

# Redesign A Circular Business Model Innovation Ecosystem: A Case Study of The Dutch Microelectronics Ecosystem

## Authors

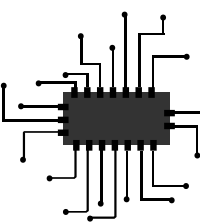
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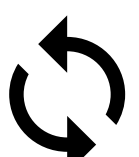
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## Introduction



Global **E-waste** keeps on increasing. The linear “take-make-dispose” model causes environmental damage by **depleting resources** and **producing E-waste**.



A **closed-loop supply chain** can reduce E-waste, conserve resources, and create economic value from reused materials.



Usable and profitable **circular business models (CBMs)** are key enablers for the circular economy (CE) transformation.



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## Objective



Redesign the **innovation ecosystem** for circularity and redefine the business role in the ecosystem.



Explore existing **circular business model innovation (CBMI)** of the B2B electronics industry.



Identify dominant drivers and barriers for redesigning a circular ecosystem and **develop solutions**.

## Methodology: An embedded case study of the Dutch Microelectronics ecosystem

We conducted an embedded case study with **18 business-to-business (B2B) units** in **Figure 1** in the value chain, including raw material providers, original electronics manufacturers (OEMs), component manufacturers, repair service providers (RSPs), waste collectors and recyclers. This study includes two phases as **Figure 2** shows. We collected **qualitative data** from 23 semi-structured interviews, observations, company visits, documentation and visuals.

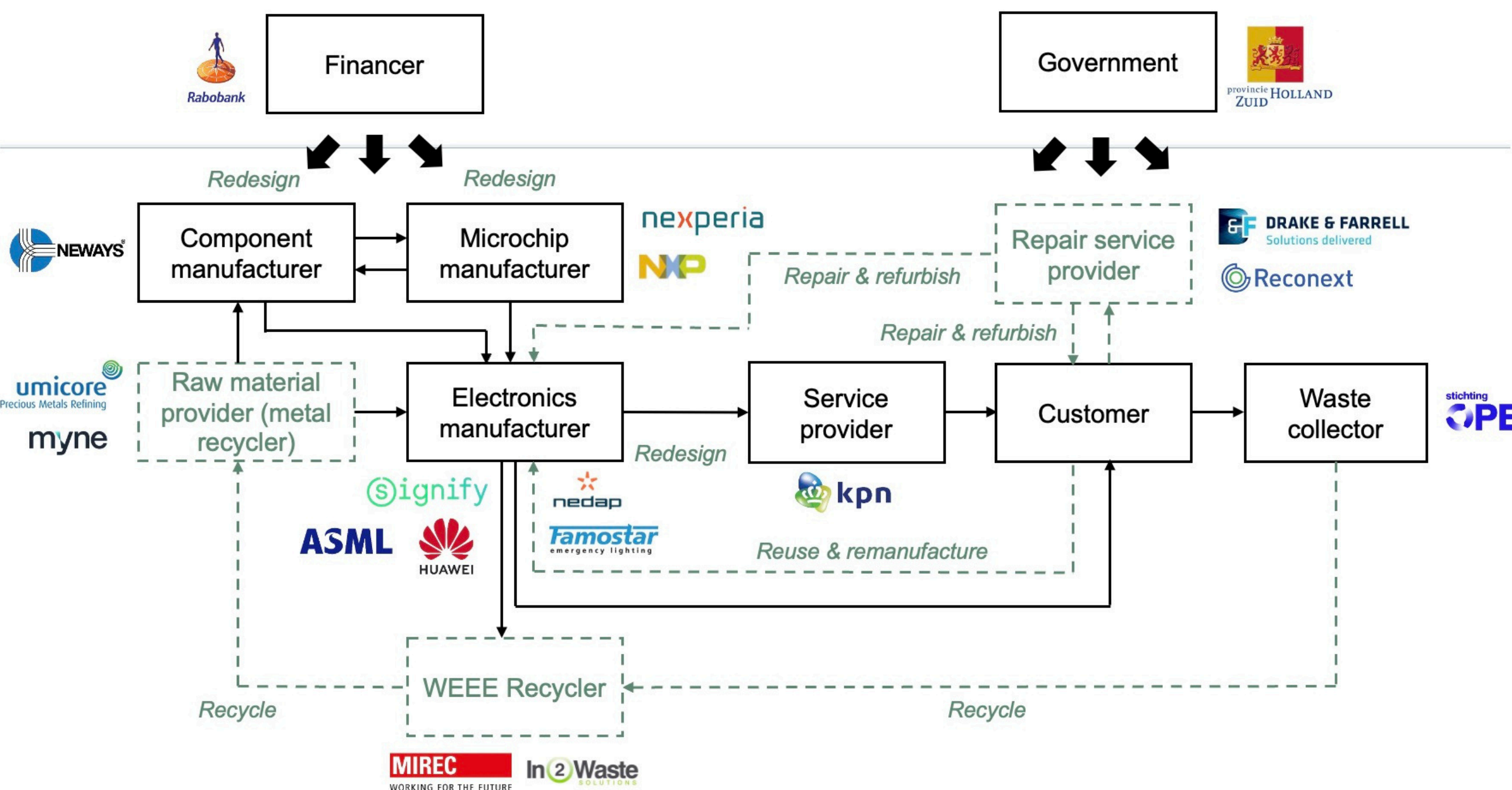


Figure 1: 18 case companies in the microelectronics value chain

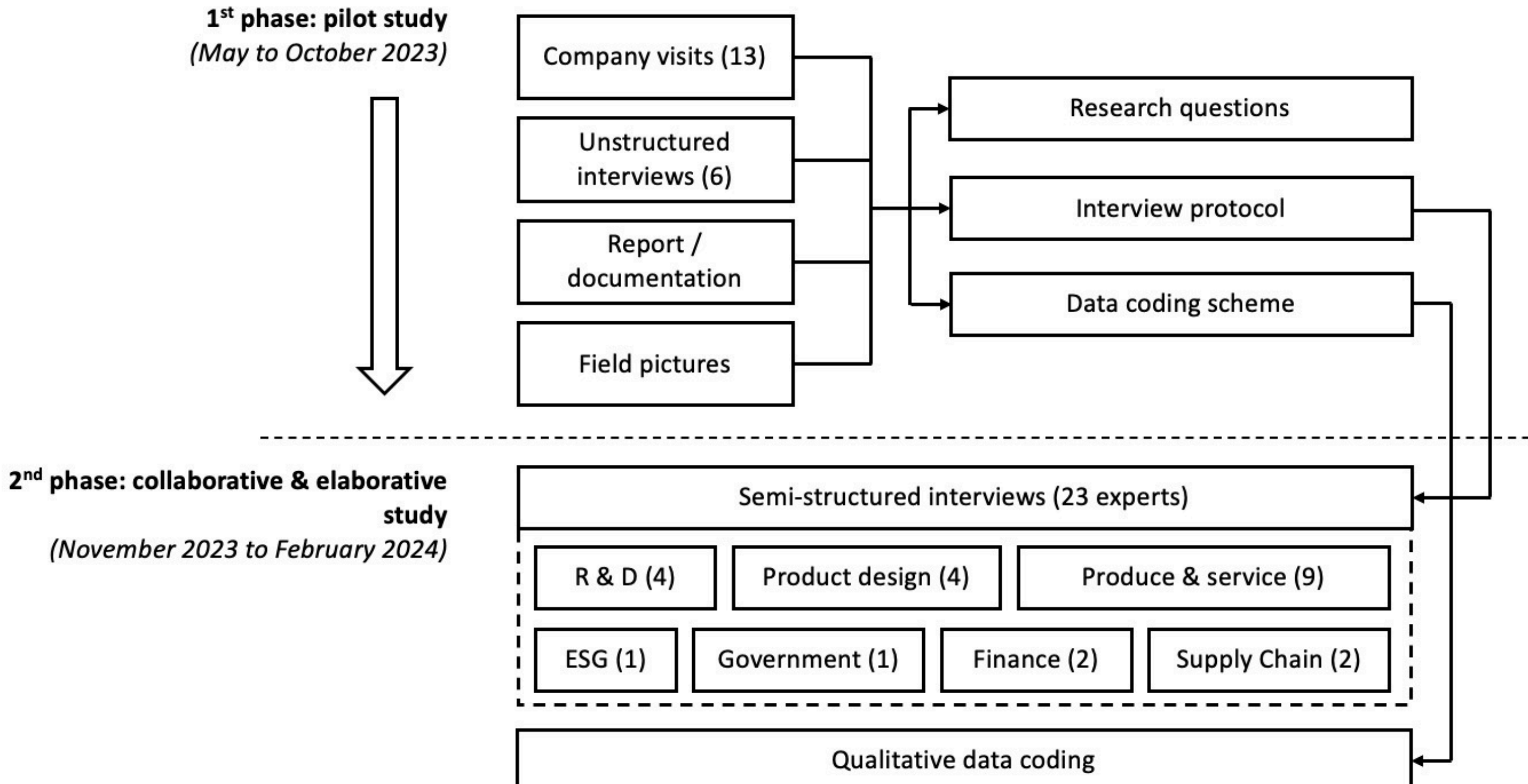


Figure 2: The research process

## Preliminary Results

- More **joint business models** developed by multiple stakeholders: OEMs keep **ownership** of products, RSPs provide repairing and refurbishing **services**, and customers are provided services by OEMs and RSPs.
- Some **competition** was in the market due to **merging business models**: such as recyclers providing repairing services to OEMs, instead of RSPs.
- Legislation requirements, sustainable market demand and technology development are dominant drivers, but cost challenges, regulation constraints, and complex supply chain networks are dominant barriers to circularity. The **regulatory environment** is important for CE implementation.

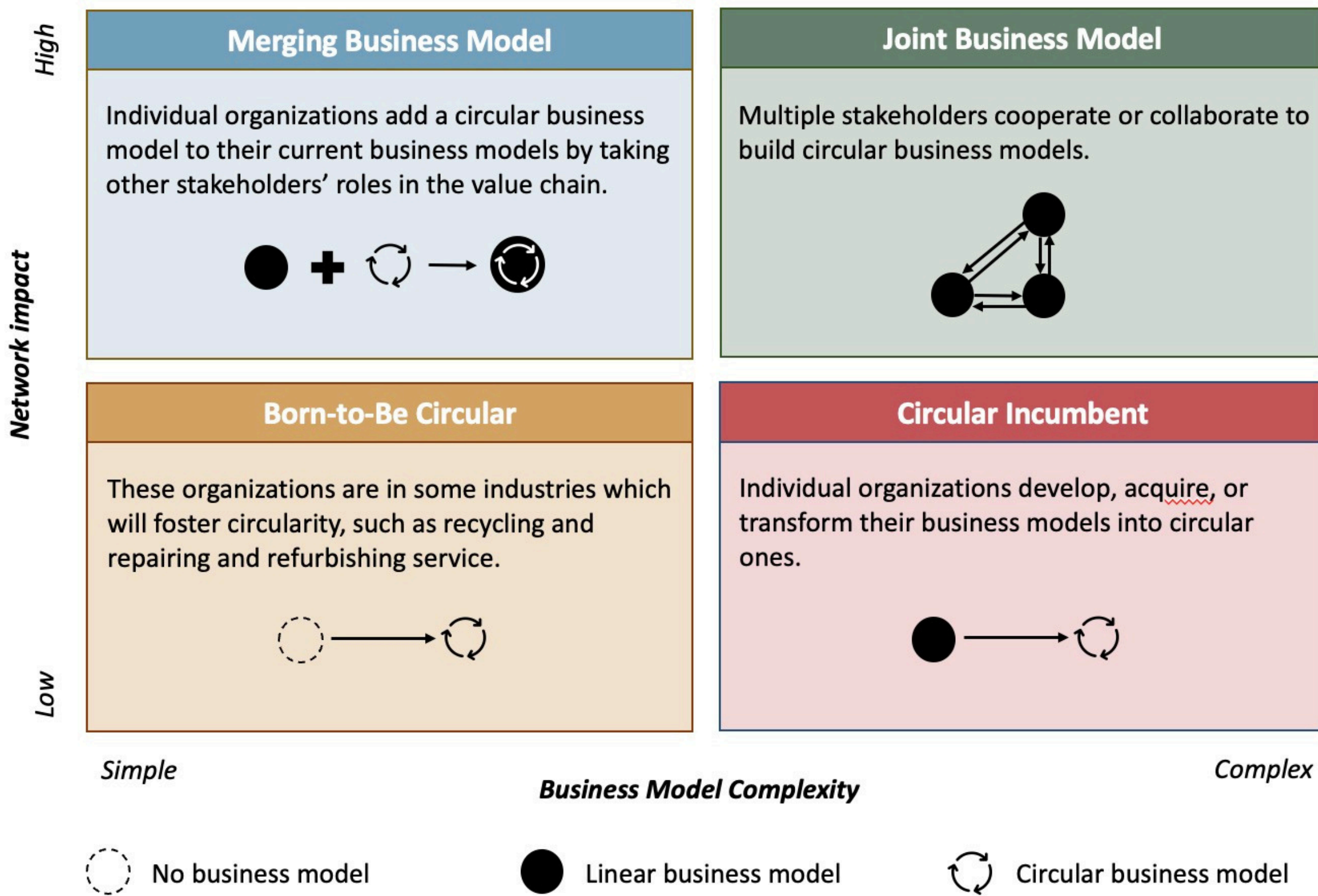


Figure 3: Circular business model innovation matrix in the ecosystem

## Contribution & Future Research

- Theoretical contribution:** we developed the CBMI typology with an ecosystem perspective, filling the gap in both fields.
- Practical contribution:** the industry can get an overview of CBMI, drivers and barriers to achieve circularity and incorporate company strategies.
- Future research:** we will work on how to redesign the new ecosystem for circularity and develop new CBMs. The current idea is to explore non-ownership models, which can activate more activities before the last recycling stage, such as reusing, refurbishing and remanufacturing.

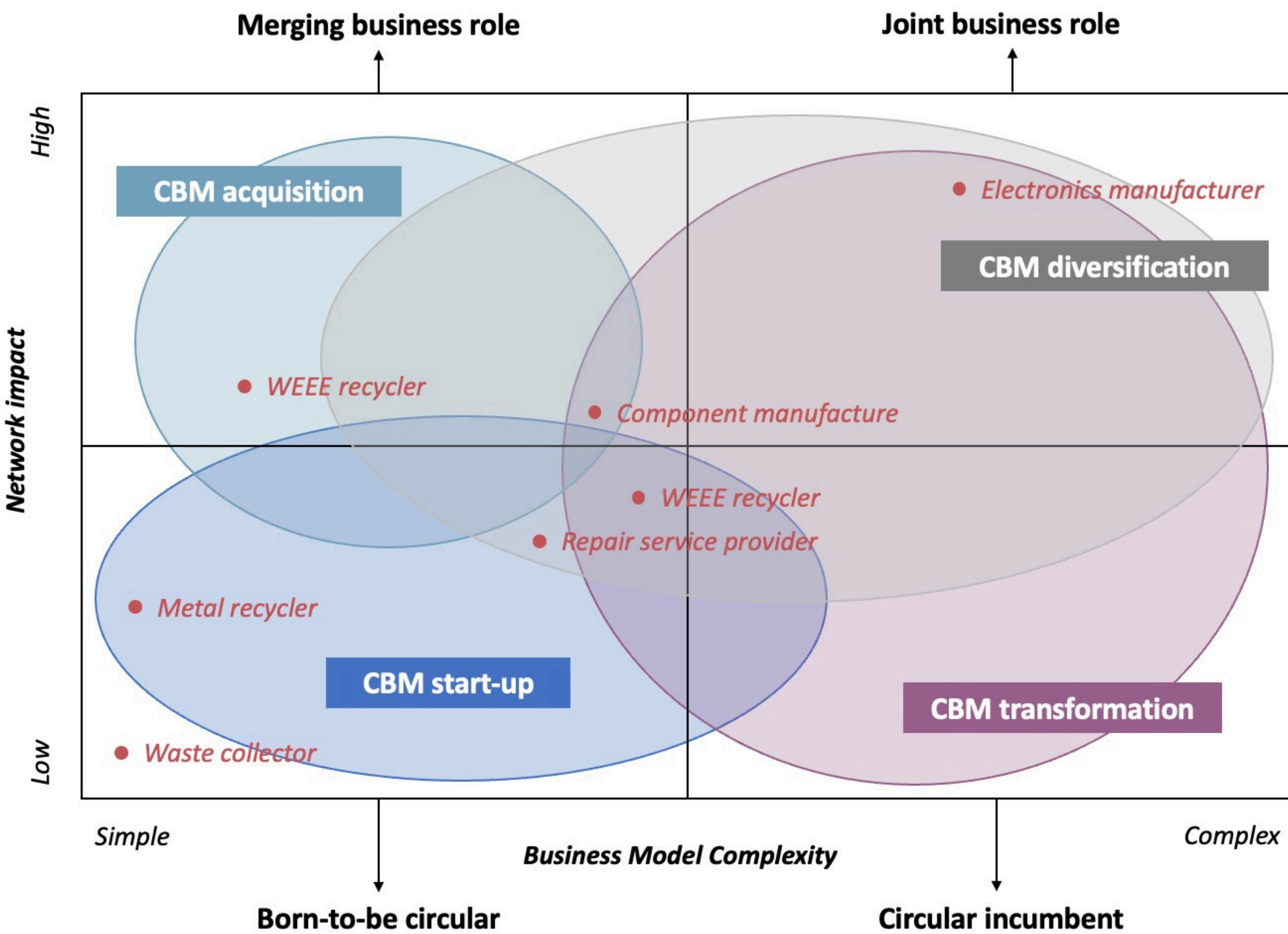


Figure 4: Value chain mapping in circular business model innovation matrix