

AGFO-601

Circular, green and bioeconomy

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ISSUE AT HAND



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CE, GE and BE are currently mainstreamed in academia and policy making as sustainability avenues.

Different assumptions and operationalization strategies.

Multiple actors adopt the concepts as they gain political momentum, or as they can legitimise their interests and activities.

Research, industry and policy implementation require understanding of synergies and limits.

PRESENTATION OVERVIEW

1. Comparative analysis of circular, green and bioeconomy: results from D'Amato et al. 2017
2. Considerations in policy making
3. Considerations for businesses

1. Comparative analysis (D'Amato et al. 2017)

D'Amato, D., Droste, N., Allen, B., Kettunen, M., Lähtinen, K., Korhonen, J., Leskinen, P., Matthies, B.D., Toppinen, A. 2017. **Green, Circular, Bio economy: a comparative analysis of three sustainability concepts**. J. Clean. Prod. 168: 716-734.

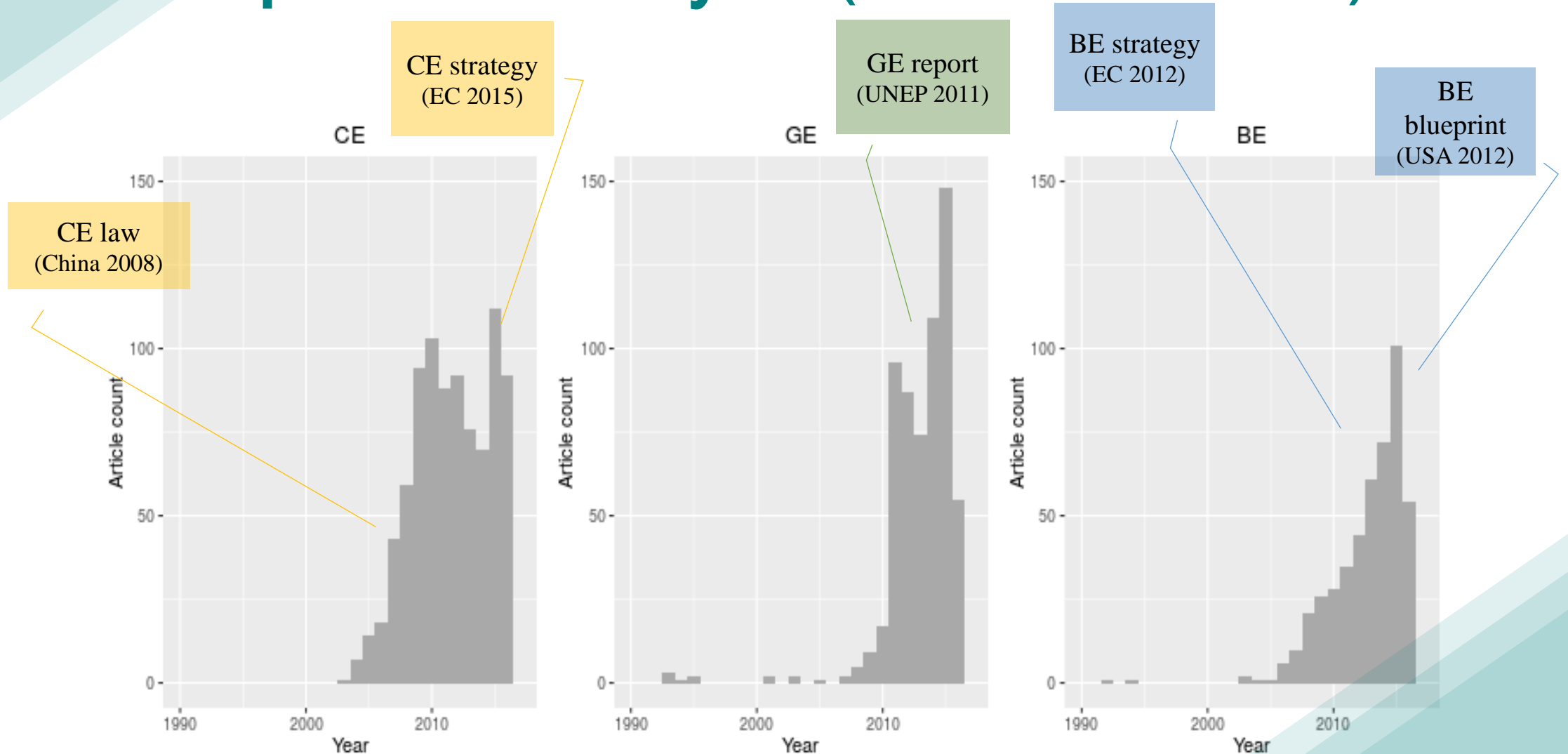
Review of almost 2000 scientific articles from CE, GE and BE literature, using text analysis*.

The software identifies keywords and topic clusters based on words frequencies.

The method allows to perform content analysis on a large amount of text wording.

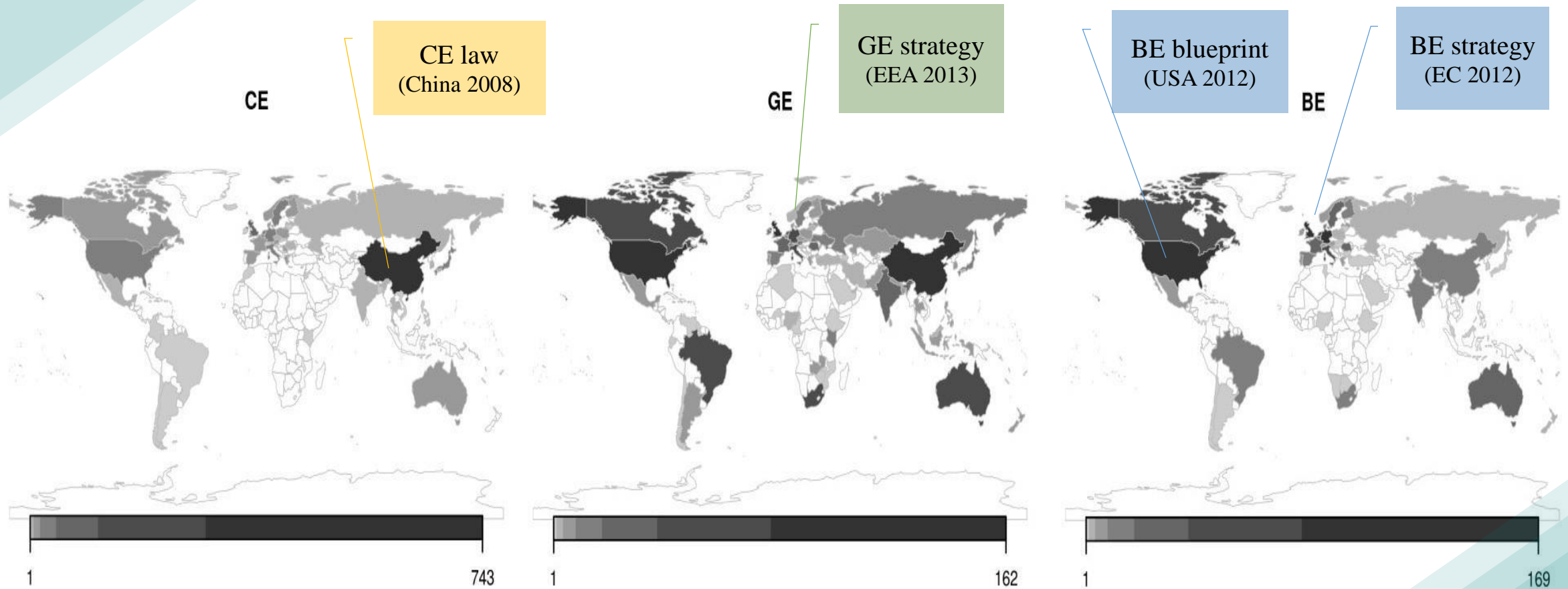
*latent Dirichlet allocation (LDA)

1. Comparative analysis (D'Amato et al. 2017)



Literature distribution in time

1. Comparative analysis (D'Amato et al. 2017)



Literature distribution in space

1. Comparative analysis (D'Amato et al. 2017)

BIOECONOMY
Biobased energy and material
through knowledge and innovation

Territorial
resilience

**GREEN
ECONOMY**
Nature-based solutions,
conservation

Industrial
symbiosis

Clean tech

**CIRCULAR
ECONOMY**
Efficiency and recycling in
production systems

Pfau et al. 2014,
Hausknot et al 2017

D'Amato et al. 2017,
Loiseau et al. 2016

Murray et al. 2015,
Martins 2016

1. Comparative analysis (D'Amato et al. 2017)

Bezama 2016,
Vis et al 2016

Overlaps	Divergences	Shared limits	Synergies
Energy, emissions and natural resources utilization; Eco-efficiency.	CE and BE resource-centred, while GE addresses all natural processes; CE focussed on urbanization and BE on rural development.	Fail to question the growth paradigm; Incomplete in addressing all aspects of sustainability dimensions.	Circular bioeconomy; GE as an umbrella concept.

1. Comparative analysis (D'Amato et al. 2017)

Great internal diversity of GE and BE.

GE is the most inclusive concept.

The concepts do not question economic growth.

Synergies should be sought to complement the individual concepts.

2. Considerations for policy making

Need to clarify and connect CE, GE and BE concepts and strategies.

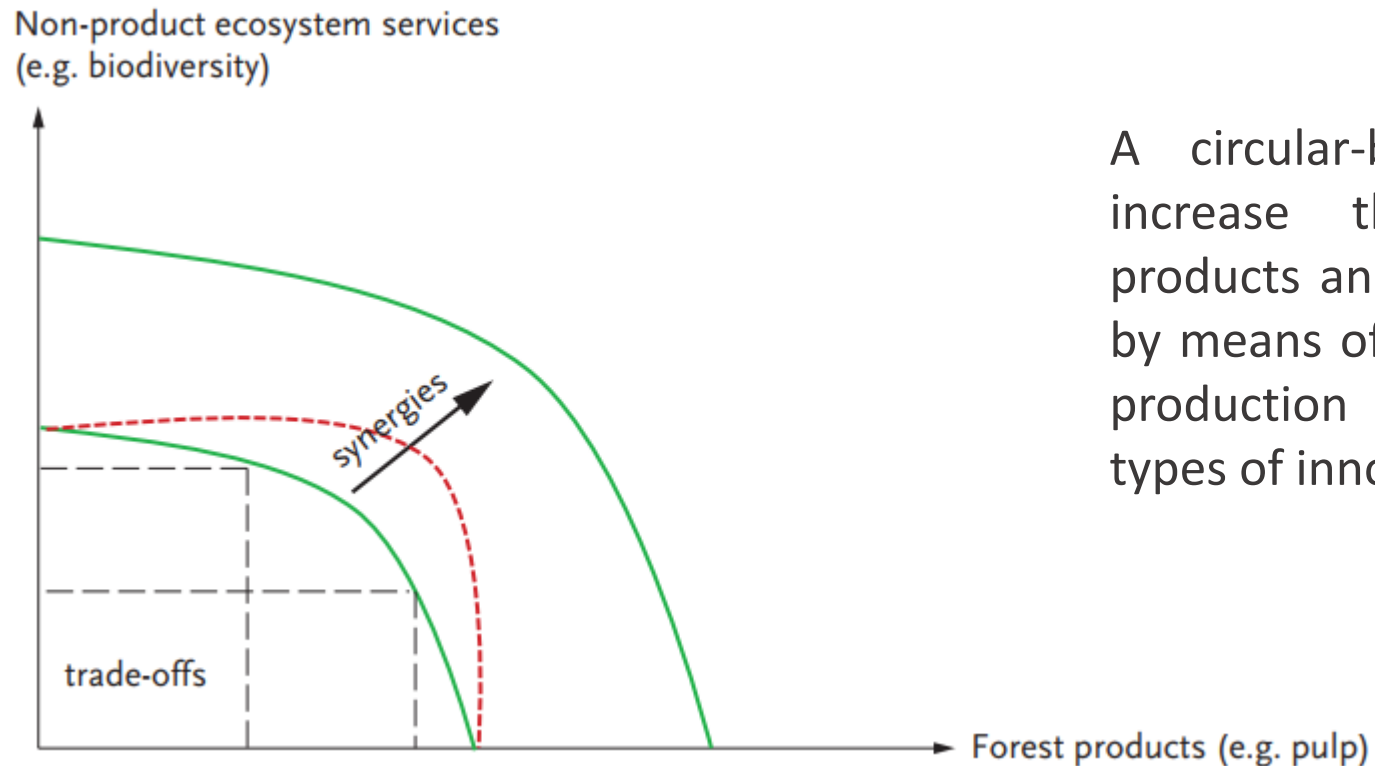
“At a policy level, this confusion can be decreased by interpreting all these concepts as tools that seek to achieve the SDGs and Paris Agreement targets.”

“Policymakers cannot just advance all possible bioeconomy developments, but rather those that also satisfy the circularity requirements. In an EU context, the merging of bioeconomy and circular economy concepts could create administrative and resourcing synergies and help to decrease ‘silo’ thinking and operation.” (Hetemäki et al., 2017, p. 16).

Coordination and synergies to be sought between the following policy areas (Hetemäki et al., 2017):
Innovation Circular and Bioeconomy, Biodiversity conservation, Land-use

2. Considerations for policy making

There is need connect CE and BE to natural capital, biodiversity and ecosystem services (Marchetti et al., 2015; Székács, 2017)



A circular-bioeconomy can contribute to increase the synergies between forest products and non-product ecosystem services by means of land use optimization, increasing production inputs, technological and other types of innovation.

2. Considerations for policy making

Holistic and long-term approaches to corporate sustainability are often missing.

Focus on reduction of energy/material inputs and outputs, renewables, eco-innovations, eco-efficiency (Bocken et al., 2014).

Ecological limits, and regulating and cultural processes delivered by ecosystems are poorly assessed (Whiteman et al., 2013).

Need for improved and more inclusive corporate reporting guidelines and indicators.

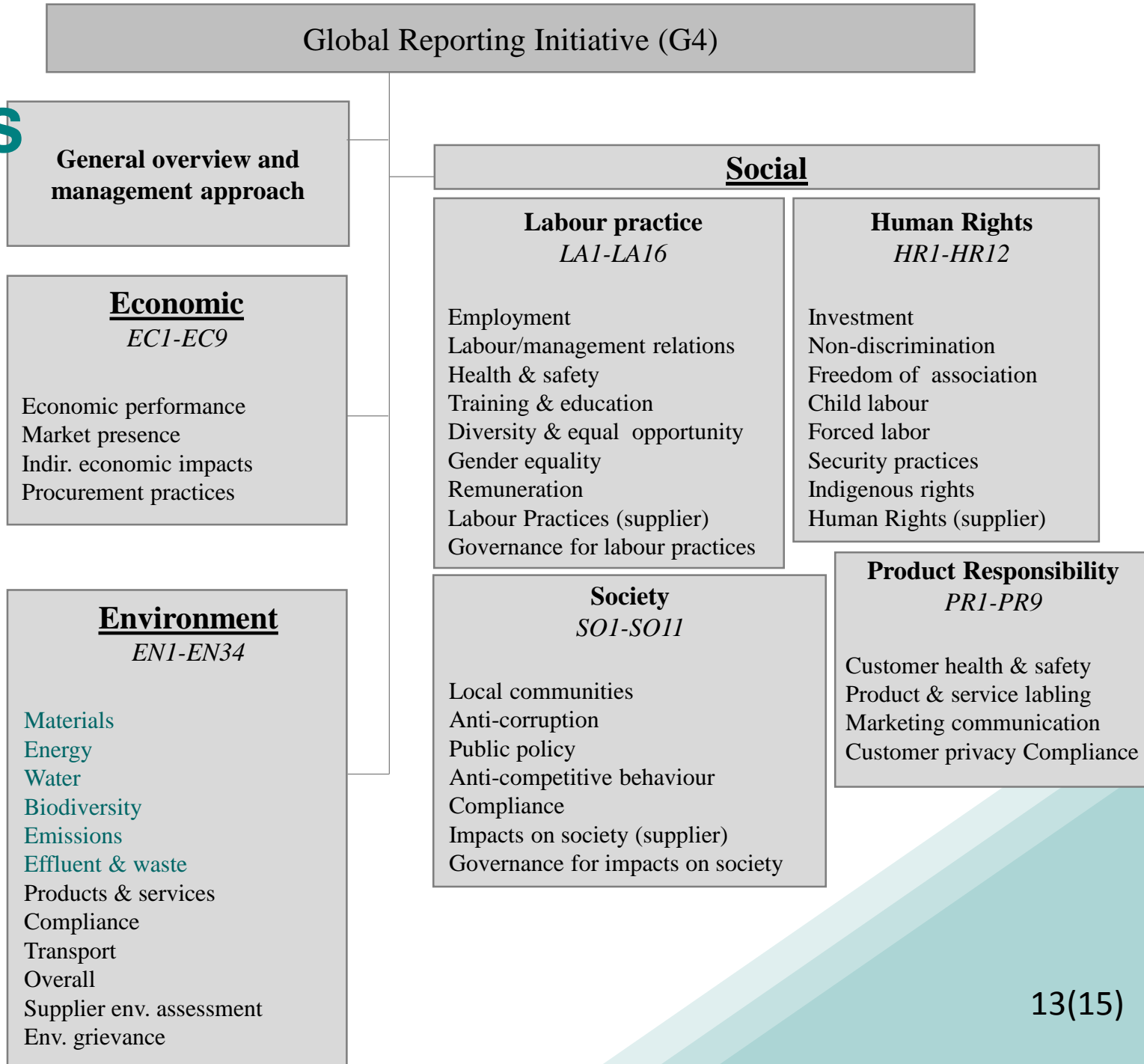
2. Considerations for businesses

Relevant/systemic ecological or social indicators are largely lacking.

Existing indicators focus on impacts.

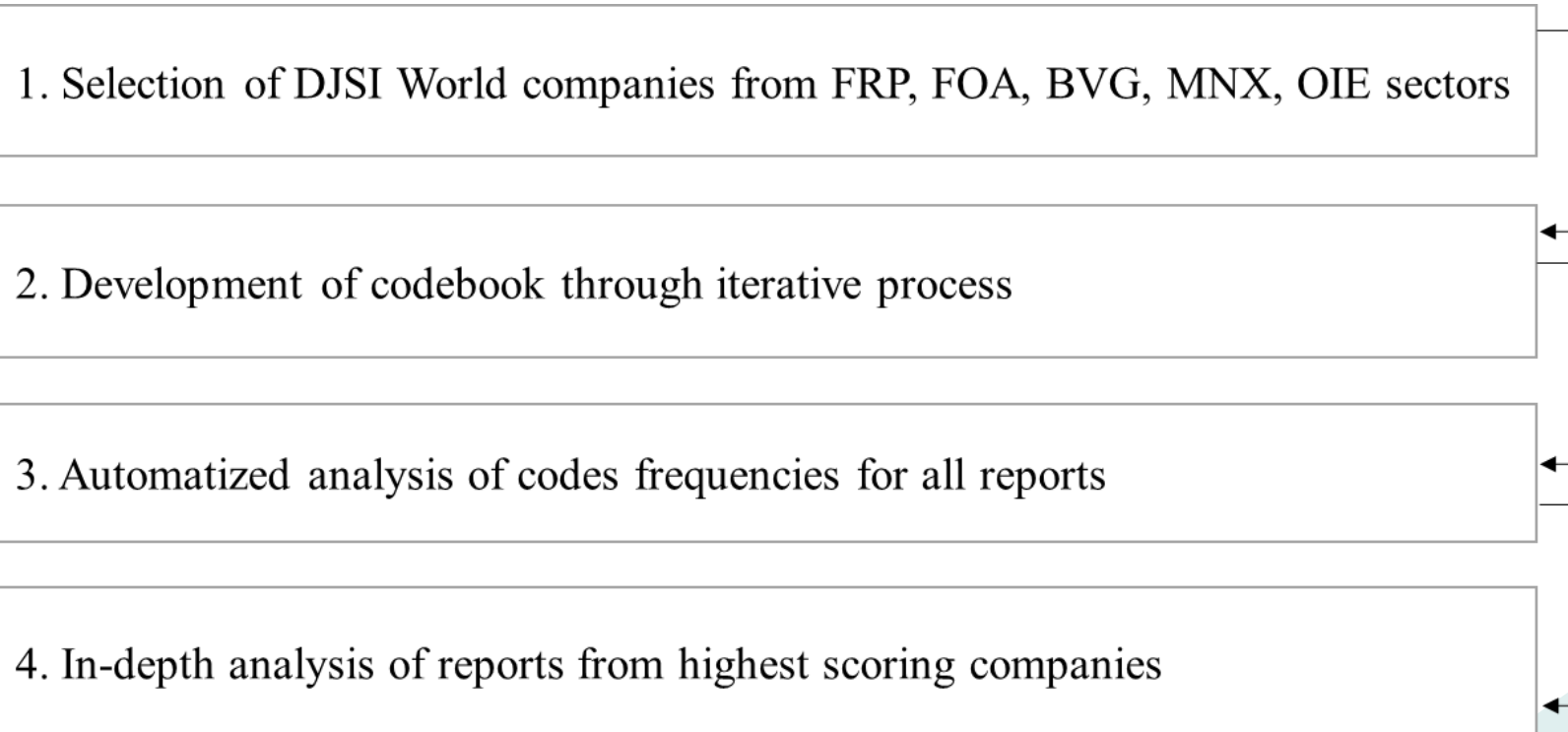
Strategic perspective is missing (i.e. dependencies and response strategies).

D'Amato et al. 2015



2. Considerations for businesses

D'Amato D., Toppinen A., Korhonen J. **Circular, Green, Bio economy: which sustainability concept(s) company align with to define and operationalize sustainability?** Manuscript.



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