

Optimising Sustainable Procurement in UAE - Sustainable Concrete Case Study

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Why is it important?

Concrete is the most widely used construction material in the UAE (Martini et al., 2023). However, it is also a major source of embodied carbon due to greenhouse gas emissions resulting from material extraction, production, and construction processes. While current UAE green building regulations such as Estidama and Al Sa'fat strongly emphasize operational carbon (e.g., energy efficiency), embodied carbon remains largely unregulated and often treated as optional. This is a critical oversight, as embodied carbon can account for up to 50% of a building's total lifetime emissions (Lützkendorf and Balouktsi, 2022). In light of the UAE's commitment to Net Zero by 2050, addressing embodied carbon, especially in high-impact materials like concrete, is essential. Without targeted regulation and procurement reform, emissions embedded in infrastructure risk undermining national climate goals.

What is green concrete?

To address these concerns, several sustainable alternatives to traditional concrete are being explored. Green concrete using Ground Granulated Blast Furnace Slag (GGBS), which replaces 30–80% of cement, is gaining popularity in the UAE for its lower embodied carbon and high durability (Green Cement, 2025; Higgins et al., 2020). It also has potential to be slightly less expensive than traditional Portland cement due to the recycled nature of its materials (Seymour, 2007). Other innovative green concrete alternatives include Ashcrete, made from fly ash, lime, and water (93% recycled material) and Hempcrete, a bio-composite known for its carbon sequestration and insulation properties. However, all of these alternatives face barriers such as limited availability, regulatory gaps, or unsuitability for structural applications.

Policy examples from other countries

California's Buy Clean Act (2017) requires state agencies to purchase construction materials like concrete that meet pre-determined limits for embodied carbon. Compliance with the limits are proved via Environmental Product Declarations (EPDs) that report on a material's environmental impact across its lifecycle. Although some UAE-based concrete manufacturers have developed EPDs for their products like Emirates Beton ReadyMix and Golden Readymix LLC, such action is not mandatory in the UAE.

Zurich's Sustainable Procurement Policy (2008) mandates the use of recycled concrete aggregates and low-CO₂ cement in all publicly owned buildings. Since 2005, at least 25% recycled aggregates are required in concrete for public buildings, increasing to up to 50% in many projects. These procurement rules have effectively created a strong local market for recycled concrete, with 90% of concrete used in public buildings now containing up to 50% recycled aggregates, and similar practices spreading into the private sector.

So, how could greener concrete be promoted in the UAE via embodied carbon limits and mandatory EPDs?

UAE implementability

Success stories from other countries reveal several key factors that drive effective adoption of sustainable concrete:

1. Gradual implementation of regulations to allow industry adaptation,
2. Standardized Environmental Product Declaration (EPD) requirements, and
3. Strong public-private partnerships to ensure both technical and economic viability.

For the UAE, mandating EPDs for concrete in government-funded projects would necessitate establishing a UAE-specific EPD system, supported by a central database and accredited verification bodies. Collaborating with industry stakeholders to develop this EPD system is essential to ensure practicability and fair outcomes.

Reference List

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