



Kappika Futures Report - The Future of Sustainable Construction in the UK (2026–2035)



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1

Strategic Framing

1. Strategic Framing

Strategic framing

Sustainable construction is shifting from a values-led agenda to a competitiveness agenda. The near-term drivers are no longer limited to climate targets: they include construction product safety reform, domestic industrial resilience, and an emerging “data obligation” in the built environment (whole-life carbon, provenance, and performance evidence). The most investable opportunities sit where these pressures intersect: low-carbon material substitution, industrial-scale decarbonisation of heavy materials, and digitally verifiable compliance infrastructures.

Likely central tensions

The UK’s opportunity is real, but it is not “free.” Three tensions define the next decade: (1) speed of housing and infrastructure delivery versus rising safety and environmental demands; (2) domestic manufacturing and secure supply chains versus cost pressure and import exposure; (3) breakthrough materials versus conservative procurement, certification, and insurance norms that penalise novelty until years of evidence accrue.

Core drivers shaping the domain to 2035

- Policy and procurement signal strength: public procurement guidance explicitly encourages whole-life carbon approaches; local planning in the capital already requires whole life-cycle carbon assessments for referable projects, and global bodies are pushing embodied-carbon limits into building codes by 2030.
- Industrial decarbonisation pathways for cement, steel, and heat: UK cement and concrete have already cut emissions materially since 1990; the next tranche depends heavily on CCUS infrastructure and competitive energy pricing.
- Feedstock and circularity constraints: conventional “low-carbon concrete” levers (notably fly ash and slag) face structural supply pressure as coal is phased out and steelmaking changes; this pushes the market toward alternative SCMs, reclaimed stockpiles, and novel binders.
- Verification infrastructure (EPDs, comparability, product safety regime): the UK’s ability to scale sustainable materials depends on trustworthy, comparable product data and a reformed construction product regime after safety failures.
- Capability and labour: skills shortages remain a bottleneck for low-carbon delivery, especially retrofit and new methods of construction; government has already earmarked significant funding to address construction skills.

1. Strategic Framing

Executive framing and key messages

Executive Summary

The built environment is a major emissions and resource system in the UK, with parliamentary analysis repeatedly putting it at around a quarter of national greenhouse-gas emissions. Against this baseline, the “sustainable construction” opportunity to 2035 is best understood as three interconnected markets:

First, **material substitution and circularity at scale**: reducing embodied carbon and waste by changing what gets specified (cementitious binders, bricks, insulation, structural systems) and what gets reused. England alone generated 63.0 million tonnes of non-hazardous construction and demolition waste in 2022, with 59.4 million tonnes recovered, but much of that recovery is still downcycling rather than high-value reuse.

Second, **industrial decarbonisation of foundation materials**: (especially cement and lime): the UK concrete and cement industry reports a 63% emissions reduction between 1990 and 2023, but it also highlights rising imports and the need for CCUS and supportive policy to avoid carbon leakage and deindustrialisation. In parallel, UK policy is hardening against carbon leakage: a UK carbon border adjustment mechanism is legislated to begin in January 2027, with draft secondary legislation under consultation as of February 2026.

Third, **measurement-to-procurement infrastructure**: the market is moving from “carbon intent” to “carbon evidence.” This includes whole-life carbon assessment requirements (already present in London planning), the climb in demand for Environmental Product Declarations (EPDs) and their comparability, and construction product safety reforms.

Globally, the UK is not starting from zero. Internationally, buildings consume about 32% of global energy and contribute about 34% of global CO₂ emissions, while materials such as cement and steel are a major driver of embodied emissions. Several European peers have already moved from voluntary approaches to mandated whole-life or embodied-carbon reporting and limits. Sweden requires climate declarations for new buildings, and Denmark has introduced embodied-carbon limits in building regulations with a tightening trajectory. France's RE2020 is another example of nationally legislated tightening over time.

The UK has strong ingredients (science base, standards development, and industrial clusters), but remains at risk of missing the compounding advantage that comes from clear national embodied-carbon regulation and scaled domestic manufacturing.



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Key Messages for LPs, Founders, Investors

2. Key Messages for LPs, Founders, Investors

For LPs, founders, and co-investors, the UK sustainable construction thesis works only if it is grounded in how construction buys and de-risks change.

- **For LPs:** Returns will concentrate where companies either (a) become default suppliers under tightening product and carbon evidence regimes, or (b) attach to large balance sheets and infrastructure (CCUS, major materials capacity). The risk is that “good tech” dies in the certification valley of death or is commoditised before scale.
- **For founders:** Product performance is necessary, but not sufficient. Winning roadmaps must include test standards, third-party certification, liability allocation, and supply-chain proof. The UK’s construction product regime reform agenda makes compliance and evidence substantially more central than it was pre-2020.
- **For investors:** Look for credible “pull” mechanisms: procurement frameworks that reward whole-life carbon reduction, planning requirements for whole-life carbon, and policy instruments like CBAM that reshape relative costs.

2. Key Messages for LPs, Founders, Investors

Snapshot of opportunity, risk, and UK positioning

Why the opportunity is durable

Globally, building-sector policy is converging on faster rollout of codes, stronger embodied-carbon action, and higher investment in energy efficiency and low-carbon materials. UNEP and GlobalABC explicitly call for embodied-carbon limits in building codes by 2030 for major emitters, and for major increases in investment and retrofit rates. In the UK, public procurement guidance encourages whole-life carbon approaches, and London planning policy requires whole life-cycle carbon assessments for referable developments. Together, this creates a plausible demand environment for companies that can offer: (a) verified, lower-carbon products; (b) comparable data; and (c) predictable performance and compliance at scale.

Where the risk concentrates

The UK's structural risk is that it becomes a "design and consulting leader" but not a "manufacturing and deployment leader." Mineral products data show rising cement import penetration (around a third of domestic sales in 2023), and declining domestic availability of traditional low-carbon cement substitutes (fly ash, slag), increasing reliance on imports and stockpile recovery. At the same time, construction product safety reforms and certification needs increase the time and cost-to-market for novel materials.

Opportunity vs risk matrix (illustrative investment lens, to 2035)

	Lower execution risk	Higher execution risk
Higher commercial upside	Verified low-carbon "drop-in" products (e.g., lower-carbon cement blends within existing spec pathways; recycled aggregates with documented performance)	Step-change industrial and biological materials (e.g., CCUS-enabled cement and lime; novel binders; biomanufactured insulation and panels)
Lower commercial upside	Compliance enablers that become table-stakes (basic carbon reporting tooling without procurement integration)	"Nice-to-have" pilots with weak pathways to certification, insurance acceptance, or cost parity

2. Key Messages for LPs, Founders, Investors

Commentary on UK positioning

The UK is comparatively strong in standards, professional services, and innovation programming. It has a nationally coordinated construction-sector net-zero program (Construction Leadership Council CO2nstructZero) and major public procurement guidance (Cabinet Office Construction Playbook) that explicitly reference whole-life carbon approaches. The UK is also strong in advanced materials R&D infrastructure (UK Research and Innovation programs; Henry Royce Institute), and in translational test capability (BRE Group).

However, relative to European forerunners that have mandated embodied-carbon reporting and limits at national level, the UK's main weakness is uneven "hard demand" for embodied-carbon reduction outside leading clients and jurisdictions. Denmark and Sweden illustrate a pathway where regulation forces market-wide learning, data infrastructure buildout, and supplier response. The UK has strong voluntary momentum (including the pilot UK Net Zero Carbon Buildings Standard), but voluntary adoption alone rarely shifts commodity supply chains at scale without procurement mandates or carbon pricing pressure.

3

Introduction and Market Landscape

3. Introduction and Market Landscape

Introduction (why this matters now, methodology, scope)

Why this matters now: The UK is entering a decade where three forces are intensifying at once: (1) pressure to deliver housing and infrastructure; (2) tightening expectations on product safety and liability; and (3) a global shift toward embodied-carbon action and carbon-leakage instruments. This combination disproportionately reshapes materials markets because materials sit at the junction of industrial emissions, construction risk, and procurement evidence.

Methodology: This report triangulates primary and near-primary sources (UK government consultations and guidance, parliamentary committee publications, industry roadmaps and datasets, UKRI program information, and international policy benchmarks), complemented by company disclosures for specific UK firms and academic literature for materials constraints. The assessment horizon is to 2035, with scenario ranges designed to be decision-supportive rather than predictive.

Scope: UK-centric, globally benchmarked, with emphasis on materials and practices (cement and concrete, masonry, timber and bio-based materials, insulation, circularity and reuse, industrial decarbonisation infrastructure, and the data and certification systems that determine adoption). Operational energy policy is referenced only where it changes material choices (for example, retrofit volumes that increase insulation demand).

Market Landscape and Global Context

At the global level, buildings and construction are still a central climate and resource system: the sector consumes about 32% of global energy and contributes about 34% of global CO₂ emissions according to UNEP and GlobalABC, while materials such as cement and steel are major embodied-carbon drivers. Despite progress, the same global sources argue current trajectories are insufficient for Paris-aligned targets and explicitly call for embodied-carbon limits in building codes by 2030 for major emitters.

Europe provides relevant benchmarks for the UK because it combines high regulatory capacity with mature construction markets. Sweden's climate declaration requirement for new buildings (in force from January 2022) shows how mandated reporting can create a baseline "evidence workflow" across the industry. Denmark has moved further by embedding whole-life or embodied-carbon limits into building regulations and setting out tightening trajectories. France's RE2020 demonstrates staged tightening of both operational and embodied carbon requirements over time.

The UK sits in a hybrid position. It has sophisticated standards, strong design capabilities, and an active voluntary ecosystem, but less consistent national compulsion on embodied carbon compared to the most advanced European regimes. London's planning framework already requires whole life-cycle carbon assessments for referable developments, which effectively makes whole-life carbon a "soft regulation" for a significant share of high-value projects. The UK also has strong public procurement guidance encouraging whole-life carbon approaches.

3. Introduction and Market Landscape

One practical implication is that the UK market is likely to bifurcate through 2030: leading clients and jurisdictions will move to procurement-on-evidence, while the long tail remains cost-driven and standards-constrained. That bifurcation matters for startups, because it changes whether “first customers” can support the costs of certification, EPD production, and early manufacturing scale-up.

3. Introduction and Market Landscape

Why the UK can win (capability stack)

The UK's "innovation stack" for sustainable construction is stronger than it often appears because it combines (a) advanced materials R&D infrastructure, (b) test and certification capability, and (c) industry-wide programs aimed at modernising construction and decarbonising supply chains.

On research and translation, the UK has national advanced materials infrastructure (notably the Henry Royce Institute, funded via EPSRC/UKRI) and a construction-modernisation program track record through the Industrial Strategy Challenge Fund's "Transforming Construction" challenge (2018-2023) led by Innovate UK and partners. Complementing this is the High Value Manufacturing Catapult network, which is explicitly oriented toward scaling and proving manufacturing processes.

For infrastructure-grade testing and validation, UKCRIC provides distributed laboratories and observatories across UK universities, including large-structure and materials testing capabilities. For product-level testing, inspection, and certification, BRE Group and the British Board of Agrément provide routes to independent assessment and certification, which are decisive gating factors for adoption in conservative specifications.

Where clusters are forming (materials and practices emphasis)

A practical "opportunity map" is best built around where manufacturing, feedstocks, and market pull coincide:

- **Low-carbon cement and binders:** Strong industrial presence and active transition roadmaps from trade bodies suggest sustained effort. Example commercial activity includes production in Wrexham for ultra-low carbon cement approaches (see company spotlight later).
- **Circular masonry and waste-derived products:** Scotland has visible commercialisation of low-carbon bricks (East Lothian), enabled by public support bodies and certification milestones.
- **Bio-based insulation and biotech-convergent materials:** London and wider UK innovation networks host companies using biology and residues to produce insulation and panels, but manufacturing footprints may sit outside the UK depending on cost and permitting.
- **Timber and engineered wood:** Government has explicitly renewed a timber-in-construction roadmap, linking housing delivery to increased use of sustainable timber and domestic supply chain development.

3. Introduction and Market Landscape

Where the UK is strong, weak, or at risk

Strong: Research infrastructure, test and certification institutions, and early-stage innovation support (UKRI programs).

Weak: Consistent national “demand compulsion” for embodied-carbon reduction outside leading clients and London; and scale manufacturing economics under high industrial energy prices (flagged as a competitiveness issue by material-sector roadmaps).

At risk: Feedstock constraints (declining slag and fly ash availability) could force import reliance unless alternative SCMs and reclaimed stockpiles scale; this can erode both carbon advantage and industrial resilience.



4

Startups, Scaleups and Commercial Activity

4. Startups, Scaleups and Commercial Activity

What is changing in the startup mix

The UK's sustainable construction startup landscape is increasingly "materials plus": not only new materials, but also new manufacturing processes, provenance data, certification pathways, and integration into procurement workflows. This is a response to how the sector actually adopts innovation: construction does not buy "novelty," it buys "risk reduction." The construction-product regime reform agenda reinforces this by raising expectations around accountability and compliance evidence.

Below are five UK companies that illustrate the commercial frontier, without assuming they represent the entire opportunity set.

Mykor Ltd (mycelium and residues-based insulation)

Founded in 2021, Mykor is building a new model for construction, enabling the production of building systems that are grown rather than extracted, supporting both human and planetary health. By combining biofabrication with industrial processes, the company creates high-performance, low-carbon materials addressing a critical challenge in construction, where incumbent materials carry high embodied carbon and are increasingly misaligned with tightening regulatory and performance standards.

Its flagship product, MykoSIP, is a mycelium-based prefabricated internal wall system designed as a drop-in replacement for conventional assemblies, with a clear pathway to cost parity. Currently at TRL8, MykoSIP has undergone commercial testing, achieving

Euroclass B fire resistance, 45 dB acoustic performance, strong thermal conductivity, and a negative life cycle assessment (LCA), positioning it as a scalable, low-carbon alternative to traditional materials.



Material Evolution (ultra-low carbon cement and binder technology)

Material Evolution has been profiled by Innovate UK channels as translating collaborative R&D into an industrial-scale production facility in the UK, which matters because binders are both emissions-intensive and high-volume. The company describes an ultra-low carbon cement product and a production facility in Wrexham, and it has also reported non-dilutive and debt-style financing (including venture debt) to support scaling, illustrating the capital intensity of materials deployment.

Investment relevance: cement is a commodity market, so durable advantage depends on integrated manufacturing economics (energy, feedstock access), compliance with standards, and procurement pull. A key structural headwind is that conventional supplementary cementitious material supply is tightening across Europe, which may shift the cost curve for low-carbon cement pathways.

4. Startups, Scaleups and Commercial Activity

Kenoteq (waste-derived low-carbon bricks)

Kenoteq is a clean-tech spin-out from Heriot-Watt University focused on low-carbon bricks made largely from recycled construction waste; third-party and institutional sources describe commercial ramp-up in East Lothian with capacity targets in the millions of bricks annually. A key commercial milestone is independent certification: the British Board of Agrément has publicly reported certifying the product, supporting broader specification uptake.

Investment relevance: the UK imports a large number of bricks, and certification plus automation could create a credible “re-shoring plus carbon” proposition. The main question is whether unit economics and throughput can compete with incumbent supply at scale while maintaining consistent material properties from heterogeneous waste feedstocks.

Bio-based and biotech materials (Biohm as an illustrative UK player) Biohm positions itself as an R&D-led company developing regenerative materials for the built environment, including mycelium-based approaches.

Investment relevance: the category is strategic because it converges biotech and construction, potentially creating differentiated IP and new supply chains. But it also inherits biotech-like risks (process control, contamination, scale-up yield) and construction-like risks (certification and liability). This combination pushes financing needs toward patient capital and requires a clear TRL-to-market pathway.

Circular aggregates and carbon mineralisation (Carbon8 Systems as a cautionary signal)

Circular construction is investable, but it is not automatically investable. Carbon8 Systems, a UK CCUS and green-aggregates firm, entered administration in November 2025, according to administrators and sector reporting.

Investment relevance: this is a reminder that “carbon-negative aggregates” can be caught between capital intensity, long sales cycles, and the need for stable offtake. The lesson is not that the category is invalid, but that capital structure, customer concentration, and time-to-certification can kill otherwise strong technology narratives.

5

Strategic Investors and Capital Landscape

5. Strategic Investors and Capital Landscape

Why capital allocation is changing

Two forces are reshaping capital stacks for sustainable construction: (1) industrial decarbonisation is becoming infrastructure-like (especially CCUS), requiring blended finance; and (2) materials and construction-tech ventures face longer commercialisation cycles than many software-first climate categories because compliance, testing, and procurement evidence are unavoidable.

Public and quasi-public capital

The UK has moved toward more explicit state-backed catalytic capital for industrial decarbonisation. The National Wealth Fund was reported as launched to accelerate decarbonisation in heavy industry and unlock additional private capital. In cement and lime specifically, Reuters reports contracts signed for carbon capture projects including a cement plant in north Wales, part of a wider UK funding commitment for CCUS.

For earlier-stage innovation, UKRI program history matters: the “Transforming Construction” challenge delivered a sizable budget with industry match, oriented toward manufacturing and digital processes in construction. This type of program is a demand-side signal: government is willing to fund shifts in the production model, not only incremental efficiency.

Private capital and strategic corporate investors

In the near term, corporations in cement, aggregates, and building products are the most plausible acquirers and strategic partners for materials startups. The pathway is visible in CCUS cluster development, where cement and lime plants align with shared CO₂ transport and storage infrastructure, and in circular construction where major building-material firms acquire recycling capacity.

One UK-relevant strategic dynamic is carbon leakage and trade exposure. With UK CBAM planned from January 2027, and cement in scope, imported material costs and reporting burdens should change, potentially rewarding domestic low-carbon production if implemented cleanly. This is not guaranteed: policy design details determine whether CBAM creates real market pull or just administrative friction.

Funding gaps across TRLs (materials and construction reality)

Technology readiness levels are explicitly used in UK funding contexts (UKRI documents describe nine TRLs, from basic principles to proven systems). The crucial investment insight is that “TRL maturity” and “construction adoption readiness” diverge: a material can be scientifically mature but commercially blocked by certification and insurance.

5. Strategic Investors and Capital Landscape

A practical gap map for sustainable construction materials:

- **TRL 1-3 (lab proof, early validation):** comparatively well served by academic and grant funding in the UK system.
- **TRL 4-6 (pilot, relevant-environment demonstration):** often the hardest phase for materials, because it requires pilot manufacturing, stability data, and early certification engagement. This is where non-dilutive innovation programs help, but timelines can still be misaligned with venture expectations.
- **TRL 7-8 (first-of-a-kind plant, qualification):** the “capital cliff.” Industrial facilities and CCUS infrastructure need blended finance and long-duration risk tolerance; the state is now acting here, but coverage is partial.
- **TRL 9 (scaled deployment):** requires either commodity-cost competitiveness or regulatory procurement mandates plus credible offtake contracts. UK import exposure in cement illustrates why competitiveness matters.

5. Strategic Investors and Capital Landscape

Incumbents and Value Chain Leaders

Why incumbents matter more than usual in construction

In sustainable construction, incumbents are not only competitors; they are the “system operators” of standards, capacity, logistics, and liability. Many innovations will scale only if incumbents adopt, license, distribute, or acquire them, especially in commodity materials and regulated product categories. This is structurally reinforced by procurement guidance favouring whole-life outcomes, and by safety-driven reform of the construction products regime.

Heavy materials: cement, lime, and CCUS as a shared infrastructure play

The UK concrete and cement sector frames CCUS as critical for deep decarbonisation and highlights policy needs to maintain domestic supply and avoid offshoring emissions. Two visible pathways are emerging:

- Holcim UK is publicly associated with “Peak Cluster” development, describing carbon capture across multiple cement and lime sites and transport to offshore storage (Morecambe Net Zero) operated by Spirit Energy.
- Reuters reports decarbonisation contracts including a cement plant operated by Heidelberg Materials UK, with captured CO₂ transported and stored via the Liverpool Bay project, and first net-zero cement expected later in the decade.

The investable insight is that CCUS creates platform effects: once a CO₂ network exists, adjacent industrial sites can plug in. But the inverse is also true: without shared CO₂ transport and storage, plant-level projects remain stranded.

Mineral products and circular aggregates

The Mineral Products Association dataset highlights three adoption constraints that create investable niches: (1) a lack of consistent national data on recycled aggregates usage (making policy and procurement harder), (2) declining domestic slag production and fly ash generation, and (3) rising cement imports.

This creates a practical opportunity thesis: technologies that unlock reclaimed stockpiles, enhance secondary material quality, and provide credible EPD-backed evidence can become increasingly valuable as conventional substitutes tighten.

Specification, certification, and assurance institutions

Third-party verification is a competitive moat in construction because it compresses sales cycles and reduces buyer perceived risk. The British Board of Agrément positions its Agrément Certificates as validation against relevant standards, and BRE Group provides independent testing and certification for products and whole buildings.

Investment relevance: companies that build certification strategy into product design and manufacturing choices can become “specifiable” earlier, which often matters more than incremental performance gains.



6

Risks, Barriers and Systemic Challenges

6. Risks, Barriers and Systemic Challenges

Regulatory uncertainty and uneven demand compulsion

UK momentum is real but uneven. Where planning and procurement require whole-life carbon assessment, markets move. Where it remains voluntary, adoption can stall. London's whole life-cycle carbon policy is a clear example of a localised compulsion mechanism. At the national level, the UK is contemplating multiple reforms (construction product regime reform; CBAM implementation), but each introduces uncertainty and administrative load for suppliers.

Certification, liability, and insurance friction for novel materials

Construction product adoption is slowed by the need for independent evidence and by risk transfer norms. Certification bodies emphasise rigorous testing; for innovators this is an unavoidable cost and timeline driver.

Mass timber illustrates the dynamic: even when structural performance is strong, perceived fire and moisture risk can trigger insurance challenges, increasing friction for adoption. This matters for sustainable construction because many low-carbon materials are novel or unfamiliar to underwriters.

Feedstock bottlenecks and unintended consequences of decarbonisation

The UK is materially exposed to shortages in key low-carbon cement substitutes because coal phase-out reduces new fly ash production, and steel sector transitions reduce slag supply. The mineral products profile documents the decline in UK slag production and highlights that domestic fly ash production has fallen substantially due to coal phase-out, though stockpiles remain. Academic scenario work (EU-wide and UK-specific) reinforces the direction of travel: conventional SCM supply is projected to tighten substantially, creating structural scarcity.

This can create a paradox: decarbonising steel can unintentionally raise the cost of “green” concrete if slag becomes scarce. That is a non-obvious systems risk and a key reason to back alternative SCMs and reclaimed stockpile processing.

Data quality, EPD comparability, and the “measurement tax”

EPDs are increasingly central to material choice, but comparability and uncertainty issues are non-trivial. The Construction Products Association publishes detailed guidance on EPD comparability and uncertainty, implying that naive “EPD shopping” can mislead if underlying rules differ. RICS also emphasises the role and barriers around EPD adoption (skills, technology, data).

Investment relevance: There is a platform opportunity in trustworthy, automated, audit-ready product carbon data infrastructure, but it must integrate with procurement and assurance to avoid becoming commoditised software.

6. Risks, Barriers and Systemic Challenges

Infrastructure bottlenecks

Several bottlenecks are recurring and investment-relevant to 2035:

- **CCUS transport and storage networks:** plant-level CCUS plans depend on shared pipeline and storage buildout; Peak Cluster is explicitly framed around this infrastructure coupling.
- **Industrial energy pricing and competitiveness:** the cement and concrete roadmap flags high industrial electricity prices and uneven carbon costs as competitiveness headwinds, with rising imports cited as a risk.
- **Testing and certification capacity:** growing numbers of novel products increase demand for testing and certification throughput.
- **Skilled labour:** construction skills shortages remain a bottleneck, with government responding through major training commitments and sector roadmaps.



Signals, Scenarios and Strategic Outlook (3 plausible scenarios)

7. Signals, Scenarios and Strategic Outlook (3 plausible scenarios)

Signals to track from 2026 onward

The most decision-relevant signals are those that convert intent into enforceable demand:

- **Carbon leakage and trade measures:** Draft legislation for UK CBAM, intended to start January 1, 2027, is under consultation (closing March 24, 2026). Cement is explicitly within the policy scope in government response documentation.
- **Acceleration of embodied-carbon code pathways:** Global bodies explicitly calling for embodied-carbon limits in building codes by 2030 increases the probability that UK policy converges with European peers over time.
- **Industrial decarbonisation contractual reality:** Announced CCUS contracts and cluster developments move the topic from aspiration to delivery risk, with visible timelines into the late 2020s.
- **Timber adoption as a policy-backed pathway:** the UK's updated timber roadmap explicitly ties housing delivery to increased timber use and domestic supply chain expansion, suggesting sustained policy attention despite safety constraints.
- **Construction product regime reform:** the 2025 green paper indicates continuing change in product accountability expectations, likely increasing the premium on credible evidence and trusted certification.

Scenarios to 2035 (quantified or directional)

These scenarios are structured to support strategy. They are not forecasts; they are plausible pathways defined by policy strength, infrastructure delivery, and supply-chain constraints.

Scenario A: Regulated embodied carbon and domestic scaling

Logic: UK aligns more closely with leading European approaches by moving from voluntary assessment to widespread mandated embodied-carbon reporting and progressively tighter limits in key building types. This is consistent with global calls for embodied-carbon limits by 2030 and with UK-local precedents (London WLCA requirements).

Directional outcomes by 2035

- Whole-life carbon assessment becomes “default process” across major public and large private projects (directional: majority adoption), and EPD coverage expands rapidly due to procurement pull.
- Novel binders and alternative SCM pathways scale as conventional SCM scarcity tightens; reclaimed fly ash stockpiles become an increasingly strategic secondary resource.
- Industrial decarbonisation moves from pilots to multiple operational CCUS-linked cement and lime plants, leveraging shared CO₂ networks; this follows announced CCUS project timelines moving toward net-zero cement production in the late 2020s.

7. Signals, Scenarios and Strategic Outlook (3 plausible scenarios)

Scenario B: Patchwork compliance and import-led decarbonisation

Logic: The UK continues with localised compulsion (London and leading clients) but does not create strong national embodied-carbon mandates. Demand for low-carbon materials grows, but domestic manufacturing struggles with energy costs and carbon-cost asymmetries, so imports rise. This aligns with industry warnings about import share and competitiveness.

Directional outcomes by 2035

- Cement and product imports remain elevated or rise (directional), with carbon cost and paperwork increasing due to CBAM-style requirements but without commensurate domestic capacity buildout.
- The UK becomes a leader in measurement services and standards, but captures less manufacturing value, limiting jobs and export leverage.

Scenario C: Supply-chain shock forces material-system redesign

Logic: Conventional SCM scarcity bites faster, while industrial decarbonisation in steel and coal phase-out removes key by-products, forcing redesign of cementitious systems and accelerating alternatives. Peer-reviewed scenario analysis indicates steep declines in fly ash and slag supply across Europe, and UK-specific literature points to disruption of cement-steel symbiosis.

Quantified anchor points (from literature and UK datasets)

- UK slag production fell from ~5 million tonnes in 2008 to ~1.4 million tonnes in 2023, indicating domestic supply contraction already underway; fly ash stockpiles are estimated up to ~100 million tonnes, but recovery and qualification become critical.
- EU-wide scenario modelling projects fly ash supply falling sharply by 2035 and slag supply similarly tightening (directional: large reduction), implying structurally higher prices and import dependence unless alternatives mature.

Directional outcomes by 2035

- Procurement shifts toward (a) material efficiency and structural optimisation (“build less”), (b) reclaimed materials with verified performance, and (c) alternative binders and bio-based systems where code and insurance allow.
- A subset of circularity businesses becomes strategically valuable because they offer the “new feedstocks” the sector needs, but failures remain likely where capex and offtake are mismatched (as illustrated by Carbon8’s administration).

8

**Implications for LPs, Founders and Policymakers
(tiered recommendations by actor)**

8. Implications for LPs, Founders and Policymakers (tiered recommendations by actor)

For LPs (portfolio construction and underwriting)

Reasoning: Materials and construction are regulation- and liability-shaped markets. That means power laws will be less about user growth and more about “spec inclusion,” certification, and procurement lock-in.

Recommendations:

- Focus on managers and strategies that can underwrite **longer time-to-scale** (often 7-12 years for materials to reach meaningful penetration) and structure capital to survive certification valleys.
- Back exposure to **infrastructure-adjacent decarbonisation** (for example CCUS-linked industrial projects) via blended or project finance where state catalytic capital is active.
- Treat “data infrastructure” as a durable theme only when it is procurement-embedded and audit-ready (EPD comparability and uncertainty constraints mean robust systems will be valued).

For founders (go-to-market and de-risking strategy)

Reasoning: Construction adoption is gated by certification, demonstration in relevant environments, and risk transfer. Technology alone will not cross these gates.

Recommendations:

- Design product roadmaps around **evidence milestones**: third-party testing, certification plan, EPD strategy, and insurer engagement early.
- Plan supply chains defensively against **SCM scarcity** and price volatility by securing alternative feedstocks and qualification pathways.
- Treat public procurement and planning “compulsion zones” as beachheads: London WLCA requirements and public whole-life carbon guidance can generate early demand if aligned with buyer workflows.

For co-investors and strategic corporates (partnership and acquisition signals)

Reasoning: Incumbent-led scaling is often the fastest path in commodities and regulated products, but incumbents will only move when evidence and economics are credible.

Recommendations:

- Create structured pilots with **pre-agreed scale triggers** (for example: certification achieved, cost curve reached, EPD comparability validated) rather than open-ended trials.
- Use CBAM and carbon-leakage policy as a strategic lens: domestic low-carbon production becomes more attractive if carbon costs and reporting on imports rise from 2027.

8. Implications for LPs, Founders and Policymakers (tiered recommendations by actor)

For policymakers (unlocking adoption rather than only funding innovation)

Reasoning: The market failure is less “lack of ideas” and more “lack of scalable adoption pathways,” especially given certification, data, and supply-chain constraints.

Recommendations:

- Move toward **consistent national embodied-carbon requirements** (at minimum mandatory reporting for major projects) to reduce market fragmentation and build learning effects, consistent with global guidance.
- Invest in **enabling infrastructure:** CCUS networks, testing and certification capacity, and national-quality datasets for recycled materials use (which current UK datasets flag as incomplete).
- Address **industrial competitiveness** (energy pricing and carbon cost asymmetries) to prevent import-led decarbonisation that exports jobs and emissions accountability.
- Fund workforce scale-up in the retrofit and low-carbon construction supply chain, aligning with existing sector skills roadmaps and recent public commitments.

9

Appendices (Glossary, References, Methodology)

9. Appendices (Glossary, References, Methodology)

Glossary of Terms

Bio-Based Materials

Construction materials derived from renewable biological sources such as plants, fungi, or agricultural residues.

Carbon Border Adjustment Mechanism (CBAM)

A policy that places a carbon cost on imported goods equivalent to domestic carbon pricing to prevent emissions-intensive production shifting overseas.

Carbon Capture, Utilisation and Storage (CCUS)

Technologies that capture carbon dioxide emissions from industrial processes and either store them underground or use them in other products.

Certification

Independent confirmation that a construction product meets required safety and performance standards.

Circular Construction

An approach to building that prioritises reuse, recycling, and material recovery to minimise waste and reduce demand for new raw materials.

Clinker

The main ingredient in traditional cement, produced by heating limestone in kilns. Clinker production is responsible for the majority of cement's carbon emissions.

Construction and Demolition Waste (C&D Waste)

Waste generated during the construction, renovation, or demolition of buildings and infrastructure.

Embodied Carbon

Greenhouse gas emissions associated with extracting raw materials, manufacturing building products, transporting them to site, constructing the building, and eventual demolition or disposal.

Environmental Product Declaration (EPD)

A third-party verified document that reports the environmental impacts of a product using standardised life-cycle assessment methods.

Fly Ash

A fine powder produced as a by-product of coal combustion, historically used in concrete to reduce cement content and emissions. Supply is declining as coal power is phased out.

9. Appendices (Glossary, References, Methodology)

Industrial Decarbonisation

The process of reducing greenhouse gas emissions from heavy industries such as cement, steel, and chemicals through new technologies and energy systems.

Life-Cycle Assessment (LCA)

A method used to measure environmental impacts such as emissions, energy use, and resource consumption across the entire life of a product.

Operational Carbon

Emissions generated from the energy used to run a building over its lifetime, including heating, cooling, and electricity use.

Recycled Aggregates

Crushed materials recovered from construction or demolition waste that can be reused in new construction.

Specification

Technical requirements written into building designs that determine which materials and products can be used.

Supplementary Cementitious Materials (SCMs)

Materials used to replace part of the clinker in cement to reduce carbon emissions, commonly including fly ash and ground granulated blast furnace slag.

Technology Readiness Level (TRL)

A scale used to assess the maturity of a technology, ranging from early laboratory research (TRL 1) to full commercial deployment (TRL 9).

Whole Life-Cycle Carbon Assessment (WLCA)

A method for calculating the total carbon emissions of a building across its entire life cycle, including construction, use, maintenance, and end-of-life stages.

9. Appendices (Glossary, References, Methodology)

References (selected, high-load-bearing sources)

- UNEP and GlobalABC, Global Status Report for Buildings and Construction 2024-2025: key messages and global metrics.
- UK Parliament Environmental Audit Committee: built environment emissions framing and policy gaps.
- Cabinet Office: Construction Playbook and whole-life carbon emphasis in public procurement.
- Mineral Products Association: UK concrete and cement decarbonisation roadmap progress and mineral products profile (imports, slag and fly ash constraints).
- Defra: UK statistics on construction and demolition waste generation and recovery.
- Greater London Authority: Whole Life-Cycle Carbon Assessments guidance and policy requirement.
- UK CBAM: draft regulations consultation and policy response establishing 2027 start.
- Construction Products reform consultation (2025): direction of travel in product accountability and regime reform.

9. Appendices (Glossary, References, Methodology)

Methodology (summary)

The report uses a systems lens across (1) materials supply chains, (2) adoption and assurance mechanisms (planning, procurement, certification), and (3) industrial decarbonisation infrastructure. Evidence is drawn primarily from official UK sources, parliamentary publications, established industry bodies, and UN/academic benchmarks; company-specific points are sourced from public disclosures and third-party reporting. Scenario analysis is constructed from evidenced drivers (policy, infrastructure, feedstock constraints), with quantified anchors taken from cited datasets and literature, and ranges expressed directionally where precise UK forecasts are not available or not robust.

Concise summary

Sustainable construction in the UK to 2035 is a materials-and-evidence transformation: the biggest value pools sit in low-carbon material substitution, industrial decarbonisation of cement and related sectors, and the verification infrastructure (EPDs, certification, procurement integration) that determines what scales. The UK is strong in R&D, standards, and early demand signals (public procurement and London planning), but is vulnerable on domestic manufacturing scale, feedstock scarcity (slag and fly ash), and adoption friction (certification, insurance, skills). The most resilient strategies back technologies with credible certification pathways, defensible supply chains, and alignment to emerging policy instruments like CBAM and embodied-carbon limits.

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