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ABSTRACT BOOK

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Association of Collegiate Schools of Architecture
611 Pennsylvania Ave. SE #514
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Digital Technology: Data Perfomance

Friday, March 15, 2024, 11:00am-12:30pm

Carbon Design Bottlenecks: An Empirical Taxonomy Of The Challenges Integrating Carbon Data In The Architecture Practice

Halina Veloso e Zarate, Delft University of Technology (TU Delft)
Manuela Triggianese, Delft University of Technology (TU Delft)
Javier Cuartero, KAAN Architecten
Jantien Stoter, Delft University of Technology (TU Delft)
Renata Gilio, KAAN Architecten

With the growing demand for sustainable accountability, the European Directive 2014/24/EU (EU 2014) pushes architects to deliver Building Information Models (BIM) as a part of procurement processes for public buildings. In the Netherlands, BIM model data is relevant to the building permitting process, which involves an environmental performance calculation (MPG). This assessment takes into consideration the embodied carbon of materials in a building. Although this analysis is performed by a qualified expert in late design phases, architects benefit from integrating carbon data in early design decision-making. Design methods supported by Life Cycle Assessment (LCA) values are needed before involving expert collaborators, and not only when applying for a building permit. The existing carbon assessment tools require detailed data from BIM models, which are often not available at early design phases. Simplified tools have been discussed in theory, and explored in their potential applications, however, there lacks scientific literature discussing the hurdles designers face in their attempt to create such tools in practice, for their internal use throughout early design phases. This paper focuses on the architecture professional practice and design methods supported by digital and computational technologies, regarding embodied carbon data. It investigates the challenges in integrating embodied carbon data in the design workflow, through the development of a digital tool made by designers, for designers. This paper conducts an empirical investigation within a Rotterdam-based architecture office, with a broad portfolio in BIM usage and public building projects, to identify and categorize the factors affecting carbon data integration into the design workflows. It proposes a taxonomy of challenges within the architecture office, to better communicate the designer's needs to the data providers and software developers with architects as a target user. Amongst the bottlenecks encountered are: access to data (data inclusiveness), data literacy and connecting data usage with design decision-making.