

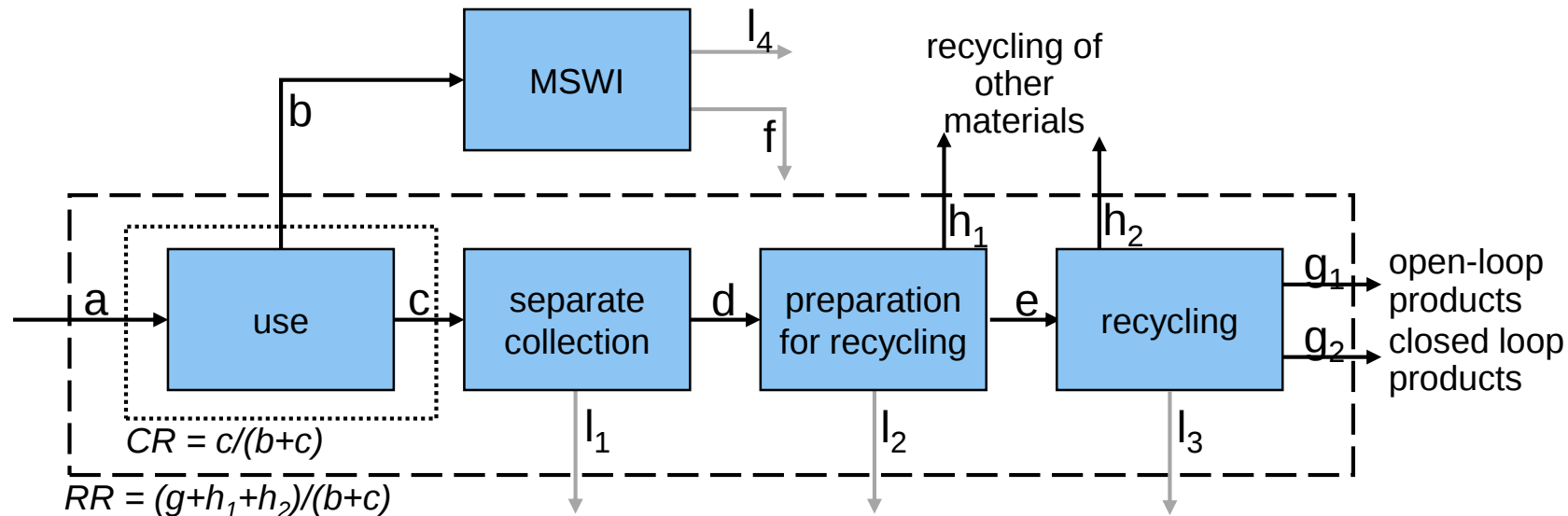


Measuring the environmental sustainability of a Circular Economy

Dr. Melanie Haupt
European Resource Forum 2020

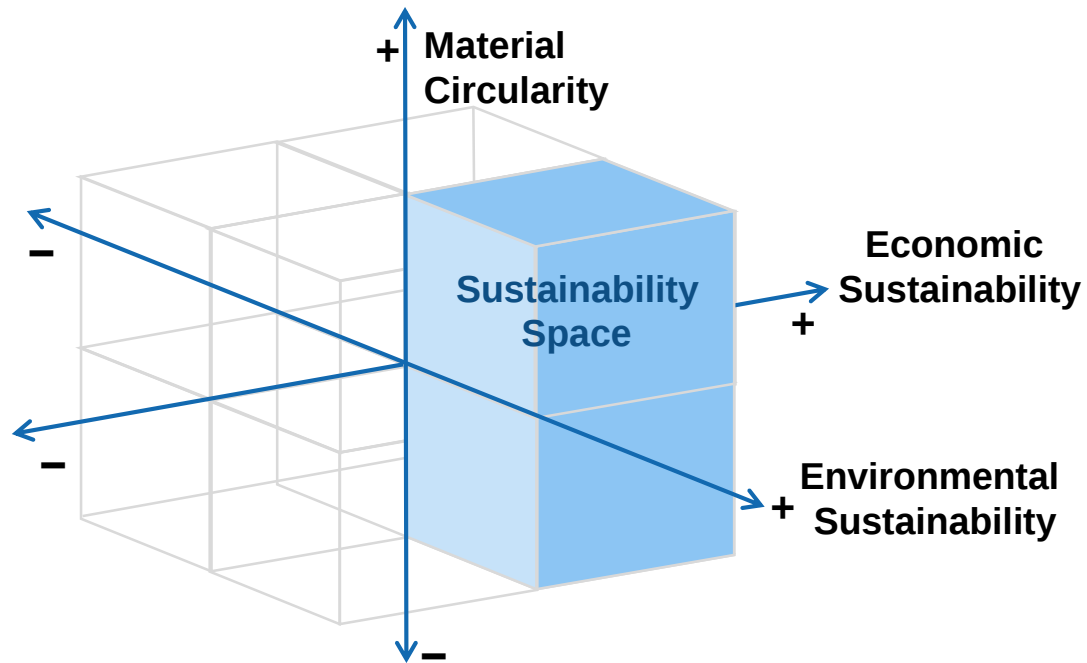
Current quantitative «Circular Economy» performance indicators...

- ... are often waste disposal indicators
- ... rarely address longevity, value change and implications on the use phase
- ... are mostly mere mass-based indicators.



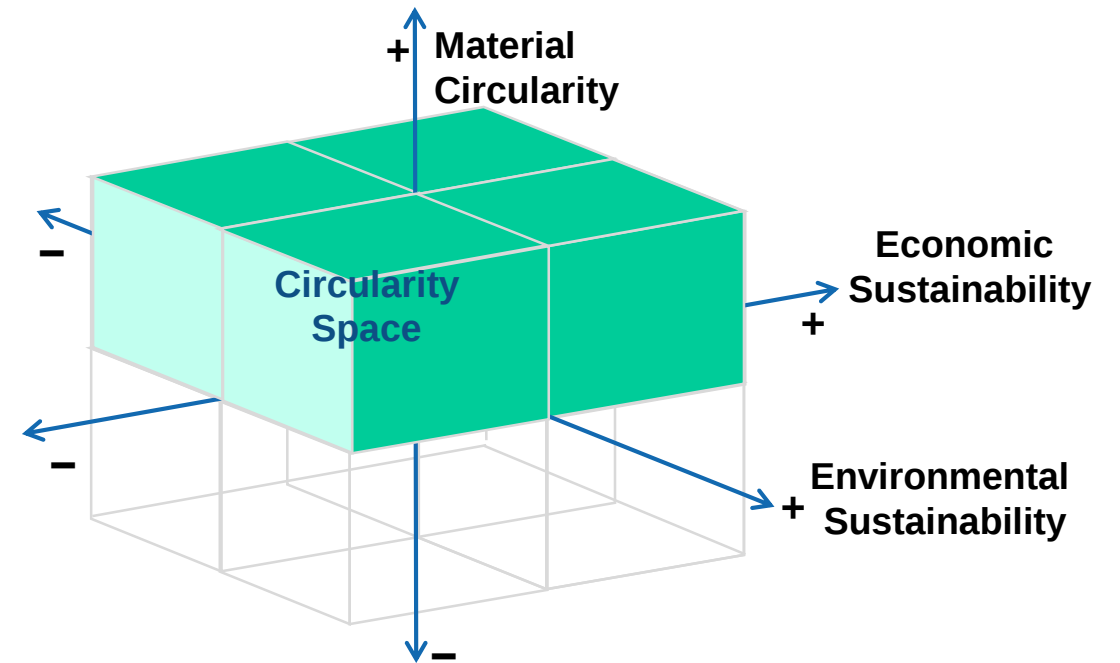
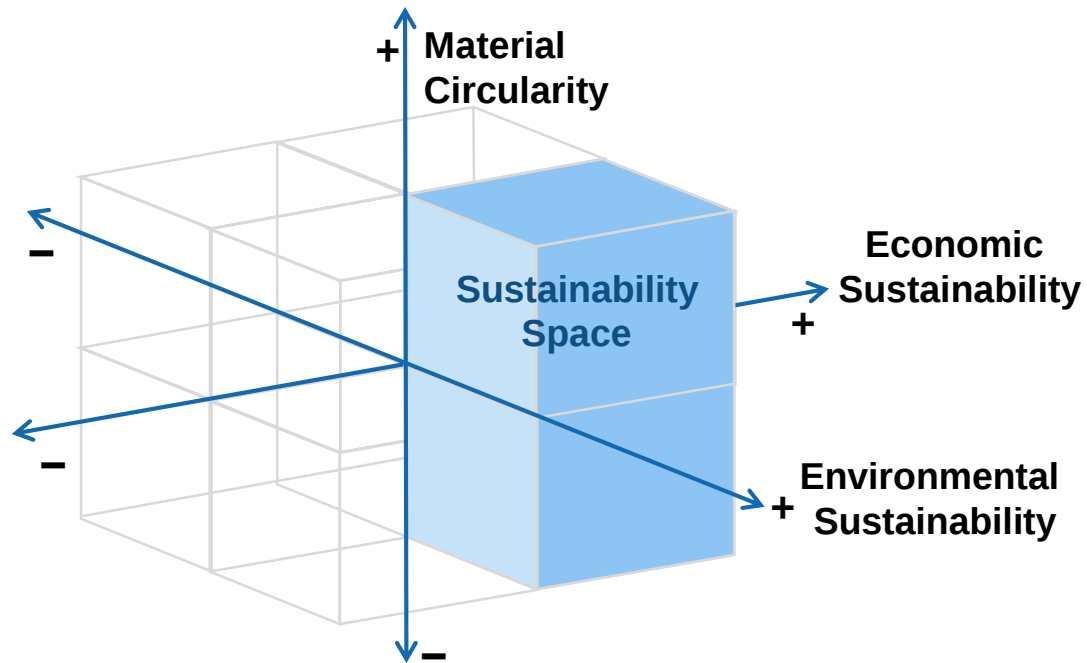
Haupt, M., C. Vadenbo, and S. Hellweg. 2016. Do we have the right performance indicators for the circular economy? Insight into the Swiss waste management system. *Journal of Industrial Ecology*. DOI: 10.1111/jiec.12506

Why are mere mass-based indicator a problem?



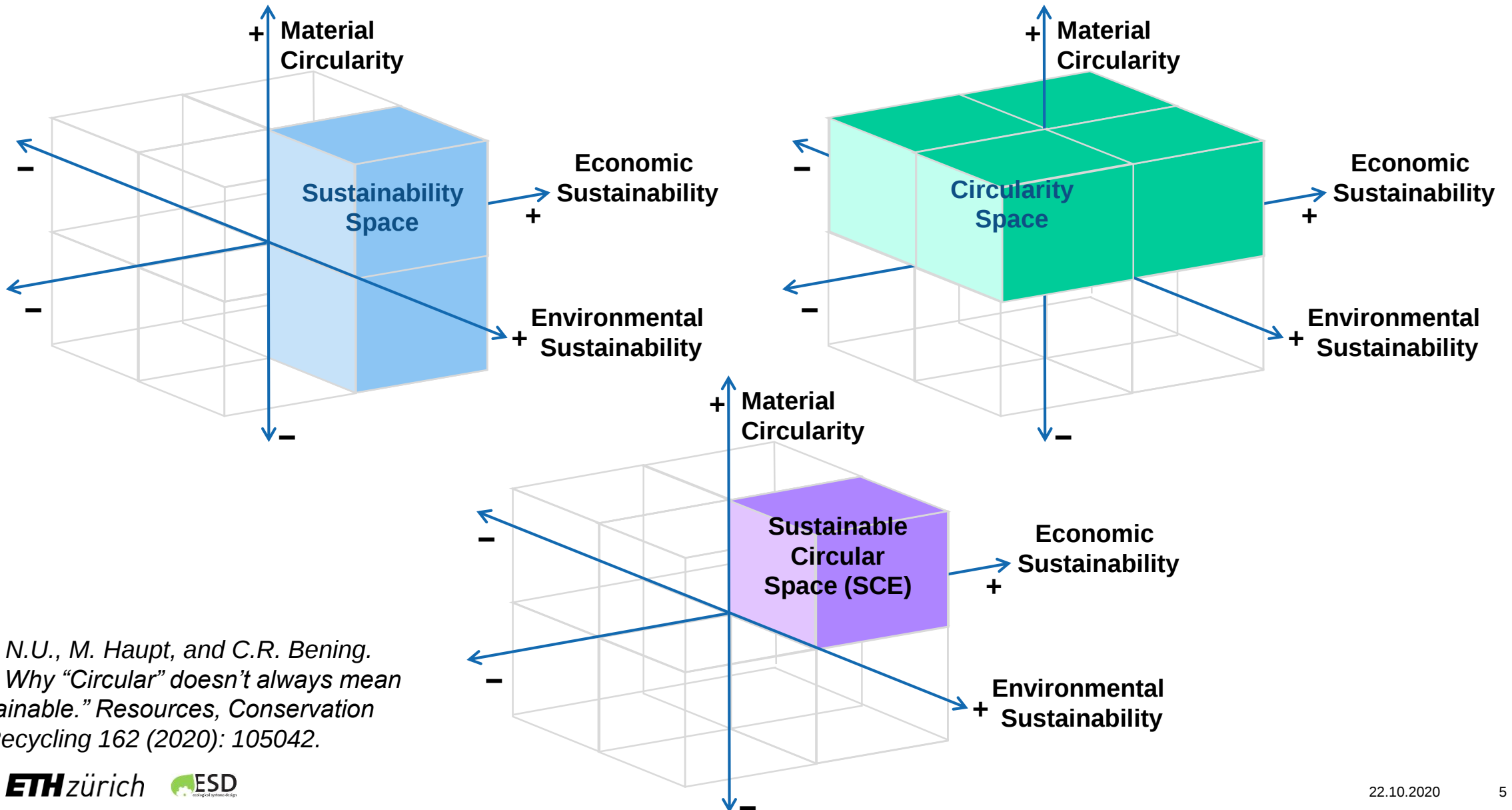
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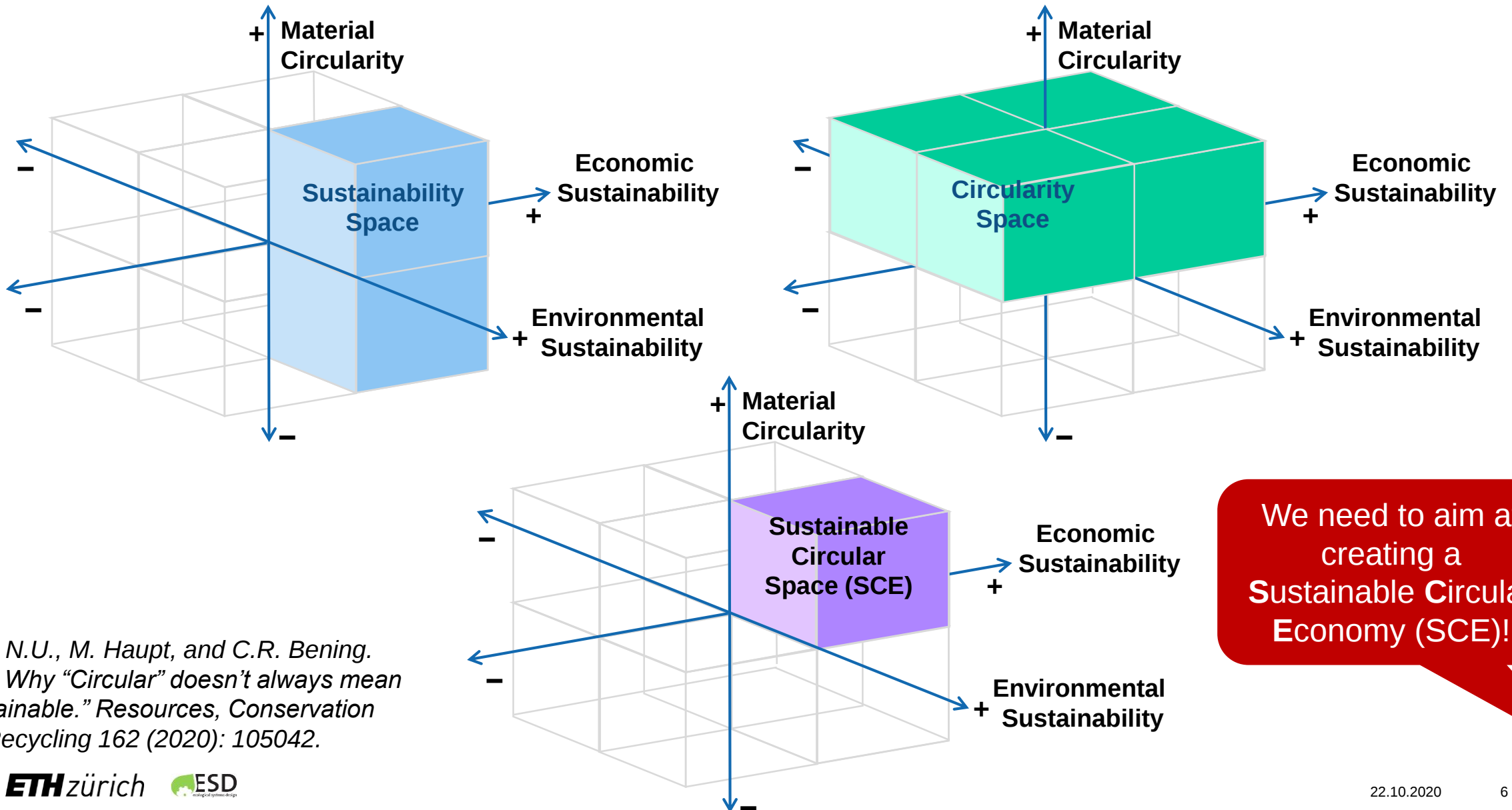
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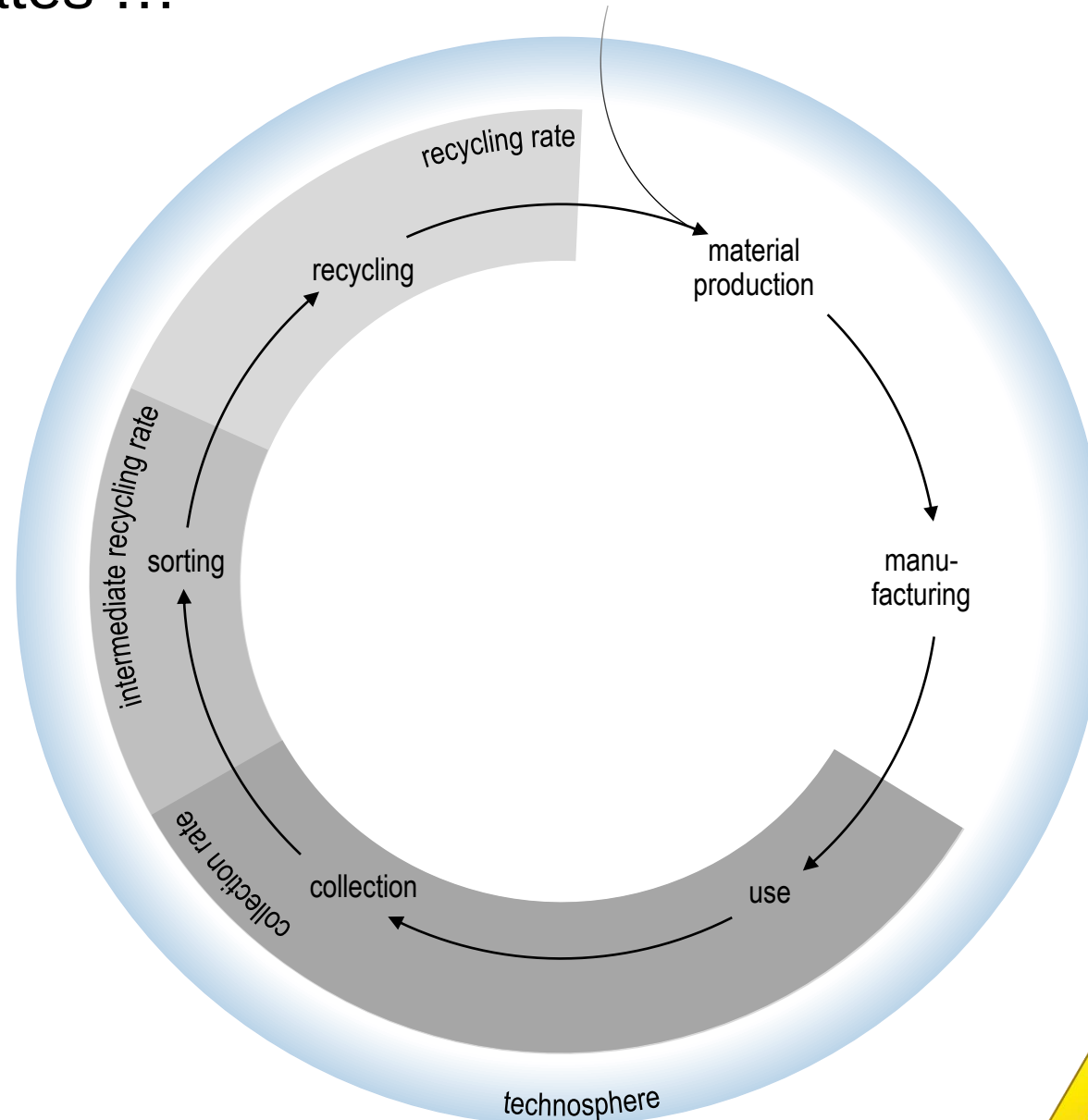
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We need to aim at creating a Sustainable Circular Economy (SCE)!

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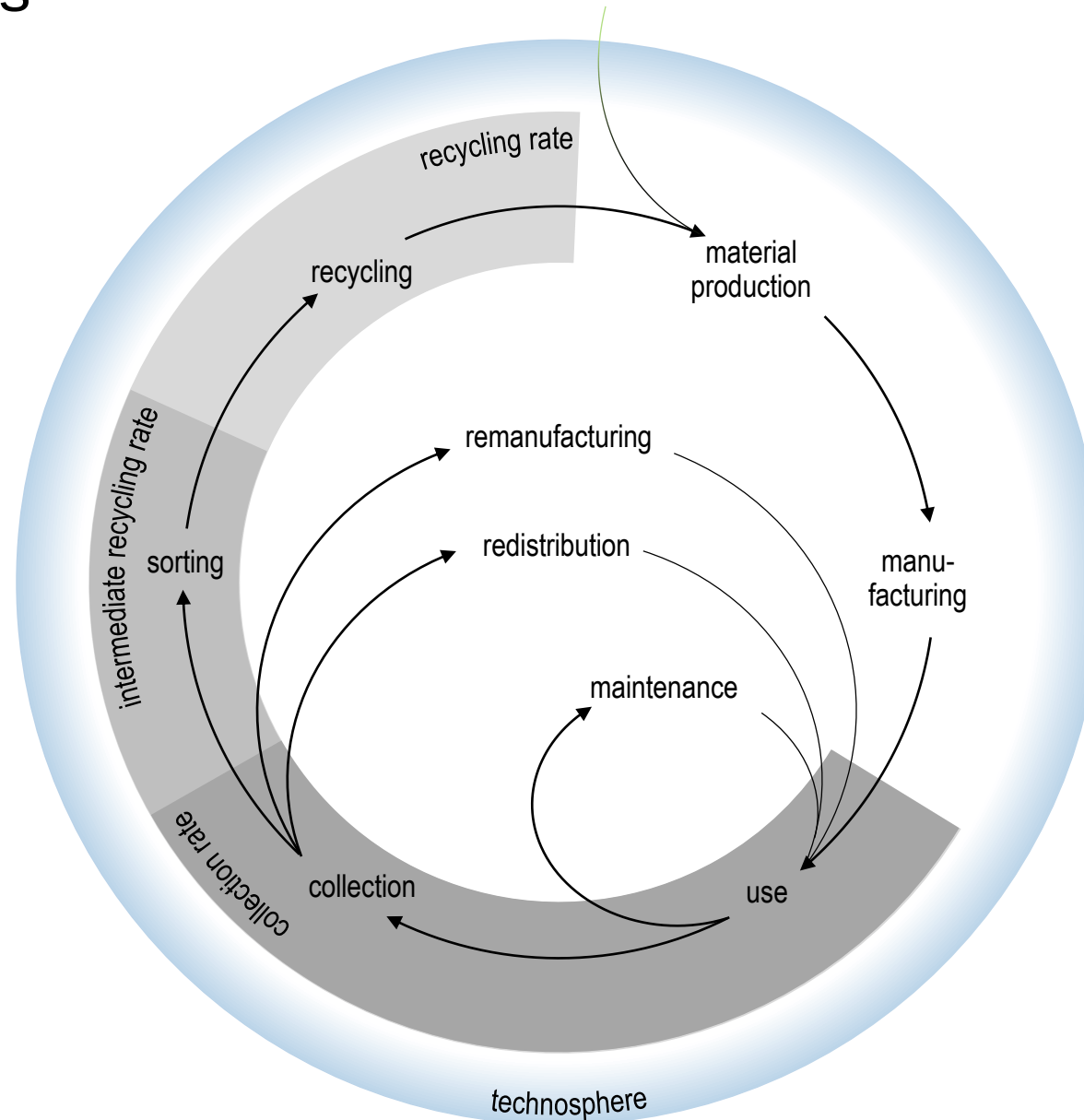
From recycling rates ...



Haupt, M. and S. Hellweg. 2019.
Measuring the environmental
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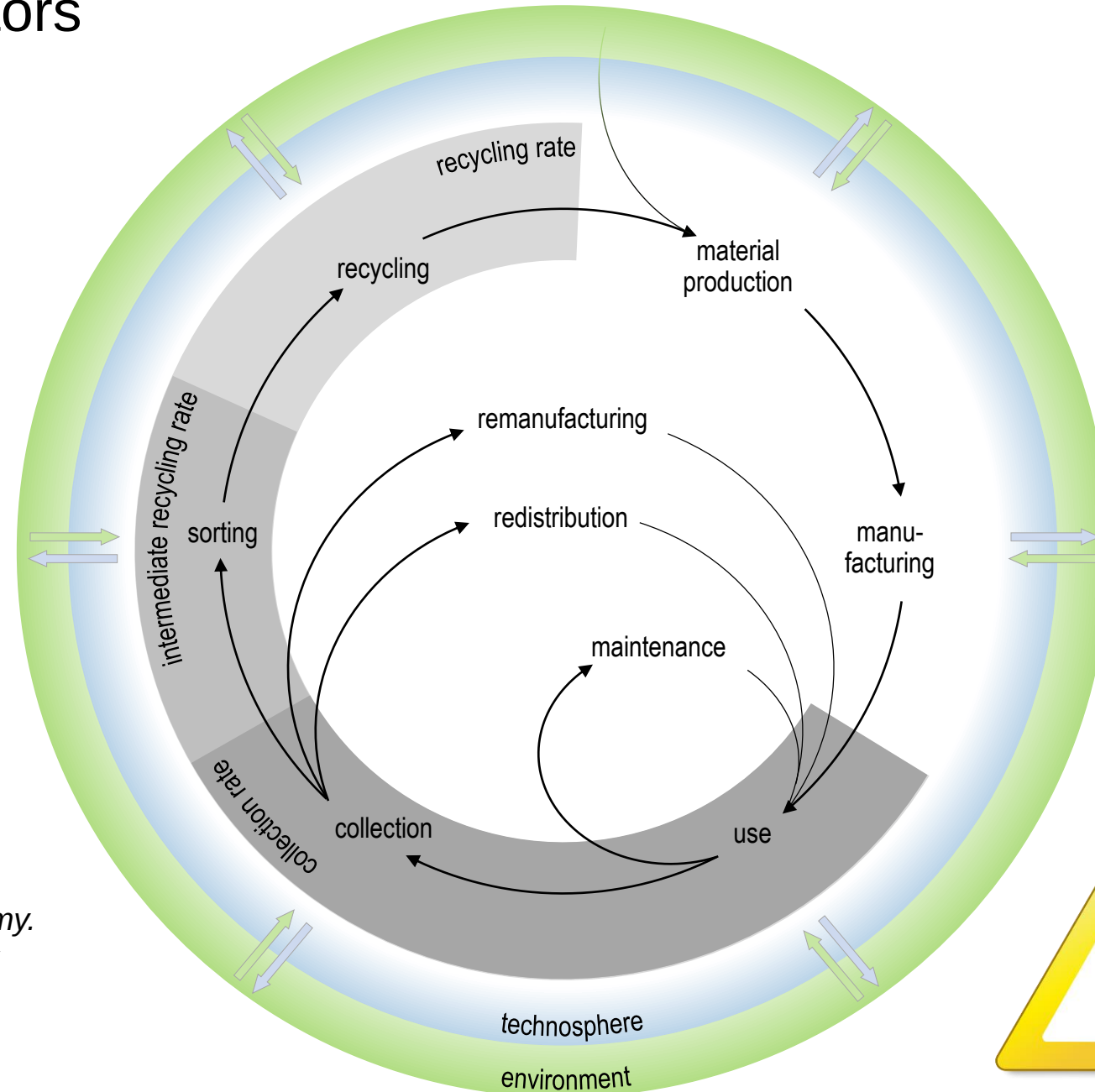


...to CE indicators



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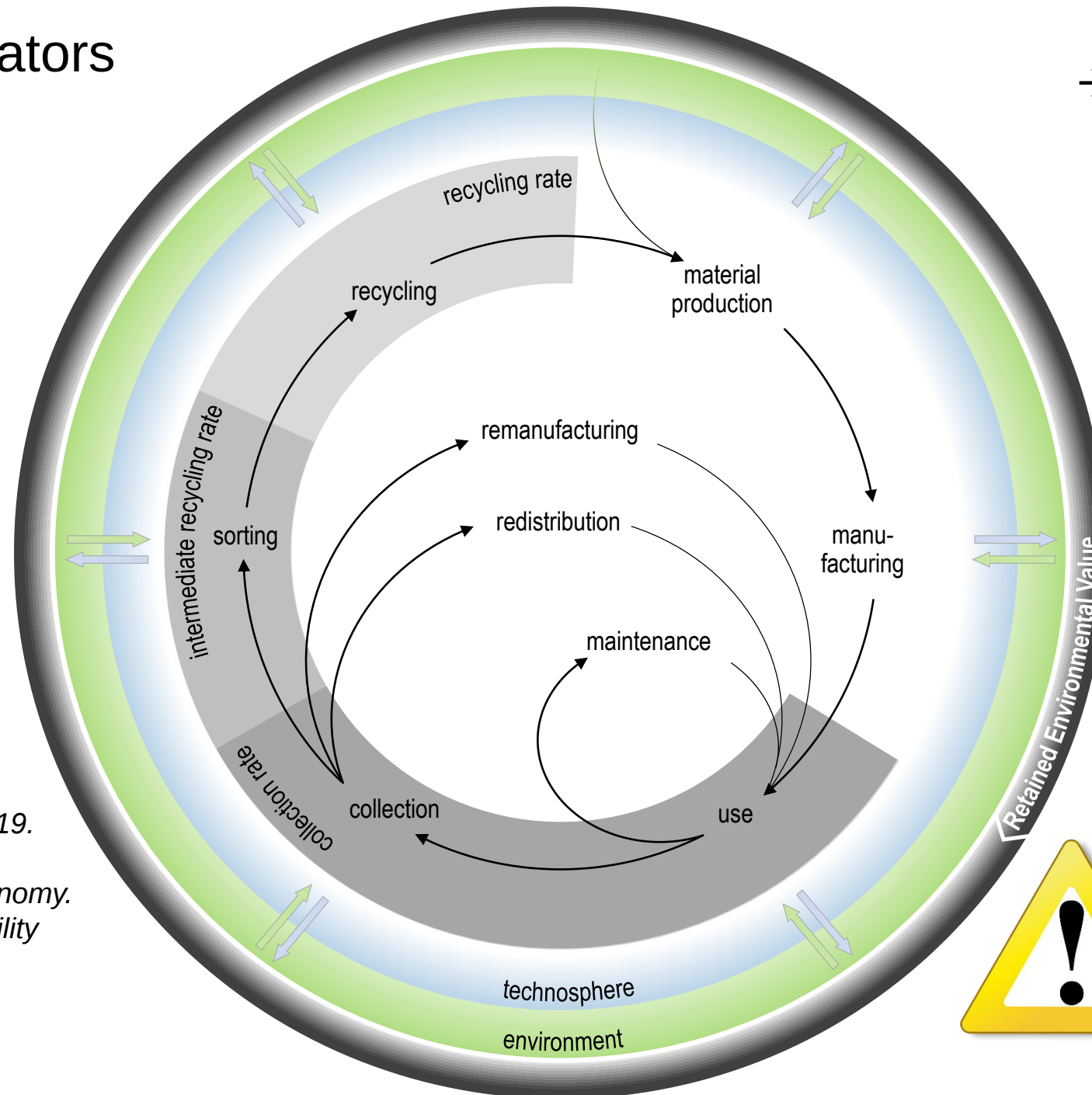


→ To warrant that the circular economy is sustainable, indicators should capture **environmental impacts** of a circular solution with a **systems view**.

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Retained environmental value (REV) indicator

The REV quantifies the share of the original environmental impact that can be retained through value retention processes

$$REV = \frac{\sum_{j=1}^n (EI_{disp,j} - EI_{vrp,j}) - EI_{surplus}}{\sum_{i=1}^n (EI_{original,i})}$$

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EI = environmental impact
REV can be implemented
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impact category (using
LCA methodology)

i and j: number
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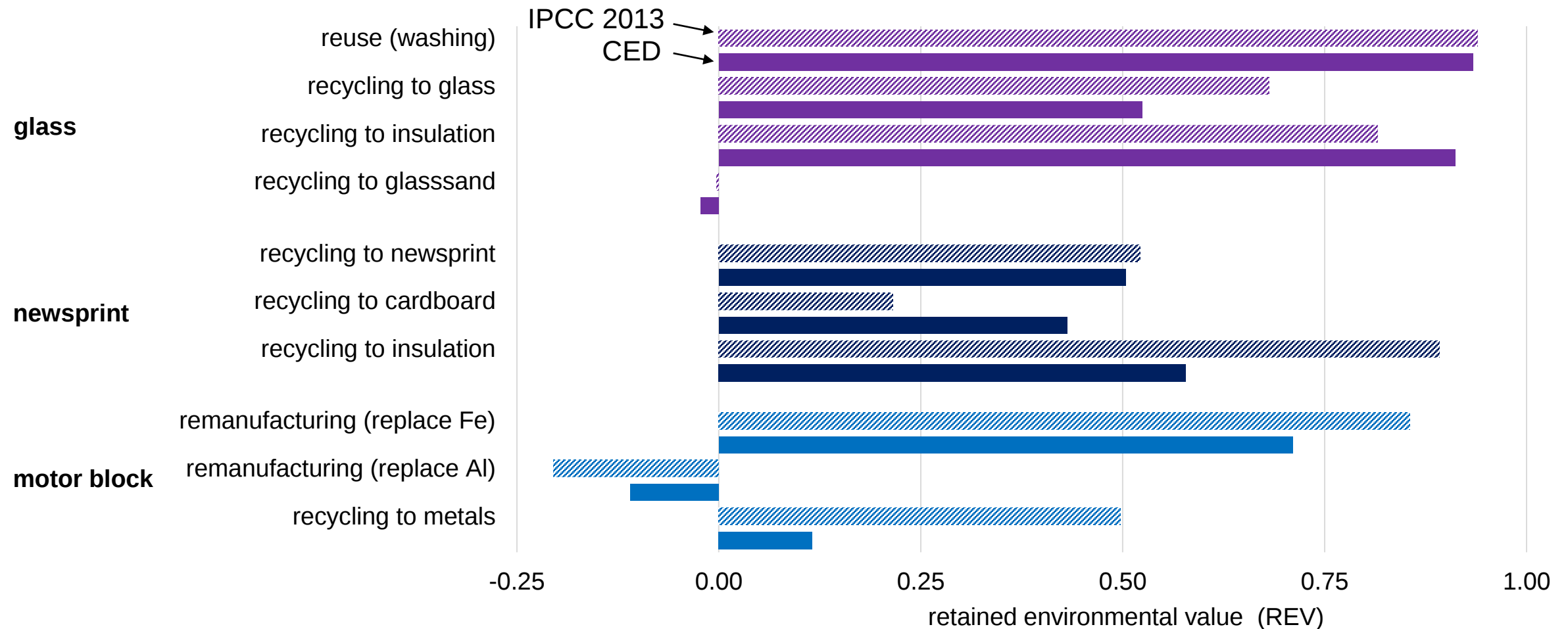
surplus = implications on later life-cycle phases

El = environmental impact
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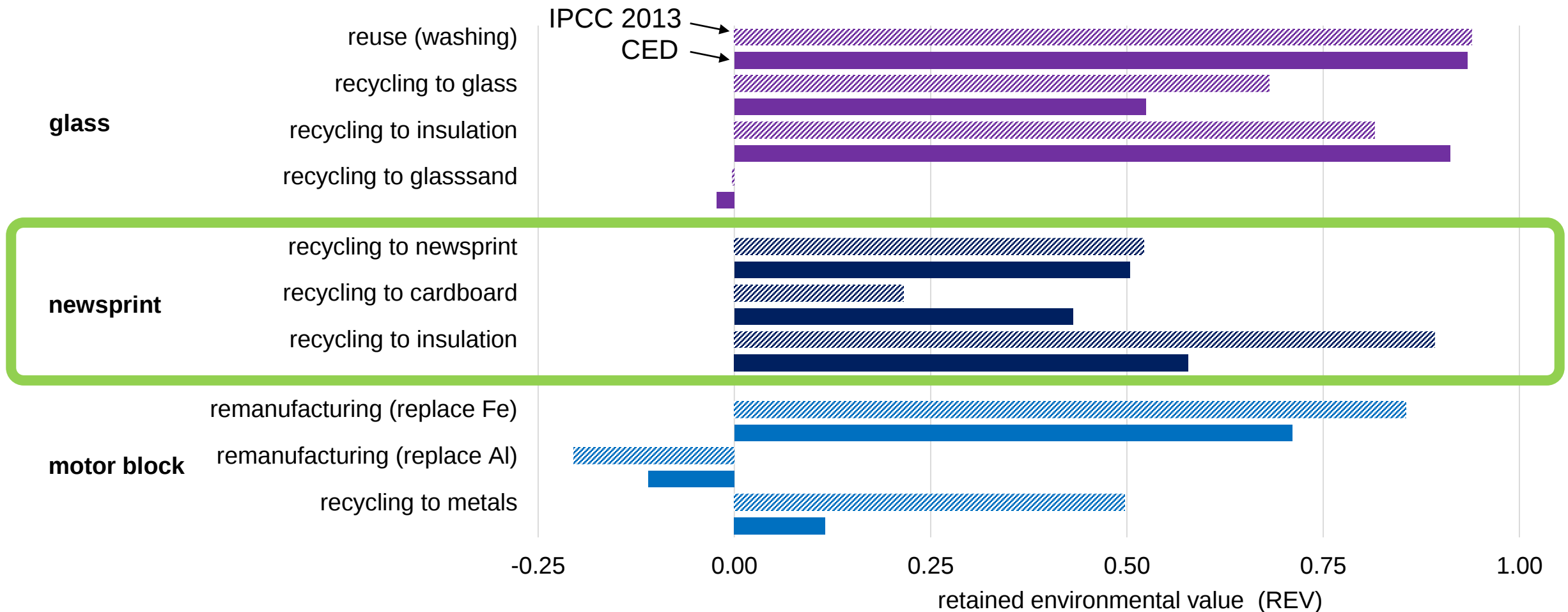
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Retained environmental value (REV) applied to value retention processes



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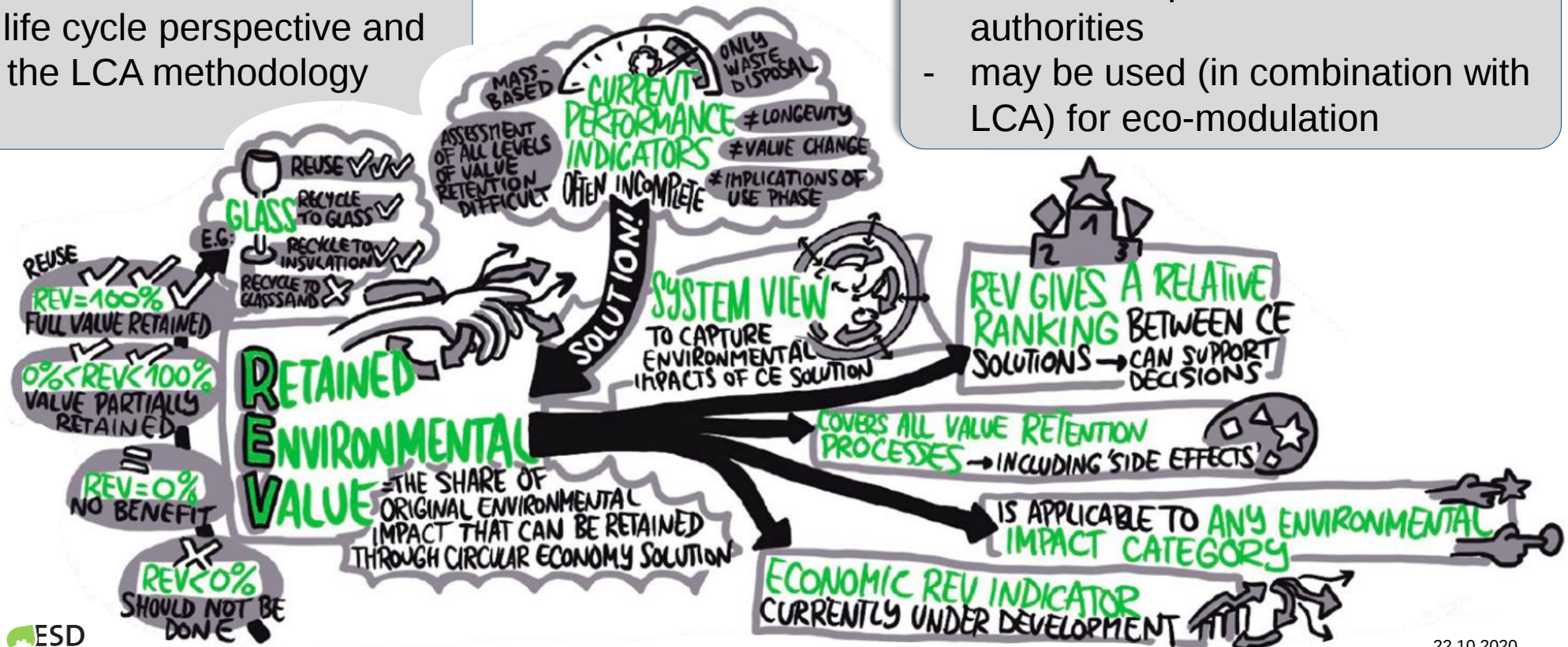
Conclusions

Methodologically, the REV

- covers all value retention processes i.e. circular strategies
- considers “side effects”, e.g. when the technology is not yet mature
- uses a life cycle perspective and follows the LCA methodology

Applied, the REV indicator

- gives relative ranking between value retention processes for products / scenarios
- can serve as decision support tool for companies, consumers, authorities
- may be used (in combination with LCA) for eco-modulation

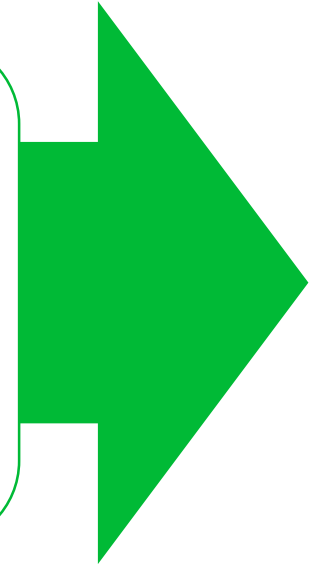


Application of REV and national target setting

Indicator and target system 2030 by Swiss Recycling
→ using REV in monitoring and target setting for waste management system

Call for action: “REV for dummies” for industry and policy, enable its use for various actors, incl. authorities and companies

Postulate by green party to **test REV for nation wide application** (on different levels) and add to, or substitute, previous indicators



National target setting:

- For Swiss Recycling systems based on previous studies and improvement potentials
- For environmental performance overall, ongoing project with Swiss Federal Office of Environment to define science based targets and evaluate current performance.

Planetary Boundaries

Allocation of PBs to sub-global scales



Actual impacts at a Country, Sector and Municipal level



Thank you for your attention!



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