

## Background

The traditional linear production and consumption process (take-make-dispose) involves excessive extraction of natural resources and accumulation of contaminating waste products (Sørensen, 2018). By contrast, a circular economy (CE), as a new and inclusive economic paradigm, aims at extending the useful life of materials and promotes recycling to maximize material service per resource input while lowering environmental impacts and resource use (Tisserant et al., 2017). The main point of the CE concept is to capitalize on material flow recycling and to balance economic wellbeing and development with resource and environmental utilization (Zhu et al., 2010), ultimately the decoupling of economic growth from resources and waste. Such decoupling as part of a systemic integration of intra and intergenerational environmental, economic, and social performance (Geissdoerfer et al., 2017), can be the basis of a truly sustainable circular economy. The transition to such an economy is a complex, cross-cutting challenge requiring policy interventions and coordination across many portfolios and dimensions.

### Linear economy



### Circular economy



Linear VS circular economy.

## Research Gaps

- There is no unified definition of a circular economy, especially for a sustainable circular economy.
- As a result, no methodologies for measuring progress towards the circular economy are widely available.
- Lack of research on progress with decoupling for the transition to a sustainable circular economy.

## Circular Economy

“A circular economy is based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems”

EMF, 2013

Geissdoerfer et al., 2017

“A regenerative system in which resource input and waste, emission, and energy leakage are minimized by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling”

“Circular economy (CE) as a new model of economic development promotes the maximum reuse/recycling of materials, goods and components in order to decrease waste generation to the largest possible extent. It aims to innovate the entire chain of production, consumption, distribution and recovery of materials and energy according to a cradle to cradle vision”

Ghisellini et al., 2018

Kirchherr et al., 2017

“An economic system that replaces the ‘end-of-life’ concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes. It operates at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, thus simultaneously creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations. It is enabled by novel business models and responsible consumers”

Four highly cited definitions of the circular economy.

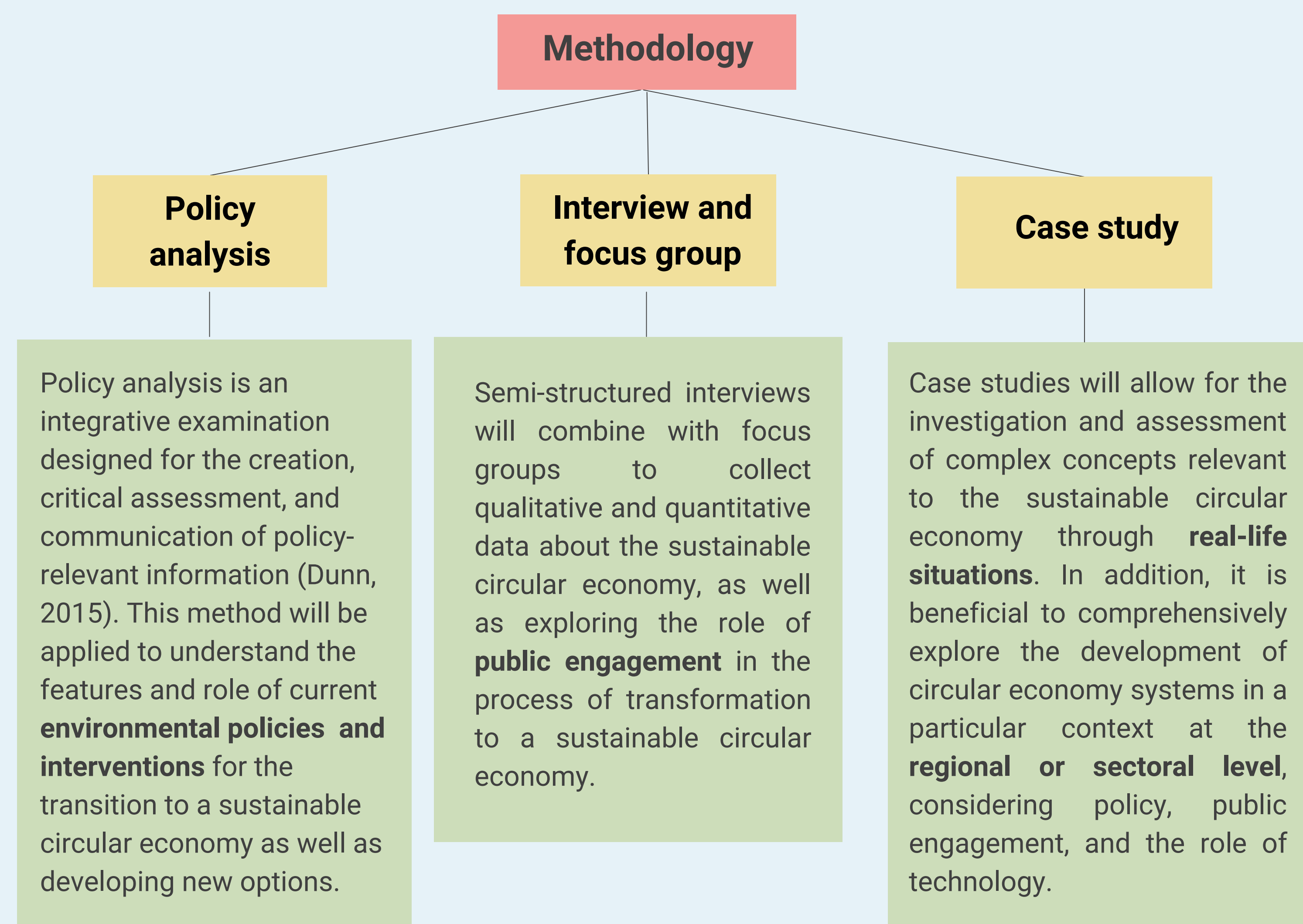
## Research Objectives

- To define the circular economy and the gap between the current state and the expected vision of a Sustainable Circular Economy, to understand the extent of the transformation required.
- To identify the enabling conditions for realizing such a vision and the role of policies and public engagement in accelerating the transformation needed.
- To investigate essential interventions and assess their effectiveness in this process, exploring the role of innovation and technology in the process.

## The current work

- **Systematic review:** seeks to systematically search for, appraise and synthesize research evidence, for a unified definition of a sustainable circular economy.
- **Evaluating the decoupling:** This analysis will select social, economic, and environmental indicators to evaluate decoupling, thereby defining and measuring the gap between the current state and the desired vision of the sustainable circular economy.

## Methodology



## References

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