

**Table 1.** Analysis regarding eco-efficiency and eco-effectiveness

Topic-group	Article	Eco-efficiency	Eco-effectiveness
Product development methods	Brusa et al. (2024)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Evrard et al. (2021)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Favi et al. (2021)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Filippatos et al. (2024)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Fontana et al. (2024)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Hildenbrand et al. (2021)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Joustra et al. (2022)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Jugend et al. (2020)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Lindkvist Haziri and Sundin (2020)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Meldrum (2023)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Peralta et al. (2020)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Riesener et al. (2023)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Rio et al. (2020)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Rocha et al. (2023)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Rotondo et al. (2025)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Sedini et al. (2024)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Shevchenko et al. (2024)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Siwiec et al. (2023)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Tellez Nitzling et al. (2024)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Vicente and Camocho (2024)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Assessment tools	Aguiar and Jugend (2022)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Aher et al. (2023)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Boix Rodríguez and Favi (2024)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Cappelletti and Germani (2024)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Fang et al. (2024)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Karkasinas et al. (2025)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Ko et al. (2024)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	König et al. (2025)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Palsodkar et al. (2024)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Pluhnau et al. (2023)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Ruiz-Pastor et al. (2022)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Saidani et al. (2020)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Saidani and Kim (2021)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Design rules	Azua Lahidalga et al. (2024)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Fröhlich (2024)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Hakola et al. (2024)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Hoveling et al. (2024)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Joustra et al. (2021)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Mesa (2023a)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Sangwongwanich et al. (2024)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Stölzle et al. (2023)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Toxopeus et al. (2018)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	van Doorsselaer (2022)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Willskytt and Brambila-Macias (2020)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Barriers/drivers	Bakker et al. (2010)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Boorsma et al. (2022)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Chouinard et al. (2019)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Da Silva et al. (2024)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Dorrego-Viera et al. (2025)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Horn et al. (2023)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Kane et al. (2018)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Nekin et al. (2024)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Pauw et al. (2013)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Ries et al. (2023)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Material selection	Desing et al. (2021)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Mardina et al. (2025)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Mesa (2023b)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Papile and Del Curto (2024)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Business models	Cappelletti et al. (2024)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Pruhs et al. (2024)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Wastling et al. (2018)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

**Legend:** ☒: approach addressed; ☐: approach not addressed