

# Semantic Material Bank: A web-based linked data approach for building decommissioning and material reuse

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## **ABSTRACT**

One of the barriers to circular construction is the lack of availability or visibility of reusable materials and components at the right time and place. Therefore, this paper suggests a digital solution based on identified key stakeholders' information requirements and market motivations. This solution helps close the material loop between the decommissioning phase and the new construction phase through semantic technology-based information exchanges among stakeholders. The proposed ontologies are twofold: 1) a Decommissioning & Reuse Ontology (DOR) that enriches information models with circular and End-of-Life cycle information while 2) the Ontology for Environmental Product Declaration (OEPD) digitalising standardised and comparable sustainable information. Both ontologies are employed in the Semantic Material Bank (SMB) proof-of-concept: a BIM-compliant digital urban mining solution through which defined stakeholders can evaluate the availability and status of reusable and recyclable elements for future construction projects.