KARBUNWISE™



The 2026 Embodied Carbon Playbook for Project Developers and Asset Owners

What Every Real Estate Developer, Architect, and Asset Owner Needs to Know About LEED v5 and Whole-Building Life Cycle Assessment

Why embodied carbon data is becoming essential for compliance, capital access, and competitive positioning in the built environment.

A KarbunWise Industry Playbook

KARBUNWISE™

The Leading Product Carbon Platform for the Built Environment

KarbunWise helps developers, asset owners, and design teams build, manage, and scale Whole-Building Life Cycle Assessments (WBLCAs) with precision and confidence.

As embodied carbon assessment becomes a prerequisite under LEED v5 and a planning condition across India, UK, UAE, and Australia, project teams need more than fragmented spreadsheets and one-off consulting engagements. They need a system designed to make carbon data structured, auditable, and decision-ready from concept design through procurement.



KarbunWise enables project teams to:

- Build WBLCAs aligned with **IGBC, RICS Whole Life Carbon Assessment, ISO 14067, and LEED v5 methodologies**
- Capture emissions data across **materials, structural systems, facades, MEP, and finishes**
- Improve **EPD coverage and supplier carbon transparency**
- Respond faster to **certification, procurement, and investor carbon requests**
- Scale carbon reporting across **multiple projects, asset classes, and markets**

From LEED v5 prerequisites to capital-market disclosures and decarbonization strategy, KarbunWise helps real estate organizations turn embodied carbon data into a repeatable business capability.

Discover KarbunWise

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CEO Statement

From Reporting Burden to Capital Discipline

Over the last few years, carbon performance in the built environment has changed fundamentally. Developers and asset owners are no longer being asked only how efficiently a building will operate. Increasingly, they are being asked to quantify the carbon impact of the building itself, at the level of structure, facade, MEP systems, and individual materials, long before operations begin.

Embodied carbon is no longer a sustainability metric. It is a capital decision, and this shift changes the role carbon data plays inside a real estate business. It affects design decisions, influences procurement, shapes capital access, and increasingly determines which projects get built, how they are valued, and which developers remain competitive in carbon-sensitive markets.

The organizations that will lead in this next phase are not those with the strongest sustainability messaging. They are the ones that build carbon data systems capable of handling complexity repeatedly, accurately, and at scale, from concept design through procurement and into operation.

This playbook was created to help project developers, asset owners, and design teams understand what is changing in 2026, why it matters now, and how to prepare with confidence.



Arjun Vijayaragavan
CEO, KarbunWise

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This playbook is designed to help developers, asset owners, and design teams understand not only what is changing in embodied carbon accountability, but how to respond with speed, confidence, and competitive advantage.

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01

The LEED V5 Transition Embodied Carbon, WBLCA, And The Whole-Lifecycle Mandate

The Decision That Is Already Made Before the Building Opens

By the time concrete is poured and structural steel is set, roughly half of a building's lifetime carbon emissions have already been committed. They are embedded in the materials, the supply chains, and the structural decisions made months before site mobilisation. They cannot be retrofitted, optimised, or offset out later in the lifecycle.

This is the single most consequential idea reshaping green building certifications today, and it is the reason LEED v5 marks a structural break from more than a decade of operational-first thinking. For developers, asset owners, and capital allocators, the implication is direct: carbon performance is no longer a post-occupancy reporting exercise. It is a design-stage capital decision with measurable consequences for compliance, valuation, and access to financing.

Whole-Life Carbon Reality

***40 to 60 percent** of a new building's total lifecycle emissions are typically locked in at the design and procurement stage, before the building is ever occupied.*



02

The Problem: The Operational-Only Blind Spot



For more than a decade, green building strategy was shaped almost entirely by what happened after a building came online. Energy efficiency, water use, indoor environmental quality, and operational carbon defined the certification logic of LEED v4 and v4.1, along with most parallel frameworks globally. These priorities delivered measurable gains. Operational efficiency improved, renewable procurement scaled, and indoor environments became healthier.

But a significant blind spot remained. The carbon associated with construction materials and building systems was treated as background information, captured loosely under material transparency credits and rarely benchmarked with the same rigour as kilowatt-hours.

The result is a structural mismatch. As buildings became more energy efficient and grids decarbonised, operational emissions per square metre dropped. Embodied emissions did not. The relative share of carbon locked into materials grew, even as the absolute carbon profile of the building improved. In short, the industry optimised the smaller half of the equation while leaving the larger, less visible half largely unmeasured.

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The Shift: Why Embodied Carbon Moved From Footnote To Mandate

The repositioning of embodied carbon is not a soft trend. It is being forced into the spotlight by a convergence of regulatory, financial, and data-capability pressures that are now reinforcing one another.

Regulatory pressure is moving from voluntary to mandatory



In the UK and parts of the EU, Whole Life Carbon assessments are now required for new developments. London has introduced embodied carbon limits per square metre as a condition of planning approval, tying material specifications directly to whether a project can be built. Similar trajectories are emerging across other jurisdictions.

Capital markets are pricing in carbon transparency



ESG-linked finance, GRESB ratings, and SFDR disclosure rules now demand measurable, auditable carbon reporting. Because embodied carbon can represent the majority share of a building's footprint, it is increasingly material to investment screening and asset valuation, cost of capital and debt pricing, and portfolio-level Scope 3 disclosure for institutional owners.

Net-zero commitments expose the materials gap



Operational decarbonisation is largely addressable through efficiency and renewables. Scope 3 emissions from construction materials are not. As corporates and institutional investors close in on net-zero deadlines, the unaddressed embodied carbon in their construction pipelines becomes the single largest remaining gap.

Data infrastructure has finally caught up



Environmental Product Declarations (EPDs), life cycle assessment tools, and BIM-integrated carbon platforms have made material-level carbon measurable and comparable. What was once a qualitative argument is now a quantitative input.

03

The Shift: Why Embodied Carbon Moved From Footnote To Mandate

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The Solution: LEED V5 And The Whole-Lifecycle Mandate

LEED v5 reflects this structural shift in framework logic. Operational performance remains foundational, but the certification now places equivalent weight on embodied carbon, lifecycle carbon assessment, refrigerant emissions, and transportation-related impacts.

LEED v4/v4.1 versus LEED v5: The substantive differences

Dimension	LEED v4/v4.1	LEED v5
Primary focus	Operational efficiency and material transparency	Decarbonisation, resilience, and lifecycle performance
Carbon scope	Operational carbon with optional lifecycle credits	Operational, embodied, refrigerant, and transport emissions treated together
Materials approach	EPDs, responsible sourcing, lifecycle credits	Lower-carbon procurement tied directly to lifecycle outcomes
Performance tracking	Operational monitoring, documentation-based	Continuous linkage across design, construction, and operations
Lifecycle assessment	Available within materials credits	Central to certification logic
Strategic direction	Performance optimisation	Whole-life carbon reduction and long-term resilience

The most consequential change is not any single credit. It is the structural continuity LEED v5 draws between design-stage decisions and long-term building performance. Material selection, lifecycle assessment, carbon reporting, and procurement strategy are now treated as a continuous decision chain rather than as separate workstreams.

Where WBLCA fits

Whole-Building Life Cycle Assessment (WBLCA) is the analytical backbone of this shift. Aligned with EN 15978, WBLCA quantifies environmental impacts across every stage of a building's life:

Lifecycle Stage	Scope
Product (A1-A3)	Raw material extraction and manufacturing
Construction (A4-A5)	Transport to site and on-site construction activities
Use (B1-B7)	Maintenance, repair, replacement, operational energy, operational water
End-of-life (C1-C4)	Demolition, transport, waste processing, disposal
Module D (optional)	Benefits and loads beyond the system boundary, including reuse and recovery

WBLCA gives project teams the ability to compare structural systems, facade options, and material specifications on the basis of verified carbon data. It is the mechanism that converts embodied carbon from a reporting concept into a design input.

The framework convergence

LEED is not moving alone. The direction is consistent across major regional frameworks, which matters significantly for multi-jurisdictional portfolios:

Framework	LEED v5	IGBC	BREEAM	GRIHA
Lifecycle and Carbon Focus	Building Life-Cycle Impact Reduction, embodied carbon reduction, lifecycle-based performance	Whole Life Carbon Assessment considerations within certification pathways	Whole Life Carbon and lifecycle impact reduction credits across multiple categories	Lifecycle-focused credits across materials, resource efficiency, and environmental impact

The data infrastructure required to satisfy one framework increasingly serves all of them. Portfolio operators who build this capability once can deploy it across geographies.

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Embodied Carbon As A Capital And Risk Decision



Once embodied carbon is recognised as a design-stage commitment, the conversation shifts from compliance to optimisation. The reduction levers that consistently produce measurable results all depend on decisions made before procurement is locked.

Design strategies now focus on reducing reliance on high-carbon materials such as cement, steel, glass, and aluminium while maintaining structural performance and long-term asset value.

Designing Material Systems For Lower Carbon Impact

Embodied carbon reduction depends on decisions made before procurement begins. Lower-carbon concrete, recycled metals, mass timber, and retrofit strategies can significantly reduce lifecycle emissions while maintaining long-term building performance. EPD and GWP data are now becoming standard procurement criteria across material selection workflows.

Retaining and adapting existing structures avoids the most carbon-intensive phase of construction: new material production.

Materials are increasingly evaluated on cost, performance, and carbon intensity as a single integrated specification. Environmental Product Declarations (EPDs) and Global Warming Potential (GWP) data are now standard supplier evaluation criteria across procurement workflows. For many portfolios, retrofit is becoming the highest-leverage decarbonisation decision available.

06

The Future: Carbon Performance Is A Data Infrastructure Problem



Once embodied carbon is recognised as a design-stage commitment, the conversation shifts from compliance to optimisation. Three reduction levers consistently produce measurable results, and all three depend on decisions made before procurement is locked.

Consider what is involved on a single project: thousands of line items in a specification, each with potentially multiple EPDs, multiple suppliers, and multiple GWP values depending on plant of origin and production date; iterative design changes through concept and schematic stages, each of which alters the carbon profile of the structure; procurement decisions that must reconcile cost, lead time, performance, and embodied carbon simultaneously; and reporting obligations spanning LEED, BREEAM, IGBC, GRESB, SFDR, and internal Scope 3 targets, all drawing from the same underlying material data.

Manual approaches break at this scale. Spreadsheet-based tracking cannot keep pace with iterative design cycles, nor can it surface optimisation opportunities in time to influence early-stage decisions, which is precisely the window in which embodied carbon is most reducible.

What this shift demands is a different category of capability: predictive and prescriptive carbon intelligence, integrated directly into design and procurement workflows. In practice, that means automated ingestion and normalisation of EPD and material data at portfolio scale, real-time carbon impact modelling as design options change, scenario comparison across structural systems and material substitutions, direct linkage between design-stage carbon budgets and procurement specifications, and certification-ready reporting that maps to LEED v5, WBLCA standards, and parallel frameworks without rework.

Project teams that build this data infrastructure now will treat carbon as an optimisation variable, comparable in discipline to cost and schedule. Those that do not will continue to treat it as a reporting burden, and they will face progressively harder tradeoffs as regulatory limits tighten and capital markets sharpen their pricing of carbon transparency.

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What This Means For Decision-Makers



LEED v5 is not an incremental update. It is a redefinition of what building performance means and where the responsibility for it sits in the project lifecycle. The centre of gravity has moved upstream: from operations to design, from procurement teams to capital allocators, and from sustainability reports into project briefs.

Three questions are becoming standard at investment committee and project initiation stages:

What is the embodied carbon budget for this asset, and how does it compare to jurisdictional limits and portfolio-level commitments?

Which material and structural decisions deliver the highest carbon reduction per unit of cost, and have they been evaluated at concept stage rather than after procurement?

What data infrastructure exists to track these decisions continuously from design through procurement, construction, and ongoing operation?

The answers will increasingly determine which projects get built, how they are financed, and what they are worth at exit. The frameworks have moved. The capital is moving. The remaining question is how quickly project teams build the data capability to keep pace.

08

How KarbunWise Delivers This Capability

KarbunWise is built around a purpose-specific Building LCA module that gives project teams the data precision, modelling depth, and certification-ready outputs that whole-life carbon management requires. Grounded in over 200,000 verified emission factors drawn from globally recognised databases including Ecoinvent, UL Solutions, The International EPD System, Tata Steel Limited and many more - the platform is designed for the construction context, not adapted from it.



Complete lifecycle coverage, pre-mapped and ready to model

The Building LCA module starts with every EN-defined lifecycle stage - from raw material extraction and manufacturing (A1–A3) through construction activity (A4–A5), use-phase maintenance and operational energy (B1–B7), end-of-life demolition and disposal (C1–C4), and beyond the system boundary credits for reuse and recovery (Module D). These stages come pre-structured within the platform, removing the setup burden that delays most LCA work and ensuring the scope of every assessment is complete from the outset. A full assessment that would previously take months can be completed in days.

Construction-grade emissions database and intelligent data selection

Every emission factor in the platform is continuously updated and sourced from regulator-approved datasets relevant to real-world materials, systems, and construction processes. An Intelligent Activity Explorer allows project teams to search, compare, and validate the right datasets with full transparency on source boundaries, units, and process metadata - eliminating the guesswork and manual verification that make spreadsheet-based LCA so time-intensive. This level of data traceability is what makes KarbunWise assessments suitable for regulatory filings, and green building certification across LEED, BREEAM, and IGBC simultaneously.

Scenario and variant simulation

One of the most consequential capabilities KarbunWise offers is the ability to test design, material, and logistics options against each other in real time. Comparing a steel frame against mass timber, evaluating a lower-carbon concrete mix, or modelling a different supply chain route each produces an immediate carbon impact view of 25+ impact categories across CO_2e, energy, water, and land-use metrics. This is the functionality that allows carbon to operate as a genuine design variable rather than a post-procurement calculation, shifting the assessment from a compliance output into an optimisation tool used at the moments when design decisions are still changeable.

KarbunWise pre-configured templates

Project teams can accelerate assessments using pre-built templates calibrated for common processes. The templates are designed to capture precise emissions data for different material compositions, helping teams generate more accurate embodied carbon calculations based on actual mix elements rather than generic assumptions. These templates remain fully editable, allowing teams to adapt calculations to different design stages, supplier inputs, and project requirements.

Built-in circularity modelling

KarbunWise calculates Module D credits and upstream impact adjustments for reuse and recycling pathways automatically, embedding circularity into the lifecycle model rather than treating it as a separate exercise. For project teams targeting LEED v5 credits or aligning with whole-life carbon reduction commitments, this means the full carbon benefit of circular material strategies is captured and documented without additional analytical work.

Compliance-ready reporting outputs

Every assessment generates structured Excel and PDF reports designed to support certification reviews, and third-party verification workflows. Outputs include detailed embodied carbon breakdowns by material, lifecycle stage, and building element, along with carbon hotspot analysis to identify the primary emission contributors across the project.

Reports are structured to support submissions for green building and disclosure frameworks including LEED, BREEAM, and IGBC. For organisations managing projects across multiple regions and certification systems, the same centralized data layer can be reused across reporting requirements without rebuilding assessments.



To see how KarbunWise supports LEED v5 readiness and whole-life carbon management across your portfolio, visit karbunwise.com or book a demonstration with the team.

Book a Demo:	Email Us:
www.karbunwise.com/contact-us	team@karbunwise.com

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- SEBI - Business Responsibility and Sustainability Reporting Framework

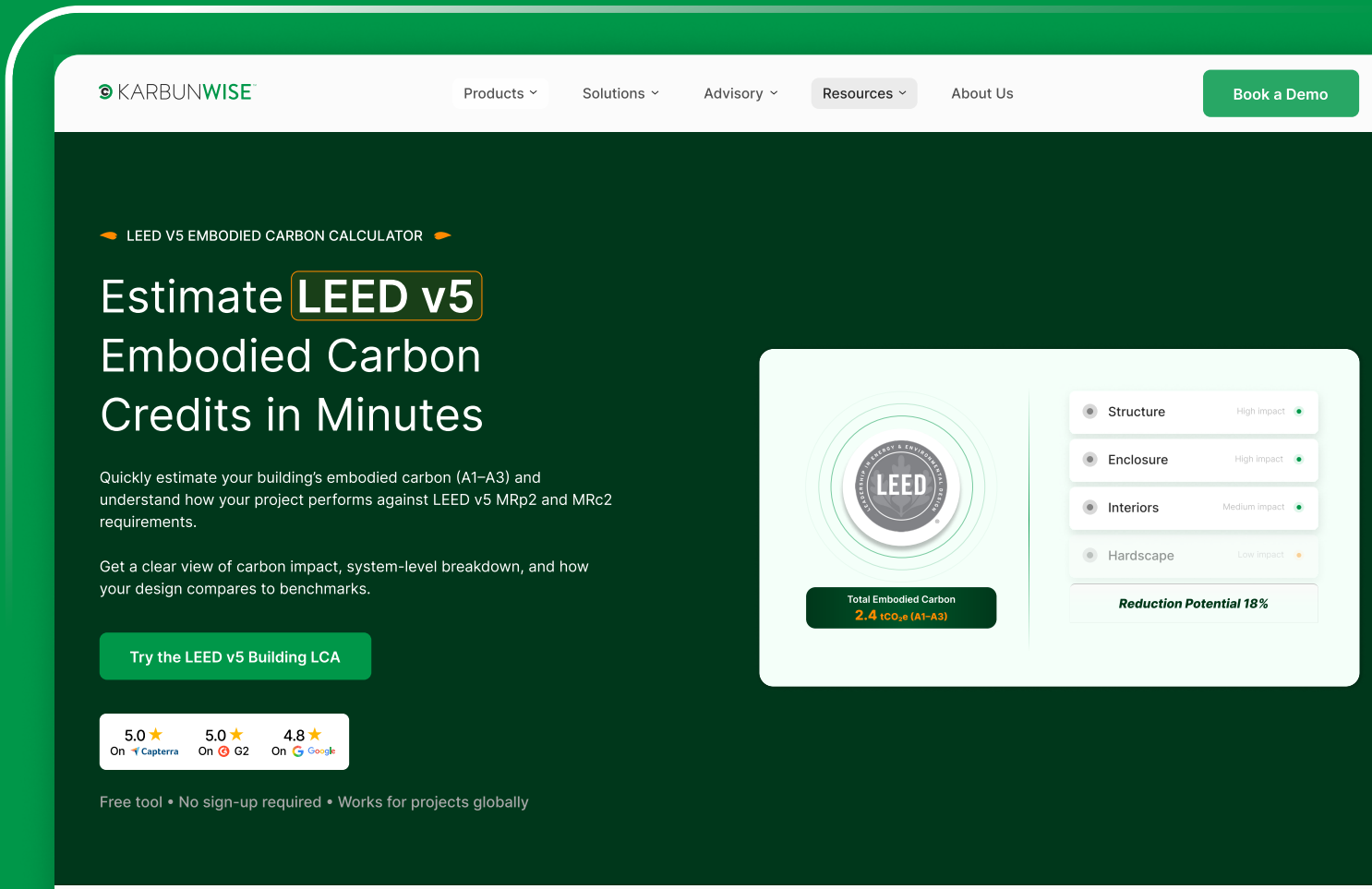
Notes:

This paper is intended for informational purposes. All regulatory requirements should be verified against current jurisdiction-specific guidance. LEED v5 certification criteria are subject to ongoing USGBC revision.

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Take the first step and try our free LEED v5 LCA Calculator

Estimate your LEED v5 points



HOW IT WORKS

Estimate Your Building's Embodied Carbon in Four Steps