TU Delft

Delft University of Technology

Carbon Design Bottlenecks

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

Veloso e Zarate, Halina; Triggianese, Manuela; Cuartero, Javier; Stoter, Jantien; Gilio, Renata

Publication date
2024

Document Version
Final published version

Citation (APA)
Veloso e Zarate, H., Triggianese, M., Cuartero, J., Stoter, J., & Gilio, R. (2024). *Carbon Design Bottlenecks: An Empirical Taxonomy Of The Challenges Integrating Carbon Data In The Architecture Practice*. 66. Abstract from 2024 ACSA 112th Annual Meeting, Vancouver, British Columbia, Canada.

Important note
To cite this publication, please use the final published version (if applicable).
Please check the document version above.

Copyright
Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

Takedown policy
Please contact us and provide details if you believe this document breaches copyrights.
We will remove access to the work immediately and investigate your claim.

This work is downloaded from Delft University of Technology.
For technical reasons the number of authors shown on this cover page is limited to a maximum of 10.

Green Open Access added to TU Delft Institutional Repository

'You share, we take care!' - Taverne project

https://www.openaccess.nl/en/you-share-we-take-care

Otherwise as indicated in the copyright section: the publisher is the copyright holder of this work and the author uses the Dutch legislation to make this work public.

DISRUPTERS ON THE EDGE

ACSA112 ANNUAL MEETING

ABSTRACT BOOK

DISRUPTERS ON THE EDGE
2024 ACSA 112TH ANNUAL MEETING

ABSTRACT BOOK

Steering Committee
Mo Zell, University of Wisconsin, Milwaukee
Germane Barnes, University of Miami
Blair Satterfield, University of British Columbia

Reviews Committee
Mo Zell, University of Wisconsin, Milwaukee
Cathi Ho Schar, University of Hawaii at Manoa
Perry Pei-Ju Yang, Georgia Tech
Kentaro Tsubaki, Tulane University
Suzanne Lettieri, Cornell University
Hans Herrmann, Mississippi State University
Alberto de Salvatierra, University of Calgary
Hala Barakat, University of Idaho

Copyright © 2024 Association of Collegiate Schools of Architecture, Inc., except where otherwise restricted. All rights reserved. No material may be reproduced without permission of the Association of Collegiate Schools of Architecture.

Association of Collegiate Schools of Architecture
611 Pennsylvania Ave. SE #514
Washington, DC 20003
www.acsa-arch.org

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.