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Sheltering 10 billion people in a warming and resource-scarce world: challenges and opportunities

Zhong, X.

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Curriculum Vitae

Xiaoyang Zhong was born in 1992 in Heze, Shandong province, China. After graduating from No.1 High School of Heze Shandong, he studied Engineering Management and obtained his bachelor's degree at Ocean University of China. Xiaoyang continued to study Management Science and Engineering at Chongqing University where he obtained his master's degree in 2018 with a thesis on assessing the water and energy use efficiency of the construction industry in provinces of China. Later that year, Xiaoyang joined the Institute of Environmental Sciences (CML) at Leiden University to work on his PhD research about the environmental challenges of sheltering a growing global population. Before finishing his PhD, Xiaoyang commenced a postdoctoral research position at the same institute, where he joined the Future Availability of Secondary Raw Materials (FutuRaM) project with a focus on scenario analysis of future availability of second raw materials in Europe. Coming April, Xiaoyang will join the Energy, Climate, and Environment (ECE) program of the International Institute for Applied Systems Analysis (IIASA) as a research scholar.

Publication list

Publications related to this thesis

1. **Zhong X**, Deetman S, Tukker A, Behrens P. Increasing material efficiencies of buildings to address the global sand crisis. *Nature Sustainability* 2022: 1-4.
2. **Zhong X.**, Hu M., Deetman S.P., Steubing B.R.P., Lin H., Aguilar Hernandez G.A., Harpprecht C.I., Zhang C., Tukker A. & Behrens P.A. (2021), Global greenhouse gas emissions from residential and commercial building materials and mitigation strategies to 2060, *Nature Communications* 12.
3. **Zhong X.**, Hu M., Deetman S.P., Dias Rodrigues J.F., Lin H., Tukker A. & Behrens P.A. (2021), The evolution and future perspectives of energy intensity in the global building sector 1971–2060, *Journal of Cleaner Production* 305.
4. **Zhong X.**, Fishman T., Behrens P. Embodied emissions from building materials at risk of climate-driven flooding hazards (In preparation for submission to *Nature Climate Change*).

Additional publications

5. Gao J., **Zhong X.**, Cai W., Ren H., Huo T., Wang X. & Mi Z. (2019), Dilution effect of the building area on energy intensity in urban residential buildings, *Nature Communications* 10: 4944.
6. Hong J, **Zhong X**, Guo S, Liu G, Shen GQ, Yu T. Water-energy nexus and its efficiency in China's construction industry: Evidence from province-level data. *Sustainable Cities and Society* 2019, 48: 101557.
7. Zhang C., Hu M., Sprecher B., Yang X., **Zhong X.**, Li C. & Tukker A. (2021), Recycling potential in building energy renovation: a prospective study of the Dutch residential building stock up to 2050, *Journal of Cleaner Production* 301: 126835.
8. Hong Y, Hammad A, **Zhong X**, Wang B, Akbarnezhad A. Comparative modeling approach to capture the differences in BIM adoption decision-making process in Australia and China. *Journal of Construction Engineering and Management* 2020, 146(2): 04019099.
9. Zhang, C., Hu, M., Yang, X., Miranda-Xicotencatl, B., Sprecher, B., Di Maio, F., **Zhong, X.** and Tukker, A., 2020. Upgrading construction and demolition waste management from downcycling to recycling in the Netherlands. *Journal of Cleaner Production*, 266, p.121718.
10. Hong J, Shen GQ, Li CZ, Liu G, Wu Z, **Zhong X**. An integrated framework for embodied energy quantification of buildings in China: A multi-regional perspective. *Resources, Conservation and Recycling* 2018, 138: 183-193.