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# Towards Truly Sustainable Urban Mobility in a Circular Economy: On the Road with IT-Enhanced Bikes Made from 100% Recycled Plastic

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## Towards Truly Sustainable Urban Mobility in a Circular Economy

On the Road with IT-Enhanced Bikes Made from 100% Recycled Plastic

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As sustainability matters, cycling seems a promising option for urban mobility. However, raw materials bought in distant countries, long supply chains, and high material wear challenge today's bikes to be truly sustainable. Hence, although plastic is a much-discussed material with a rather negative connotation, we investigate the potential of '100% plastic' urban bikes and conduct complementary IS research for transforming into a truly sustainable circular economy.

We look at '100% plastic' urban bikes during three phases of the circular economy - pre-use (production), in-use, and post-use (e.g., Konietzko et al. 2020; Zeiss et al. 2021):

- Pre-use (production). Engineering all bike parts from 100% recycled plastic saves resources (producing 1m<sup>3</sup> plastic takes 50% less energy than 1m<sup>3</sup> steel or aluminum (wupperinst.org).
- In-use. Urban '100% plastic' urban bikes meet all performance criteria for urban bikes. They do not rust, are lightweight, and *lubricant-free* – significantly reducing global grease pollution. Containing *smart plastics*, they generate, exchange, and evaluate data, which enable intelligent solutions for condition monitoring, predictive maintenance, and maintenance costs mitigation. They can be accompanied by a *digital bike platform*, which connects companies, users – and eventually bikes – in the industry eco-system, promotes knowledge transfer, and offers online-to-offline (O2O) product and service enhancements.
- Post-use. A chip in every bike frame can serve as an integrated material passport and allows bikes to be bought back for a deposit. Old components serve as raw material for new ones - turning the plastic in the world's landfills into a valuable resource.

Striving towards sustainable urban mobility in a circular economy via '100% plastic' bikes, we follow Zeiss et al. (2021) as we undertake complementing IS research along three trajectories:

- *O2O platform design* aiming at market efficiency and the adoption of '100% plastic' bikes for advancing urban mobility in a circular economy,
- *Open data and data governance issues* in the context of balancing privacy concerns with intelligent mobility solutions, and the
- *Socio-technical discourse* on the interaction of social, economic, and technical factors.

Along those lines, at ICIS, we would like to discuss expectable societal impacts and further interdisciplinary research ideas.

### References

- Konietzko, J., Bocken, N., Hultink, E. 2020. Circular Ecosystem Innovation: An Initial Set of Principles, *Journal of Cleaner Production* (253), 1-15.
- Zeiss, R., Ixmeier, A., Recker, J., Kranz, J. 2021. Mobilising Information Systems Scholarship for a Circular Economy: Review, Synthesis, and Directions for Future Research, *ISJ* (31:1), 148-183.