

Sustainable Transformation & CE

- 221 Definition – Kirschherr et al, 2023
- Circular Economy
 - Focus on Action – Toolkit
 - slow – narrow – close – regenerate – inform (Konietzko, Bocken & Hultink, 2020)
 - Material & Energy flows
 - Pollution & toxicity
 - Use of Natural resources – land – water – sea
- Sustainability – Goal of CE
 - Focus on the result

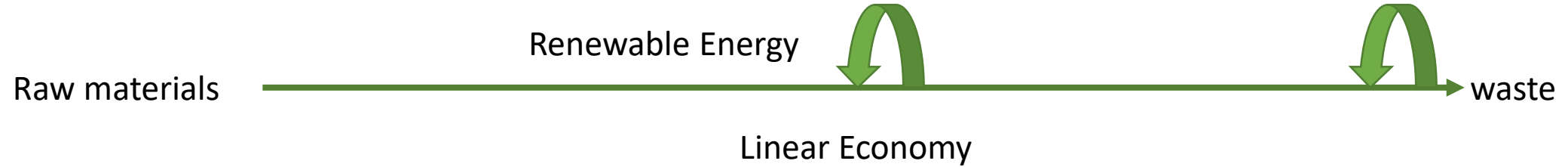
Innovation for CE

- CE & Innovation (de Jesus et al., 2017)
- Technological Innovation
- Product and Process design (Sumter et al., 2017)
- Social innovation (van der Have and Rubalcaba, 2016)
- Business Model innovation (Bocken et al., 2018)
- Supply/value Chain Innovation (Bicket et al., 2014)
- Policy (McDowall et al., 2017)
- Regions (Hermelin and Rämö, 2017)

CE Innovation bundles

(Barrett et al, 2022; Byson, 2010; Bathelt et al. 2013)

Business Activities



Low level or Missing

- Innovation Bundles
- Business Model change
- Systemic change

Innovation – Circular - Collaboration

Collaboration – **Complexity** – actors

Linear

Circular

Within Firm
Add recycling
Green energy

Mainly Internal
Cooperation

Supply Chain
CE business model
Design for CE

Supply Chain
Cooperation

System change
CE value chain
CE society

Value Chain
Public Actors
Customers

Innovation

Often incremental
Firm level
Technology change

Bundles of innovation
Business Model,
technology, digitalisation,
data

Across society
Regulation,
consumption,
economic system

Circular Innovation Systems

- **Regional Policy** (Arauzo-Carod, et al. 2022; Albrecht, Grundel & Morales, 2021)
- **Path Development → Circular Systems**
 - Indigenous – Exogenous Knowledge (Trippel, Grillistch & Isaksen, 2018)
 - Inter-Regional Knowledge (Ejermo & Karlsson, 2006; Hjaltadottir et al, 2020)
- **RIS for CE**
 - Level of Cooperation
 - Non-technological Innovations
 - CE supply Chain development (Ricciotti, 2020; Berardi & de Brito, 2021)
- **Communities of Transformation** (Kezar et al, 2018)
 - Drivers of collaboration and change

System Change – Path Development

CE Innovations

Local context


Resources
Industries
Knowledge

Agency

Policy
Communities of Transformation
Risk

RIS

Innovation
Bundles



Circular Systems - BRAVE

B – Bundles of Innovations

R – Regional Innovation systems

A – Agency & CoT

V – Values & Inclusive development

E – Economic systems & Institution

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