure transparency and auditability.

Outcome

- Established a systematic and credible framework for Scope 3 emissions disclosure.
- Strengthened ESG ratings and investor confidence, including MSCI, S&P CSA, and GRESB performance.
- Provided a solid data foundation for green finance instruments, such as green bonds and sustainability-linked loans.
- Demonstrated strategic leadership in dual-carbon initiatives, enhancing corporate social responsibility and promoting green building premiums and improved property service performance.

DATA ASSURANCE AND CONFIDENCE IN EMBODIED CARBON & SCOPE 3 METRICS

As embodied carbon and Scope 3 emissions become material to investment decisions, financing, and corporate disclosure, the quality and assurance of underlying data is increasingly critical. Unlike operational emissions, these metrics rely on a combination of primary data, secondary datasets, and proxy assumptions, making transparency and methodological consistency essential.

A structured data quality and assurance approach aligned with leading market practice and the GHG Protocol should include these key principles:

- A clear differentiation between primary, secondary, and proxy data sources;
- Transparent documentation of assumptions, system boundaries, and emission factors;
- Consistent calculation methodologies to support comparability across assets and scenarios, and;
- An internal quality review to enhance robustness, consistency, and audit readiness.

While full third-party assurance is not yet universally required for embodied carbon and Scope 3 emissions, the methodologies and datasets used should be designed to be assurance-ready, supporting future external verification, regulatory disclosure, and investor scrutiny as standards continue to evolve.

Case Study 5
Enhancing Data Integrity and Assurance Readiness in ESG Reporting

Case Study 5

Enhancing Data Integrity and Assurance Readiness in ESG Reporting

Context

A diversified property investment fund sought independent assurance over environmental data across its multi-country portfolio to strengthen investor reporting and GRESB participation. The portfolio included office, retail, and industrial assets with varying metering arrangements, data access levels, and property management practices. Utility data was sourced from landlord meters, third-party managers, and tenants, resulting in gaps, inconsistent formats, and uneven data quality. The client required AA1000AS v3-aligned assurance for energy, GHG emissions, water, and waste data to enhance confidence in portfolio-level ESG disclosures.

Approach

- Developed a detailed assurance plan defining boundaries, timelines, and assurance levels in collaboration with the client's sustainability and operations teams.
- Customised a data collection checklist aligned with AA1000AS v3 principles, covering energy, GHG emissions, water, and waste indicators.
- Collected and tested supporting evidence – including meter readings, invoices, and third-party reports – for completeness and consistency.
- Conducted variance analyses on monthly and annual consumption trends, supplemented by interviews to validate data sources and clarify anomalies.
- Documented findings and improvement areas to form the basis of an independent assurance statement, endorsed with the AA1000AS v3 accreditation.

Outcome

- Delivered an independent assurance statement covering portfolio-level environmental indicators, enhancing credibility for investors, lenders, and stakeholders.
- Verified ESG metrics were reported with clearly defined boundaries, assumptions, and levels of assurance.
- Resolved data discrepancies, improving both accuracy and transparency of reported results.
- Strengthened understanding of data usage across the portfolio, enabling improved management practices and identification of opportunities to reduce energy, water, and waste consumption.

6 Regulatory and Policy Direction: The Chinese Mainland and Global Alignment

As attention on embodied carbon accelerates globally, the Chinese mainland is beginning to signal a more explicit policy focus on lifecycle emissions in the built environment. While operational energy efficiency and industrial decarbonisation remain core priorities, market participants are increasingly required to navigate a dual context: evolving domestic policy signals alongside the expectations of global capital and internationally recognised ESG frameworks.

THE EVOLVING POLICY LANDSCAPE ON THE CHINESE MAINLAND

The Chinese mainland's decarbonisation agenda has historically prioritised energy efficiency, operational performance, and industrial emissions, reflecting the scale of emissions reductions achievable through these channels. Within the built environment, this has translated into a strong focus on operational energy use and building efficiency standards.

However, embodied carbon is gaining increasing policy attention, particularly through adjacent policy mechanisms rather than explicit caps. These include the continued evolution of green building standards, pilot low-carbon city initiatives, and broader construction sector decarbonisation strategies. Together, these initiatives are shifting the policy conversation beyond operational performance towards earlier-stage design and construction decisions (Figure 15).

Figure 15: Policy Drivers Influencing Embodied Carbon on the Chinese Mainland

General

- Energy Efficiency
- Operational Performance
- Industrial Emissions

Real Estate

- Operational Energy Use
- Building Efficiency Standards

Now beginning to focus on Embodied Carbon

Source: Cushman & Wakefield Research

Although explicit regulatory limits on embodied carbon are not yet widespread, policy signals increasingly favour building reuse over demolition, material efficiency, and lifecycle-based decision-making. These signals align closely with whole-life carbon principles and are expected to strengthen as carbon management moves upstream in the development process.

GLOBAL CAPITAL AS A REFERENCE FRAMEWORK

Alongside domestic policy evolution, global capital is playing a critical role in shaping embodied carbon practices on the Chinese mainland. Assets held within international portfolios are increasingly assessed against globally recognised ESG and climate frameworks, which serve as reference points for both performance evaluation and disclosure.

Global investors typically emphasise established disclosure practices, internationally recognised ESG frameworks, and long-term decarbonisation and net-zero pathways. In this context, embodied carbon and Scope 3 emissions are increasingly viewed as indicators of transition risk, asset resilience, and long-term value.

For Chinese mainland-based assets, these frameworks support comparability, transparency, and consistency across markets, while still allowing for alignment with local regulatory conditions, development stages, and policy priorities. As a result, global benchmarks and disclosure platforms are increasingly influencing domestic market behaviour, even in advance of formal regulation.

PREPARING FOR FUTURE REGULATION

In response to these converging domestic and global signals, forward-looking market participants are already taking proactive steps to integrate embodied carbon considerations into project planning and asset management. These include embedding whole-life carbon assessment into internal approvals, tracking embodied carbon intensity metrics, and engaging supply chains early in the design and procurement process.

Such actions position assets to respond quickly to future regulatory requirements, maintain access to global capital, and avoid disruptive and costly retrofits as embodied carbon expectations continue to tighten. More broadly, they reflect a shift from compliance-driven reporting towards strategic carbon management, supporting both decarbonisation objectives and long-term asset competitiveness.

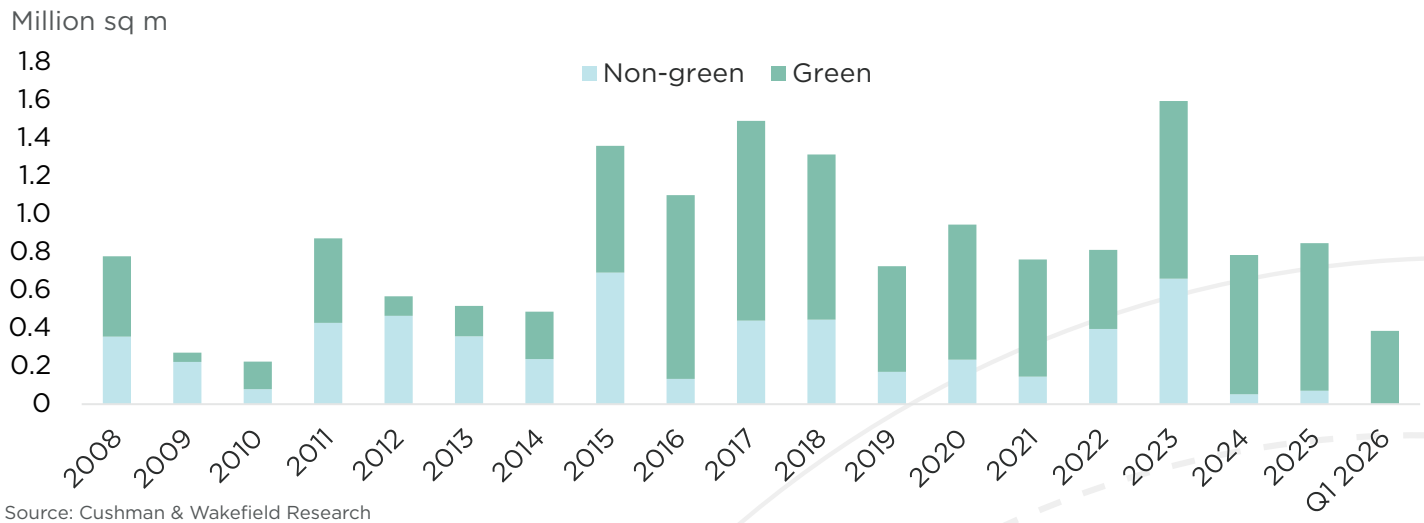
7 Market Implications for Leasing, Capital Markets, Asset Value and Exit Strategies

Embodied carbon and Scope 3 emissions are increasingly shaping tenant demand, capital market behaviour, asset valuation, and exit outcomes. Stakeholders who ignore these factors risk financial, operational, and reputational consequences, particularly as disclosure expectations and investor scrutiny intensify.

LEASING AND TENANT DYNAMICS

Occupiers now actively consider both operational and embodied carbon in their office selection decisions, and this is clearly demonstrated in the Shanghai Grade office market where a greater proportion of green certified buildings have been completed over recent years (Figure 16).

Figure 16: Shanghai Grade A Office Supply – Green and Non-Green GFA (2008-Q1 2026)



Source: Cushman & Wakefield Research

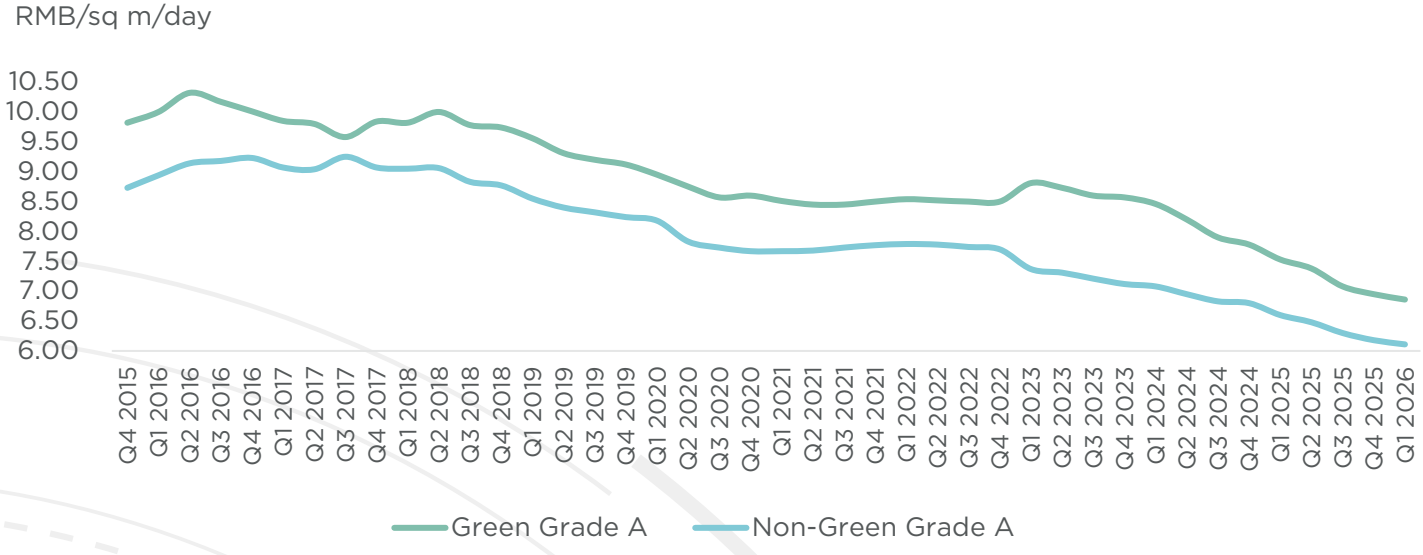
Today, on the Chinese mainland, many multinational favour buildings with green certifications, transparent lifecycle carbon data, and sustainable fit-out options, while local corporates are increasingly influenced by ESG-driven investor expectations and market reputation. Technology and life sciences tenants are especially sensitive to low-carbon design due to global reporting requirements.

Buildings that can demonstrate credible whole-life carbon performance often face:

- Shorter vacancy periods;
- Stabilised rent, and;
- Reduced risk of losing anchor tenants.

These dynamics highlight the growing intersection between sustainability performance and core leasing competitiveness, which again is clearly demonstrated by the rental premium enjoyed by those green certified buildings in the Grade A office market in Shanghai when compared to those non-green certified buildings (Figure 17).

Figure 17: Shanghai – The Average Green Grade A Office Rental Compared to the Average Non-Green Grade A Office Rental (Q4 2015-Q1 2026)

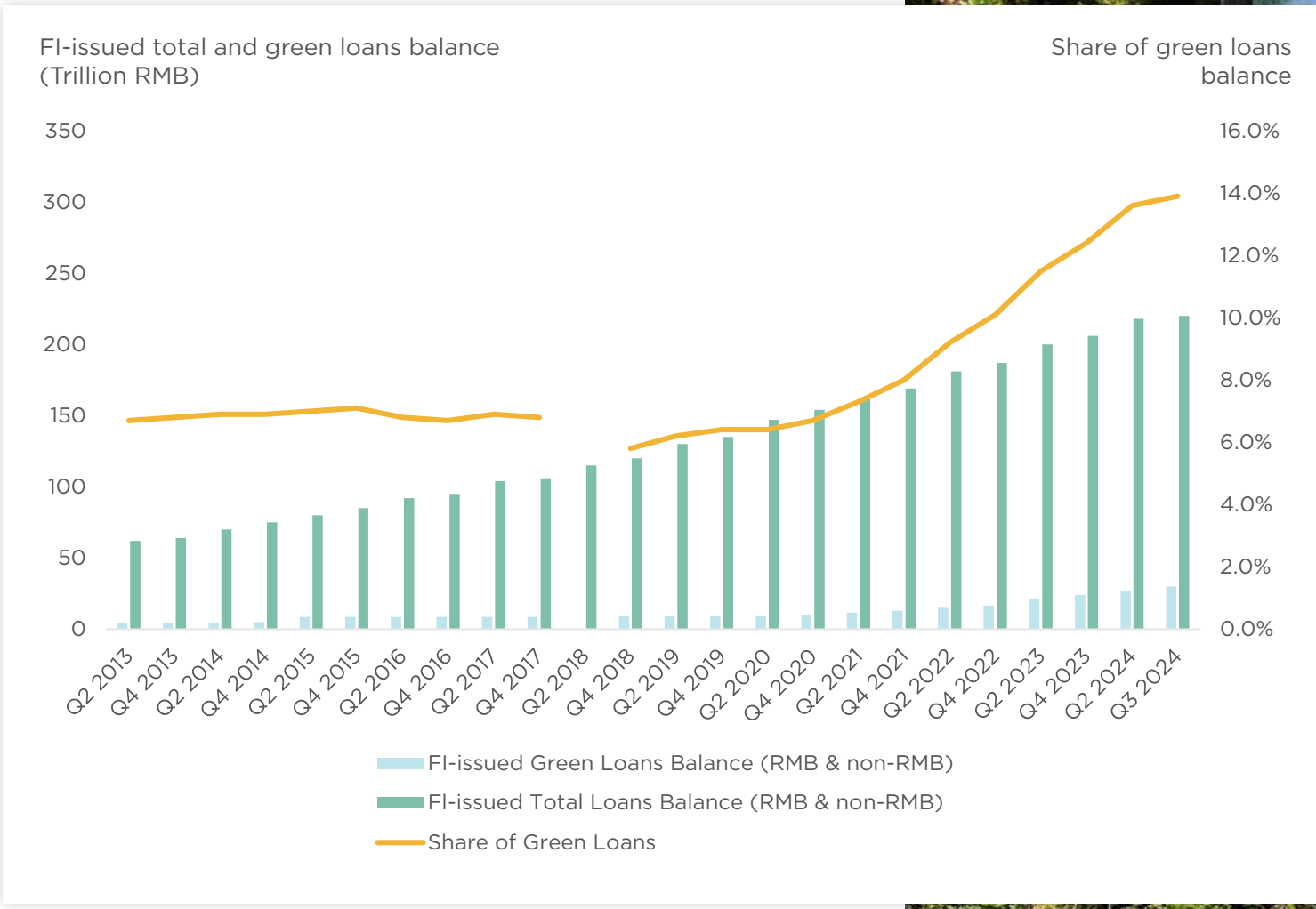


Source: Cushman & Wakefield Research

CAPITAL MARKET AND FINANCING IMPLICATIONS

Capital markets are increasingly embedding lifecycle carbon metrics into investment and financing decisions. Green finance instruments, including green bonds and sustainability-linked loans and where the overall volume of financing is increasing on the Chinese mainland, often require quantified reductions in embodied or Scope 3 emissions (Figure 18).

Figure 18: The Chinese Mainland – Green Loans and Total Loans Balance (2013-2024)



Source: PBoC public reports (Includes 21 banks), Griffith University, Cushman & Wakefield Research

Key mechanisms include:

- Portfolio-level ESG compliance influencing capital allocation;
- Lower-carbon assets attracting more favourable insurance and underwriting terms, and;
- Use of carbon performance as a criterion in risk assessment and pricing.

These developments demonstrate that embodied carbon management is no longer a peripheral sustainability consideration but a material factor in access to capital and financing costs.

IMPACT ON ASSET VALUATION AND EXIT OUTCOMES

Sustainability and carbon performance are increasingly influencing commercial real estate value across the Chinese mainland, particularly in gateway cities such as Shanghai. As occupiers – especially multinational corporations and technology firms – prioritise ESG-aligned space, and as investors integrate climate risk into underwriting, carbon performance is emerging as a key differentiator in office asset pricing.

This simplified example illustrates how two otherwise identical Grade A office assets can diverge significantly in value purely due to differences in whole-life carbon performance. The analysis isolates three key transmission mechanisms:

- Income effects (rent premiums or discounts);
- Cost impacts (operating efficiency and capital expenditure), and;
- Capitalisation rates (risk perception and investor demand).

Core Assumptions (Both Assets)

Location: Core Shanghai CBD

Net Lettable Area: 50,000 sq m

Average Market Rent (headline): RMB 7.69 / sq m / day

Occupancy (stabilised): 90%

Holding period: 10 years

Exit valuation: Based on capitalisation of Year-11 NOI

Base Rental Calculation

Annual Gross Rental Income (GRI):
= RMB 126.3 million

This serves as the starting point for both assets before ESG-related adjustments.

Asset A: Carbon-Intensive Grade A Office

(Legacy systems, high embodied carbon, weak operational performance, no credible decarbonisation pathway)

Carbon-Related Impacts

- Higher energy and water consumption
- Near-term retrofit requirements
- Reduced appeal to ESG-driven occupiers
- Higher perceived transition and obsolescence risk

Step 1: Income Adjustment (ESG Discount)

Effective rent discounted by a conservative 3%:
Effective Gross Income = RMB 122.5 million

Step 2: Net Operating Income (NOI)

Adjustments:
Operating costs: +15% vs benchmark
Capex: RMB 25 / sq m annually

Annual capex:
Assuming a compressed NOI margin due to higher opex and capex:
NOI ≈ RMB 82 million

Step 3: Exit Valuation

Exit yield reflects higher risk premium:
= RMB 1.56 billion

Source: Cushman & Wakefield Research

Asset B: Low Whole-Life Carbon Grade A Office

(High-performance systems, low embodied carbon, strong operational data, credible net-zero pathway)

Carbon-Related Advantages

- Lower energy intensity and operating costs
- Strong demand from multinational and tech occupiers
- Access to green finance and broader investor pool
- Lower transition and obsolescence risk

Step 1: Income Adjustment (ESG Premium)

Effective rent increased by a conservative 3%:
Effective Gross Income = RMB 130.1 million

Step 2: Net Operating Income (NOI)

Adjustments:
Operating costs: –10% vs benchmark
Capex: RMB 10 / sq m annually

Annual capex:
Assuming improved NOI margin due to efficiency:
NOI ≈ RMB 101 million

Step 3: Exit Valuation

Exit yield reflects stronger investor demand and lower risk:
= RMB 2.13 billion

Valuation Comparison

Metric	Asset A (Carbon-Intensive)	Asset B (Low Carbon)
Gross Income (post ESG adj.)	RMB 122.5m	RMB 130.1m
NOI	RMB 82m	RMB 101m
Exit Yield	5.25%	4.75%
Capital Value	RMB 1.56bn	RMB 2.13bn

Key Insight

Value Differential:
~RMB 570 million (~37%)

Despite identical fundamentals (location, size, age), carbon performance alone drives a substantial divergence in value.

Conclusion

This example demonstrates that carbon performance is no longer a secondary consideration, but a core financial driver of office asset valuation. Its impact is transmitted through three reinforcing channels:

Income
ESG-aligned buildings capture rental premiums and stronger occupancy resilience

Costs
Efficient buildings benefit from structurally lower operating expenses and reduced capital expenditure

Capitalisation Rates
Investors apply lower yields to assets with reduced transition risk and stronger liquidity

8 Strategies to Reduce Embodied Carbon and Scope 3 Emissions

Mitigating embodied carbon and Scope 3 emissions requires coordinated action across design, development, supply chain, tenant engagement, and governance.

DESIGN AND MATERIALS STRATEGIES

Early-stage design and material selection are critical to reducing embodied carbon. Strategies include:

- Material substitution (low-carbon concrete, recycled steel, cross-laminated timber);
- Optimised structural design to reduce material use without compromising safety, and;
- Prefabrication or modular construction to minimise waste and improve quality control.

RETENTION, REFURBISHMENT AND ADAPTIVE REUSE

Retaining and upgrading existing structures can deliver significant carbon reductions while maintaining asset value (Figure 20). Key approaches include:

- **Deep retrofits:** Upgrading building systems while retaining structural elements;
- **Adaptive reuse:** Repurposing obsolete assets for new functions, particularly in urban regeneration projects.

These measures often result in lower capital expenditure than full redevelopment and enhance tenant and investor appeal.

SUPPLY CHAIN ENGAGEMENT

Scope 3 emissions are largely embedded upstream, making supplier collaboration essential. Effective practices include:

- Early-stage carbon assessment of material suppliers;
- Transparent reporting of upstream emissions, and;
- Encouraging low-carbon logistics and procurement practices (Figure 19).

Figure 19: Scope 3 Emission Reduction Pathway Through Supply Chain Engagement

1 Establish Scope 3 baseline

Establish the source of your Scope 3 emissions. Utilise tools that leverage average industry data - perfection may not be realistic to begin with.

2 Engage with suppliers

Build a strong and collaborative relationships with suppliers. Gather information about suppliers' current emissions practices but also explore potential reduction strategies and opportunitie.

3 Set goals & milestones

Goals give you a direction to focus your attention and should hold you accountable. They should also be aligned with your company's mission, vision, and long-term strategy.

4 Communicate expectations and provide support

Keep in touch with your suppliers to learn how things are progressing, offer training, tooling, or financing to help them.

5 Monitor and report your progress

Periodically check in on how the numbers are looking and report on a regular basis to demonstrate change.

Example strategies

Offer training courses on sustainability topics, such as ways to optimise processes or install low carbon technologies.

Provide tooling, or awareness of third parties who can help them, such as the SBTi.

You may need to invest in their sustainability efforts to get them started, this can pay off in the long run.

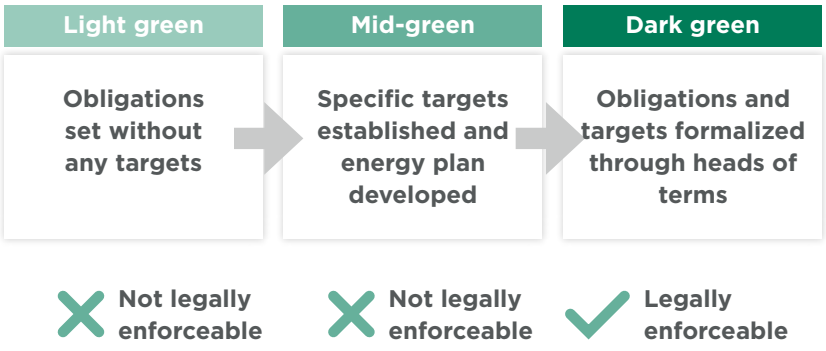
Source: Sustainability News, Cushman & Wakefield Research

TENANT ENGAGEMENT AND GREEN LEASES

Tenants are both a source of emissions and critical partners in carbon reduction. Leading practices include:

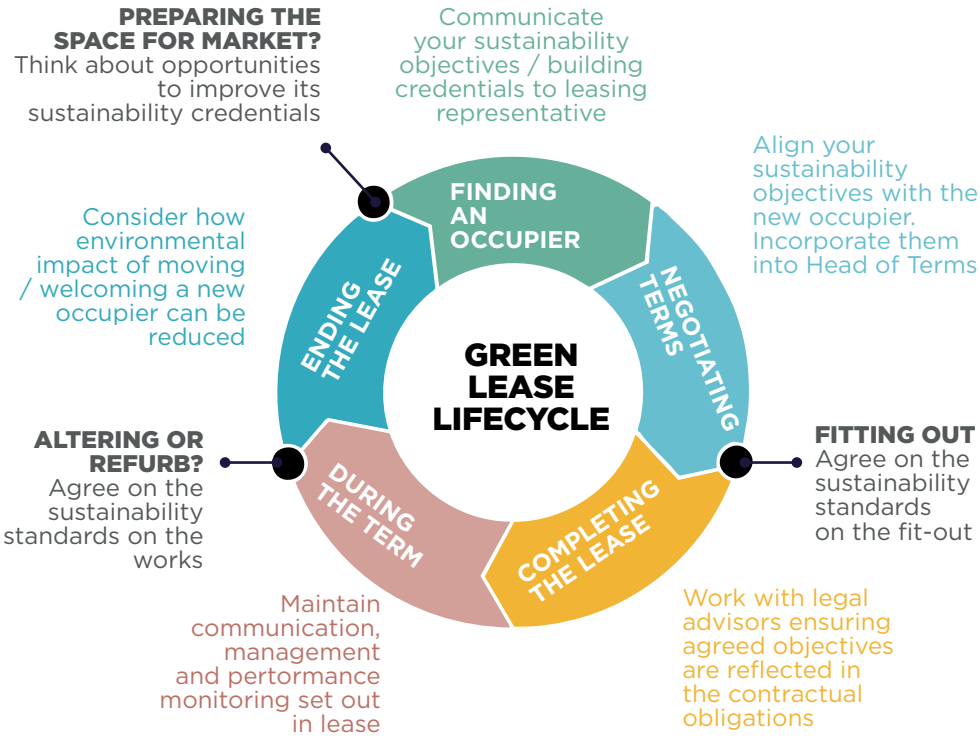
- Green leases incorporating energy efficiency, sustainable fit-out materials, and shared carbon targets (Figures 20 and 21);
- Tenant awareness programmes providing dashboards and benchmarking tools, and;
- Operational collaboration to optimise whole-building carbon performance.

Figure 20: Shades of Green Leases



Source: designingbuildings.co.uk, Cushman & Wakefield Research

Figure 21: The Landlord's Perspective – The Green Lease Cycle



Source: Better Buildings Partnership, Cushman & Wakefield Research

PORTFOLIO-LEVEL GOVERNANCE AND REPORTING

Robust governance ensures carbon reduction strategies are measurable, consistent, and integrated into broader business decisions. Effective frameworks typically include:

- Carbon accounting at both portfolio and asset levels;
- Tracking progress against science-based targets, and;
- Integrating whole-life carbon considerations into investment, asset management, and exit decisions.

Through these mechanisms, stakeholders can translate operational and design-level interventions into measurable outcomes, supporting long-term value preservation and resilience in an increasingly carbon-constrained market.

Conclusion

The Chinese mainland commercial property sector is entering a new era:

Operational efficiency alone is insufficient. Embodied carbon and Scope 3 emissions dominate lifecycle footprints.

Market forces are aligning. Investors, tenants, and financiers increasingly treat whole-life carbon performance as financially material.

Early action drives competitive advantage. Adaptive reuse, low-carbon materials, and green leases enhance both valuation and marketability.

Data and governance gaps remain. Measurement challenges exist but are no longer a barrier to action; transparency and methodology evolution are critical.

Policy and capital will continue to converge. Even in the absence of explicit regulations, global capital expectations effectively enforce lifecycle carbon scrutiny.

FORWARD OUTLOOK

Companies and investors that embed whole-life carbon thinking into every stage – from design to leasing to disposal – will outperform peers in the new low-carbon market environment.

Lifecycle carbon strategies will increasingly determine tenant retention, financing options, asset value, and exit flexibility.

Tier 1 and Tier 2 cities on the Chinese mainland, given rapid redevelopment cycles, are particularly exposed – but also offer the greatest opportunity for measurable impact.

The message is clear: beyond operational metrics, the future of commercial real estate on the Chinese mainland will be defined in part by how well the sector addresses embodied carbon and Scope 3 emissions. Forward-thinking stakeholders in the region who act now will not only manage risk – they will create tangible, long-term value.

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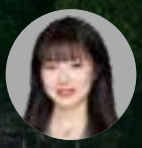

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BEYOND THE CARBON BLIND SPOT

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