Modeling recycling in LCA

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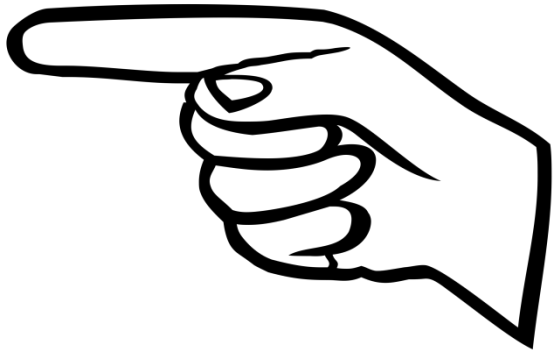
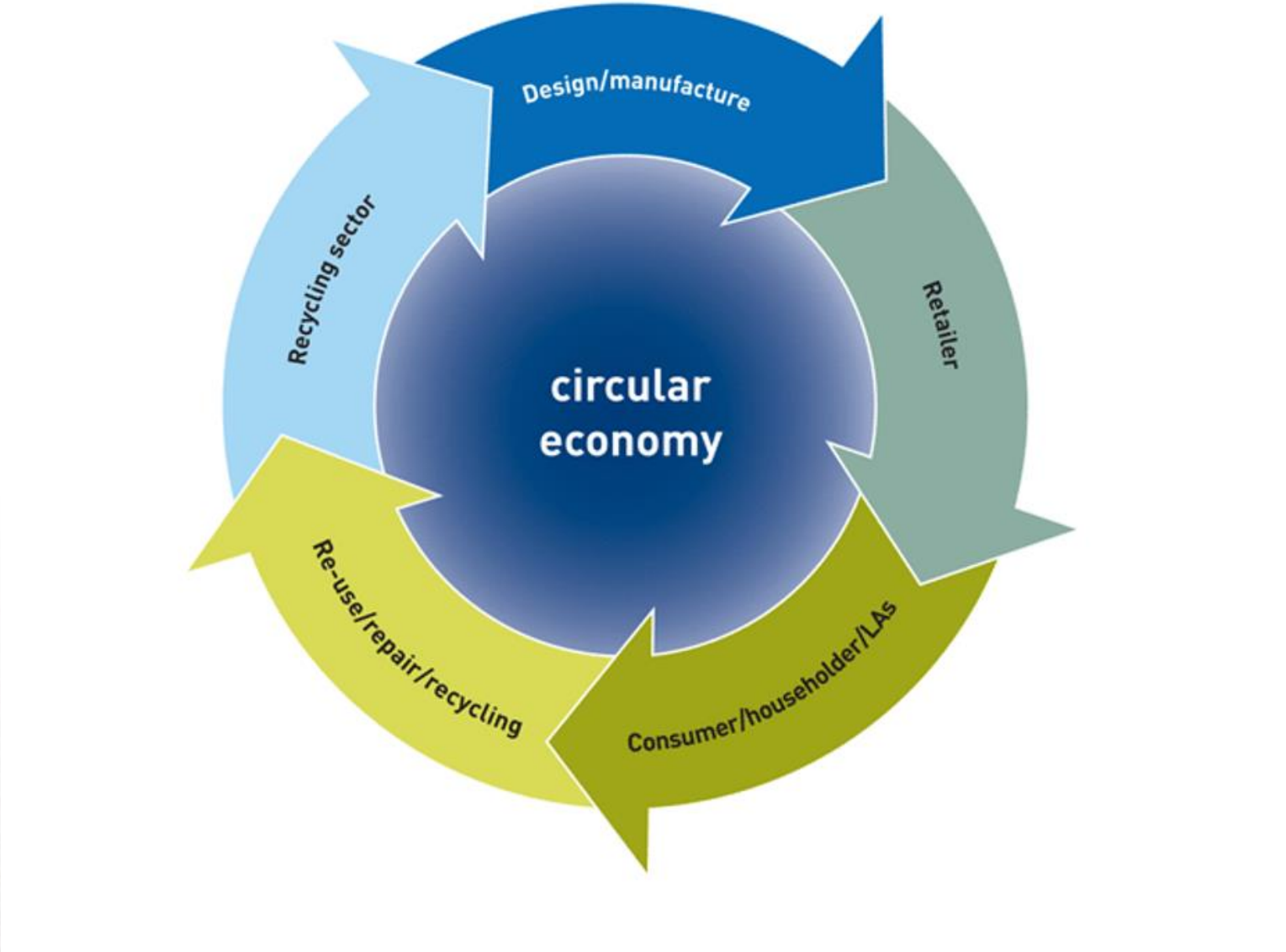
Highlights



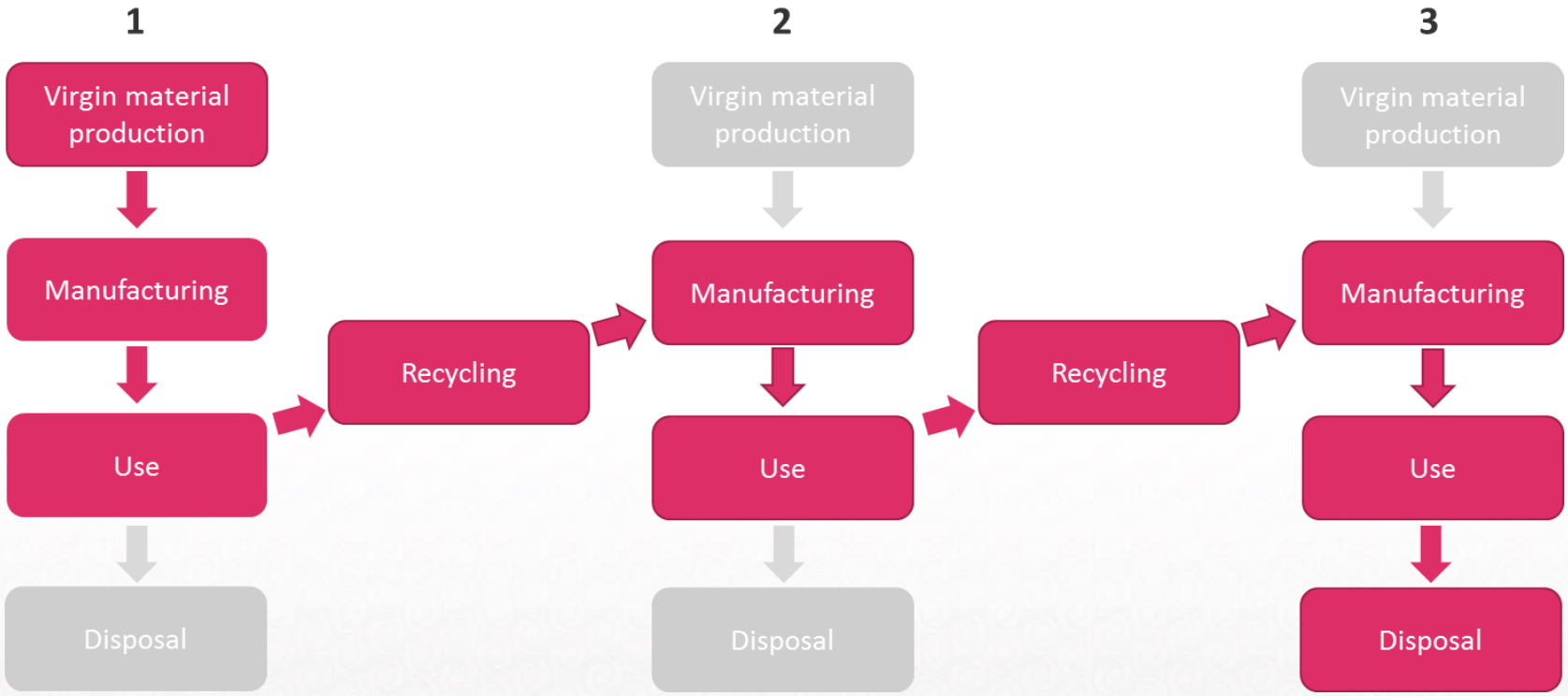
1. Criteria for good LCA methods

2. Assessment of various approaches to allocation at recycling

3. Swedish consensus process will follow



Source: Domenech 2019

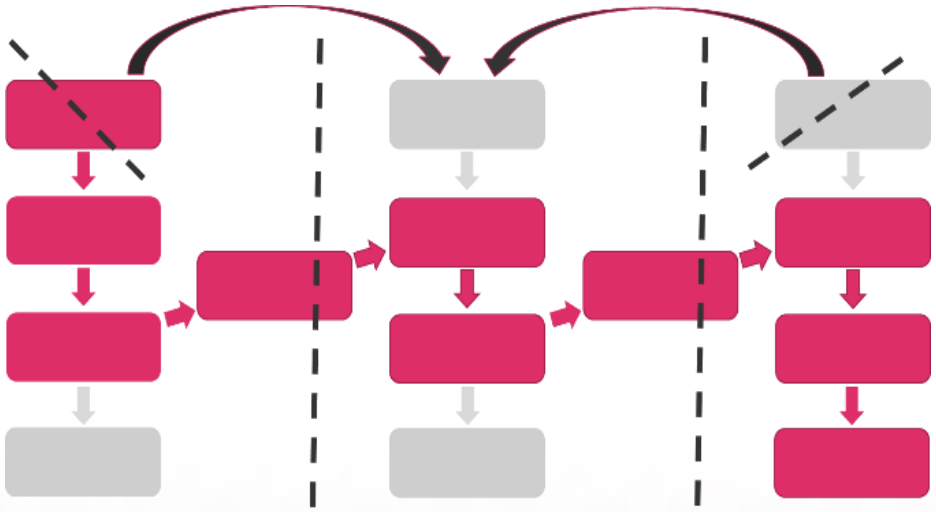


Source: Ekvall et al. 2019

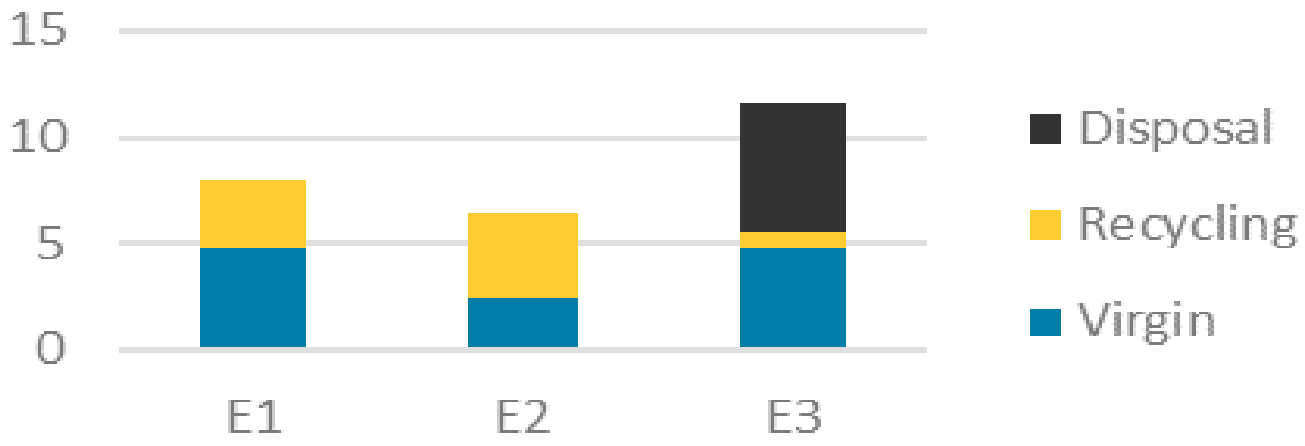
Standards	Guidelines	Scientific publications
ISO 14044 + TR 14049	PEF & OEF	Ekvall & Tillman (1997)
ISO 14067	International EPD	Ekvall (2000)
ISO 20915	Nordic Guidelines on LCA	Schrijvers et al. (2016)
EN 15804 + TR 16970	Dutch Handbook on LCA	Allacker et al. (2017)
EN 16485	UBA guide on packaging LCA	
PAS 2050	Greenhouse Gas Protocol	
	Worldsteel Association & ISSF	
	Ecoinvent	

=> 12 main approaches

Circular Footprint Formula



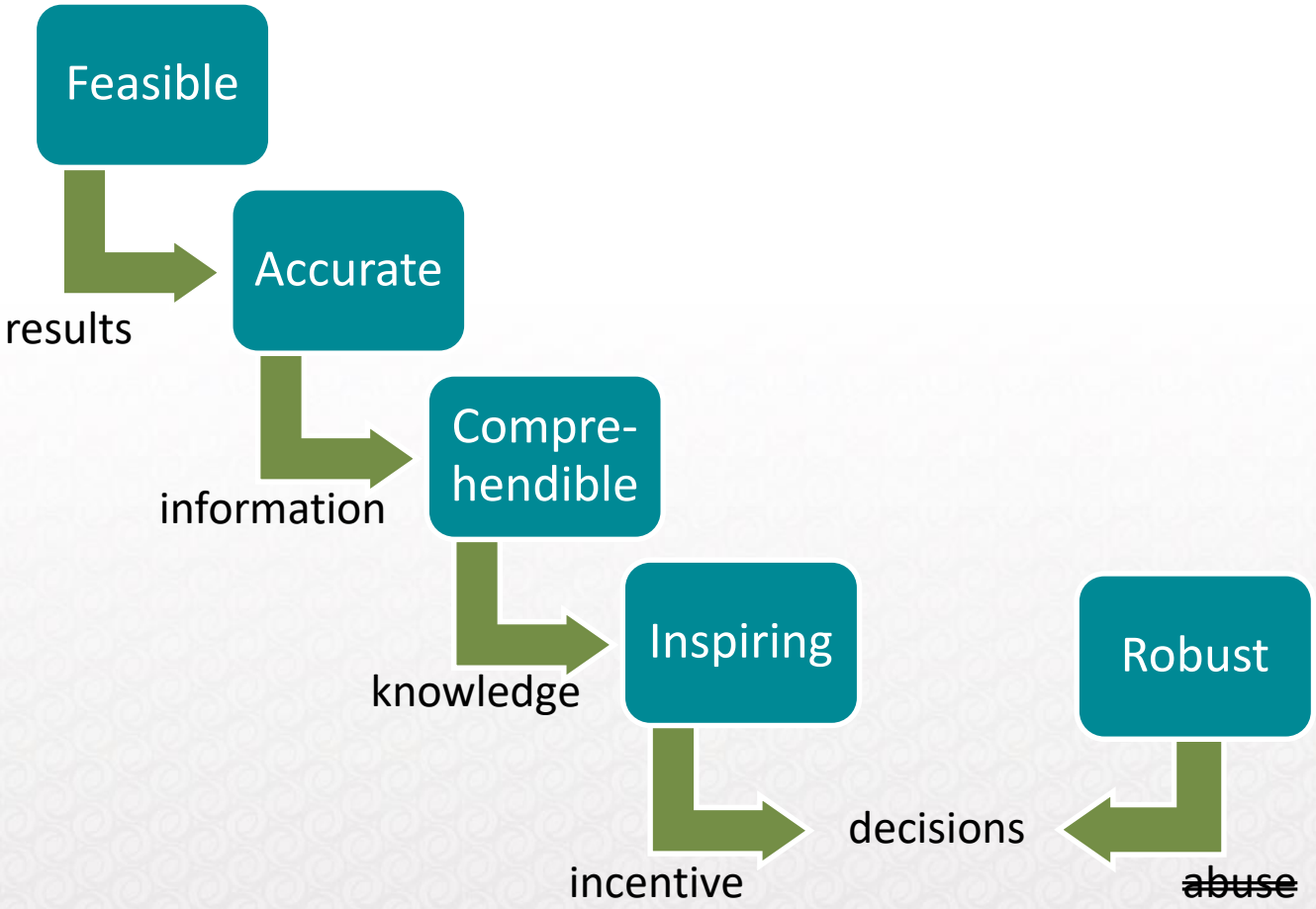
$$E = (1-R_1)\times E_V + R_1\times[AE_{Rin} + (1-A)E_V\times Q_{Sin}/Q_P$$
$$+$$
$$+ (1-A)R_2\times[(E_{Rout} - E^*_V\times(Q_{Sout}/Q_P)] +$$
$$+ (1-R_2)\times E_D$$



Criteria – starting point

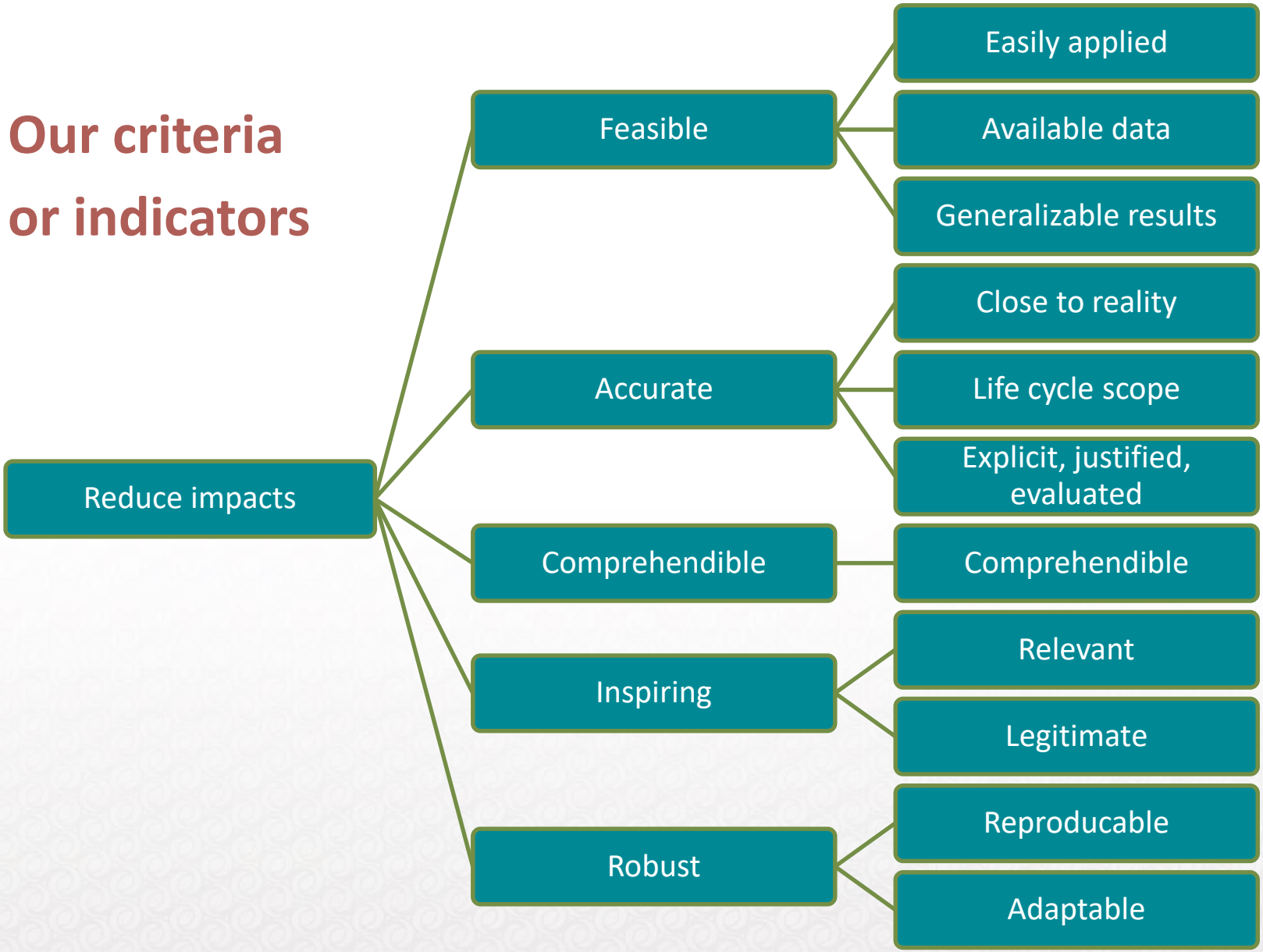
LCA should contribute to reducing environmental impacts

Previously derived criteria



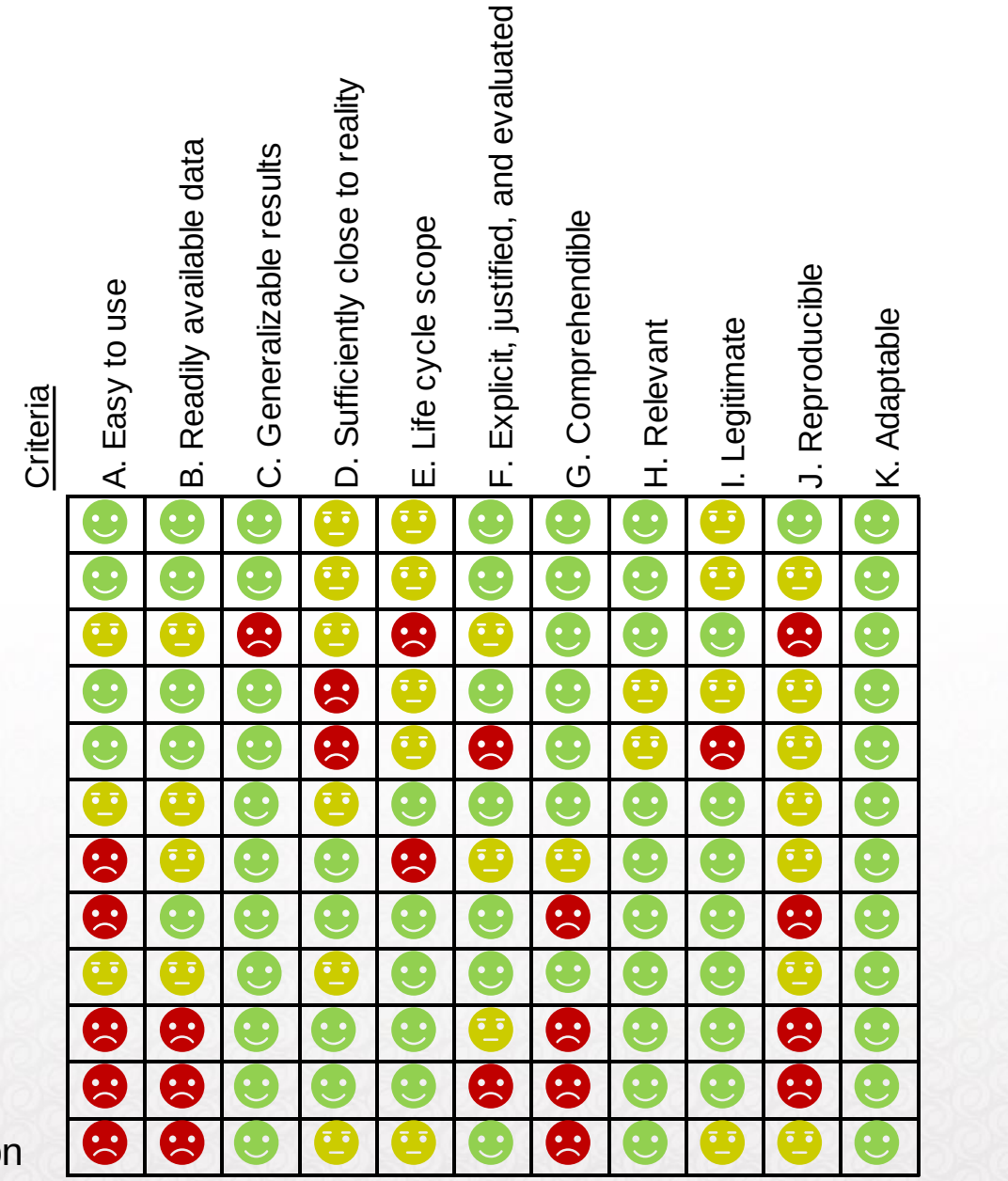
Source: Ekvall et al. 2004

Our criteria or indicators



Source: Ekvall et al. 2019

Tentative assessment results



The project continues…

- Case studies in industry (ongoing)
- Revised assessment
- Consensus process

Funding:
Swedish Energy Administration
Re:Source Programme

Consortium

Coordination:
Swedish Life Cycle Center

Extended working group:

Research group:
Chalmers University of Technology
IVL Swedish Environmental Research Institute
Royal Institute of Technology

Case-study partners:
Essity
SSAB
Outokumpu
Volvo
Tetra Pak
RISE/Miljögiraff

Vattenfall
Volvo Cars
Nouryon
Stena Recycling

Jernkontoret
Swedish Environmental Protection Agency
Swedish Transport Administration

Thanks for the attention!

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