

# **Whitepaper 8**

**Life Cycle Environmental Impact of SIPs: Lowering Carbon in Construction**

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## **Executive Summary**

The building industry is under increasing pressure to reduce its carbon footprint and deliver sustainable solutions. Structural Insulated Panels (SIPs) offer a proven path forward, with lower embodied carbon, reduced operational energy demand, and compliance with European sustainability standards. By addressing both embodied energy and operational energy savings, SIPs contribute to achieving climate goals and green building certifications such as BREEAM, LEED, and DGNB.

## **The Challenge: Carbon in Construction**

- Buildings are responsible for ~36% of CO<sub>2</sub> emissions in Europe.
- Regulatory frameworks such as the EU Green Deal and national codes (Dutch Bbl 2024, French RE2020) demand transparent reporting of embodied and operational impacts.
- Developers and investors increasingly require Life Cycle Assessments (LCA) and Environmental Product Declarations (EPD).

## **The Solution: SIPs as a Sustainable System**

SIPs deliver sustainability at multiple levels: - Lower embodied carbon compared to masonry and concrete due to engineered wood products. - Reduced operational energy thanks to continuous insulation and airtightness. - Efficient transport & logistics with flat-pack shipping. - End-of-life recycling and reuse potential, supporting circular construction.

## **Evidence: Research and LCA Results**

- SIP buildings achieve 50–60% lower operational energy compared to traditional builds.
- LCA comparisons show significantly lower embodied carbon than brick/block or concrete.
- SIPs enable easier compliance with BENG (NL), RE2020 (FR), and GEG (DE).

## **Relevant Standards (NEN/EN/ISO)**

- NEN-EN 15804 – Sustainability of construction products (EPD standard)
- NEN-EN ISO 14040/44 – Life Cycle Assessment methodology
- NEN-EN 15978 – Sustainability of buildings (assessment framework)
- NTA 8800 – Energy performance in the Netherlands (replaces NEN 7120)
- NEN-EN ISO 52000 – Energy performance of buildings

## **Conclusion**

SIPs provide measurable benefits in reducing embodied carbon and operational energy use, making them a cornerstone of sustainable construction. With documented compliance to European standards, SIPs offer builders, developers, and investors a pathway to meet environmental targets while saving costs over the lifecycle.

## **Call to Action**

Contact Quacent B.V. at [www.quacent.eu](http://www.quacent.eu) or [info@quacent.eu](mailto:info@quacent.eu) for full LCA/EPD documentation and support in achieving green building certification.