Department of Business Administration

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Bachelor Thesis in Entrepreneurship and Innovation

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Implementing Circular Business Model Innovation in Large Organizations: Drivers and Barriers

A Study of The Electric Vehicle Battery Value Chain

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Sammanfattning

Examensarbetets titel: Implementing Circular Business Model Innovation in Large Organizations: Drivers and Barriers

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Fem nyckelord: Cirkulära affärsmodellsinnovation, cirkulär ekonomi, affärsmodell, drivkrafter och barriärer, hållbarhet

Forskningsfråga: Vilka drivkrafter och barriärer upplever stora företag när de implementerar cirkulära affärsmodellsinnovation?

Syfte: Att utforska och analysera de drivkrafter och hinder som stora organisationer upplever vid implementering av cirkulär affärsmodellsinnovation inom elbatteri industrin.

Metod: Studien använder sig av en kvalitativ multi-case-studie med semistrukturerade intervjuer. En tematisk analys har använts för att identifiera konsekventa mönster i datamaterialet.

Teoretiska perspektiv: Studien består av teorier inom CBMI, drivkrafter och barriärer samt hur det påverkar företags värde till kunden.

Resultat: Lagändringar samt ekonomiska faktorer utgör de tydligaste barriärer och drivkrafter

Slutsats: Övriga drivkrafter och barriärer uppstår till följd av lagändringar och ekonomiska faktorer och om företag ska kunna utveckla sin CBMI krävs stora interna strukturella förändringar och en ökad samarbetsvilja internt och externt.

Abstract

Title: Implementing Circular Business Model Innovation in Large Organizations. Drivers and Barriers

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Key words: Circular business model innovation, circular economy, business model, drivers & barriers, sustainability

Research question: What drivers and barriers do large organizations experience when implementing circular business model innovation?

Purpose: Is to explore and analyze the drivers and barriers that large organizations experience when implementing circular business model innovation within the EV-battery industry.

Methodology: This study uses a qualitative multi-case-study with semi-structured interviews. A thematic analysis was used to identify consistent themes in the data material.

Theoretical perspectives: The study consists of theories within CBMI, drivers and barriers and how they affect organizations' value to customers.

Result: Regulatory changes and financial factors are the most prominent drivers and barriers.

Conclusions: Other drivers and barriers appear because of regulatory and financial factors, and if organizations are to develop their CBMI, major internal structural changes are needed as well as increased willingness to cooperate internally and externally.

1. Introduction

This chapter introduces the background and relevance of circular business model innovation, highlighting the growing pressure on large organizations to transition towards more sustainable and circular practices. It presents the problematization by outlining the challenges large firms face when implementing circular business models, followed by the purpose and research question of this study.

1.1 Background

In 2015, the United Nations adopted Agenda 2030 and the Sustainable Development Goals (SDGs), establishing a global framework for achieving economic, social and environmental sustainability (Regeringskansliet, 2020). Since then, the urgency of transforming production and consumption systems has intensified as climate change, biodiversity loss, and resource depletion continue to challenge existing economic models (Bocken et al., 2016). Organizations across industries, regardless of size or sector, are therefore under increasing pressure to innovate in ways that reduce environmental impact while maintaining competitiveness and long-term profitability (Lewis Liu, 2023).

A central response to these challenges is the concept of the circular economy (CE) (Bocken et al., 2016). The circular economy seeks to decouple economic growth from the extraction of finite resources by keeping materials and products in use for as long as possible through strategies such as reuse, repair and remanufacturing (Bocken et al., 2016). Rather than treating waste as an inevitable outcome of production, CE reframes waste as a potential resource and emphasizes the retention of value throughout product life cycles (Ellen MacArthur Foundation, 2025). However, achieving such systemic change requires more than technological improvements, it requires organizations to fundamentally rethink how they create, deliver and capture value. This is where circular business model innovation (CBMI) becomes critical. CBMI refers to the redesign of business models so that they enable circular flows of resources while still generating economic value (Bocken et al., 2016). Instead of focusing on volume based sales, firms may adopt service based models, product-service systems, or value retention strategies that extend product lifetimes and increase utilization (Bocken et al., 2016) Such changes represent a departure from traditional linear business

logic and often require significant organizational, technological and strategic adaptation (Bocken et al., 2016).

While circularity is often discussed at a systemic level, the challenge becomes particularly visible in products that retain significant functional value even after their initial use phase. Moore et al. (2020) show that many complex products are discarded or recycled prematurely despite still having substantial remaining technical and economic potential, leading to unnecessary environmental burdens and lost economic value. Extending product lifetimes through reuse, refurbishment, and second-life applications has therefore become a central principle of the circular economy. Reza Toorajipour et al. (2023) argue that such value-retention strategies are crucial for improving both resource efficiency and economic viability in material-intensive industries.

At the same time, regulatory and institutional frameworks are increasingly aligned with sustainability and circularity objectives (Kirchherr et al., 2018). Governments and supranational bodies have introduced new environmental regulations aimed at improving traceability, producer responsibility, and end-of-life management (European Commission, 2025). While these policies are designed to accelerate sustainability transitions (UNEP, 2025), they also impose new costs, risks, and uncertainties on firms (Testa et al., 2018) . As a result, the implementation of CBMI takes place in a context characterized by both strong external pressure and significant strategic and financial uncertainty (Bocken et al., 2016). According to Geissdoerfer et al. (2022), this leads to a complex configuration of drivers and barriers that shape whether and how organizations engage in circular business model innovation. Understanding these forces is crucial for enabling the transition from linear to circular systems.

1.2 Problematization

Although the importance of the circular economy and circular business model innovation is widely acknowledged, research in this area remains fragmented and incomplete (Munonye, C. W., 2025). While many studies emphasize the environmental necessity of circularity, fewer provide detailed insight into how organizations implement CBMI in practice, particularly within large and complex firms.

Geissdoerfer et al. (2022) addresses part of this gap by identifying a set of key drivers and barriers that influence CBMI, including financial, organizational, technological, market, regulatory and value-chain-related factors. They also stress the importance of cross-sectoral collaboration for overcoming these challenges. However, their framework remains largely generic and does not sufficiently explain how these drivers and barriers interact in real organizational settings, especially in contexts characterized by rapid regulatory change and high investment risk.

Nonetheless, Santa-Maria et al. (2021) argue that managerial decision-making and organizational willingness to engage in sustainability-driven innovation remain under-researched. While firms may face strong external pressure to become more sustainable, it is ultimately management's strategic interpretation of these pressures that determines whether sustainability leads to meaningful business model innovation or merely to superficial compliance. This highlights the need to study CBMI not only as a technical or regulatory issue, but as a strategic and organizational process.

Biloslavo et al. (2025) show that firms are more successful in business model innovation when sustainability objectives are embedded in corporate strategy and when institutional pressures are interpreted as opportunities rather than constraints. These insights are highly relevant, as CBMI similarly requires firms to align sustainability goals with strategic and organizational change. However, while their findings point to the importance of strategic integration and institutional context, it remains underexplored how such sustainability-oriented strategies are translated into concrete circular business model configurations, particularly in large incumbent firms.

In addition, upcoming regulatory changes aimed at strengthening sustainability and circularity introduce new uncertainty regarding future cost structures, responsibilities, and competitive dynamics. Whether such regulation acts primarily as a driver or a barrier to CBMI remains ambiguous. Together, these gaps point to a lack of empirical understanding of how large organizations navigate the complex interaction between regulation, financial risk, organizational capabilities and strategic priorities when implementing CBMI.

1.3 Purpose & Research Question

The purpose of this study is to explore and analyze the drivers and barriers that large organizations experience when implementing circular business model innovation within the EV-battery industry. The study analyzes what changes, where changes occur, and why changes succeed or fail as well as which contextual factors enable or hinder that transformation. The research question of this study is therefore:

What drivers and barriers do large organizations experience when implementing circular business model innovation?

By answering this question, the study aims to contribute to a deeper understanding of how large firms navigate the transition from linear to circular business models in a rapidly changing institutional and economic environment.

2. Theory

This chapter outlines key concepts that form the basis for the development of the theoretical framework used in this study as well as the central theoretical concept of this study revolving around circular business model innovation. The concepts of sustainability and sustainable business models are also discussed to distinguish CBMI from broader sustainability-oriented approaches and to situate the study within the wider CBMI literature. By integrating perspectives on circular practices, business model structure, as well as drivers and barriers to CBMI, this chapter provides the analytical basis for examining how large organizations implement CBMI.

2.1 Circular Economy

As Izquierdo-Monfort & Rongé (2025) emphasizes, the circular economy (CE) continues becoming more relevant in response to the growing need for sustainable production and consumption that operate within planetary boundaries. A commonly cited framework within CE literature is the set of circular strategies known as the 9 Rs: Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Remanufacture, Repurpose, Recycle and Recover. The goal of these strategies is to minimize the use of resources, reduce waste and extend the life of products and materials.

These circular strategies are embedded in Bocken et al.'s (2016) three principles of circular systems, known as narrowing, slowing and closing resource loops. Closed-loop systems focus on recirculating materials through processes such as recycling, thereby maintaining post-use materials over a greater period of time inside the production cycle. Narrowing resource loops instead aims to reduce the amount of resources used per product by improving production efficiency. Additionally, slowing resource loops seeks to extend product lifetimes through reuse, repair or refurbishment. Together, these circular systems reduce overall resource consumption and environmental impact.

Furthermore, Urain et al. (2024) emphasizes the concept of indicators as a crucial role in enabling firms to assess and guide their CE strategies. Such indicators function as measurement tools which supports managers' decision making by facilitating goals as well as monitoring their performance and evaluating progress. Indicators related to material use, resource efficiency and lifetime of products offer insights into organizational performance across different stages of the value chain. However, in order to accurately identify such indicators, further research and development into CE platforms are required as organizations struggle to scale, adopt circularity, and improve their financial performance (Blackburn et al., 2025).

2.2 Sustainability

Sustainability is a fundamental concept within both circular economy and business model innovation. Despite its widespread use, the term lacks a universally accepted definition and is interpreted differently across academic disciplines. To address this conceptual ambiguity, Moore et al. (2017) conducted a comprehensive synthesis of sustainability definitions across the scientific literature. This synthesis describes sustainability as the continued delivery of a program, intervention or practice over time, including the maintenance of individual or organizational behavior change, while allowing for adaptation and continued benefit generation.

This study adopts a functional understanding of the concept of sustainability which is inspired by Scheirer (2005) and later operationalized by Moore et al. (2017). From this perspective, sustainability refers to the ability of a system or initiative to maintain its core

functions and desired outcomes over time, even as contextual conditions evolve. Important to note is that the concept of sustainability may change over time, it has to allow for modifications to be made as long as the purpose of preserving intended benefits remain.

Furthermore, within the context of the circular economy, sustainability provides the values and norms for reducing the environmental impact, improving resource efficiency and ensuring long term viability of economic and industrial systems. As such, sustainability serves as an overarching principle that motivates the transition from linear to circular systems and underpins the development of circular strategies and innovations discussed in subsequent sections (Ellen MacArthur Foundation, 2025).

2.3 Business Model

The concept of a business model refers to the fundamental logic through which an organization creates, delivers and captures value. A business model must clearly identify the target customer, articulate the value proposition and explain how the firm generates revenue while managing costs. At its core, a business model answers the essential managerial question: how does the firm make money while delivering value to customers at an appropriate cost? (Magretta, 2002).

Richardson (2008) proposes a simplified and strategic framework for understanding how a firm does business and how their strategy is executed to gain competitive advantage. The business model framework places value at the center of analysis with three main components in focus. The first component is value proposition, which includes the offering, the target customers and the firm´s reasoning for how it will compete. A strong value proposition must offer customers greater value than competitors, meaning that the strength of the businesses value proposition is determined by its strategic positioning on the market. The second component is value creation, which explains how the firm will deliver its value proposition by first detailing the organization, including resources, activities, value chain, and secondly the value network, including suppliers, partners and distributors. Activities and processes within the firm should align with delivering the promised value as well as support strategic differentiation or cost advantage. The last component is value capture, which emphasizes revenue sources and introduces the economic model, explaining the logic behind costs, margins profitability and timing of cash flows. According to Richardson (2008), the

economic model is essential to sustaining competitive advantage, since value capture not only is about revenue but also concerns cost structure and how the firm retains part of the value it creates.

2.4 Sustainable Business Model

The concept of a sustainable business model (SBM) extends the traditional business model framework by explicitly integrating sustainability considerations into how value is created, delivered and captured. While conventional business models primarily emphasize economic value creation for the firm, SBMs adopt a broader perspective that incorporates environmental and social dimensions alongside economic performance (Norris, 2024).

Sustainable business models focus on value proposition, value creation and delivery, and value capture for a wider range of stakeholders, rather than solely prioritizing financial outcomes (Norris, 2024). In this sense, SBMs seek to balance profitability with long term environmental stewardship and social responsibility. Atkova et al. (2025) highlights that business model innovation is a continuous process that requires persistent top managerial attention, emphasizing their ability to notice emerging opportunities, analyze them and finally take action.

Given that the primary focus of this study is on circular business models and circular business model innovation, sustainable business models are introduced here as a related but broader concept. This distinction helps clarify the analytical scope of the study and positions CBMI as a specific pathway through which sustainability objectives can be operationalized within the circular economy framework.

2.5 Circular Business Model Innovation

Circular business model innovation (CBMI) is the process through which firms either design, adapt or transform their business models in order to create economic value while maintaining resources in use for as long as possible (Bocken et al., 2016). This is done by deviating from the traditional linear “take-make-dispose” model and instead developing circular principles such as closed-loop or slow-loop systems (Izquierdo-Monfort & Rongé, 2025). The goal of CBMI is to reduce waste, enhance resource efficiency and enable practices such as the 9 Rs.

Thereby lowering the environmental impact while simultaneously creating competitive advantages and long term viability.

Izquierdo-Monfort & Rongé (2025) also argue that the focus of circular business models is slowing and closing resource loops. Slowing loops extends product lifetimes, while closing loops instead reintegrates materials into production through recycling. This study specifically focuses on closed-loop systems, which Bocken et al. (2016) define as systems in which "*the loop between post-use and production is closed, resulting in a circular flow of resources.*"

These loops envision structural and operational changes within organizations and are considered crucial for CBMI and have gained greater attention for years. Furthermore, Angelshaug et al. (2025) builds upon the findings shown by Atkova et al. (2025), stating that the fundamentals for innovating business models derive from the structure of top management teams. However, emphasizing its importance of a centralized structure to enhance sensemaking of market opportunities, as well as greater external knowledge and an internally stronger ambition for business model innovation.

In order to understand CBMI, it is important to define innovation. Rogers (1982, p.xviii), defines innovation "*as an idea, practice, or object that is perceived as new by an individual or another unit of adoption*". Innovation is not to be defined as simply new products or services, it extends beyond this, including innovative processes, marketing and organizational methods. However, in a business context, novelty alone is insufficient, since innovation must also generate practical value (Smith. J.D, 2024, pp. 5). Within this study, initiatives aimed at developing more sustainable solutions for EV-batteries are therefore considered innovations, if they contribute to improved sustainability outcomes while supporting business objectives.

Geissdoerfer et al. (2022) highlight that business model innovation is influenced by a variety of enabling and constraining factors which vary depending on the type of CBMI pursued. Urain et al. (2024) categorize these factors into three main dimensions: strategic, operational, temporal. The strategic factor concerns the choice between regenerative strategies and different circular loops. The operational factor relates to the implementation of the 9 R strategies. However, Urain et al. (2024) note that firms often disproportionately emphasize recycling, resulting in a focus on end-of-life management rather than holistic circular design.

The temporal factor addresses how circular initiatives evolve over time, though this dimension remains less explored in practice.

2.6 Drivers and Barriers

As stated by Geissdoerfer et al. (2022) there are many different motivating factors that either hinders or pushes organizations in the implementation of circular business models. His study provides answers to this question by categorizing the main drivers and barriers that firms experience when transforming their CBM. Many of the presented drivers and barriers are similar, but act as either one or the other depending on the organization and industry. Though, the main drivers and barriers in general are financial, market, organizational, technical, value chain and legal.

Regulations as a driver and barrier have recently gained increased recognition and are considered some of the most significant for integrating CE and the further development of business models. As a driver, they provide clear guidance by demanding resource efficiency and decreased waste, creating incentives for CBMI. However, as a barrier, regulations may hinder organizations ability to scale as they struggle to efficiently adapt to strict frameworks (Munonye, C. W., 2025).

2.6.1 Drivers

As Geissdoerfer et al. (2022) states, financial drivers exist when organizations realize the potential for their business to grow, ways to lower their costs or by opportunities that allow the firm to create resilience. The market acts as a driver when the customer demands are changing, allowing for new products or services to enter the market, creating a new niche. Organizational drivers exist when firms realize the potential by implementing for example ESG factors to further strengthen their core. Technical drivers exist when either new technology is invented or when the opportunity for new technology arises. Lastly, legal drivers are when current regulations by the government or firms are changed, which can open up for new opportunities as well as new businesses or markets.

2.6.2 Barriers

When financial circumstances act as a barrier, it is most common due to high investment costs and financial uncertainty which stagnates business and market developments. Organizational barriers are most common due to lack of leadership, resilience to change and limited knowledge of circular economy, and value chain barriers appear as a result of poor logistics and coordination issues, either internally or externally (Geissdoerfer et al., 2022). These are the most barriers which usually become apparent due to changes within an organization or a market, which affects the labour of the entire value chain.

2.7 Theoretical Framework

The theoretical framework of this study is developed to analyze drivers and barriers in the implementation of circular business model innovation (CBMI) in large organizations. Rather than applying existing frameworks separately, this study integrates three complementary perspectives into a unified analytical framework.

First, Izquierdo-Montfort & De Rongé (2025) conceptualize CBMI as a set of organizational practices and patterns aimed at retaining resource value over time. This perspective explains how circularity is operationalized through activities such as reuse, remanufacturing, refurbishment, and product-as-a-service models. Second, Richardson's (2008) business model framework provides a structural lens for understanding where CBMI implementation occurs within the firm. By distinguishing between value proposition, value creation and delivery, and value capture, the framework enables analysis of how circular initiatives reshape core business model components. Third, Geissdoerfer et al. (2022) identify the organizational, technological, market, and regulatory drivers and barriers that influence CBMI implementation. This perspective explains why circular initiatives are enabled or constrained.

2.7.1 Circular Business Model Innovation: Uncovering Practices and Patterns to Retain the Value of Resources

Izquierdo-Montfort & De Rongé (2025) conceptualize CBMI as a process through which organizations redesign their business models to retain the value of resources for as long as possible. Rather than focusing solely on recycling or waste reduction, CBMI emphasizes value retention strategies such as reuse, repair, refurbishment, remanufacturing, and sharing.

These strategies challenge the traditional linear “take-make-dispose” model and requires firms to reconsider how products, services, and materials circulate within and across the organizational boundaries.

The authors highlight that CBMI is not a single change but a combination of interconnected practices and patterns that together enable circularity. Practices refers to concrete organizational activities, such as implementing take-back systems, offering product-as-a-service (PaaS) solutions, or designing products for durability and modularity. Patterns on the other hand, describes the recurring configurations of these practices which can be observed across organizations and industries. By identifying patterns, the framework allows researchers to understand CBMI as a systematic transformation of business models.

Another central contribution of this perspective is that resource value retention is one of the guiding principles of CBMI. Value is not only created at the point of sale but continuously throughout the lifecycle of products and materials. This implies that organizations must develop capabilities in areas such as reverse logistics, long-term customer relationships, and cross-sector collaboration. For large organizations, these requirements often imply significant organizational complexity, coordination challenges, and changes to established routines.

From a drivers and barriers perspective, this framework suggests that CBMI is shaped by both internal and external conditions. On the one hand, access to resources, technological capabilities and strategic commitment can drive the adoption of circular practices. On the other hand, organizational inertia, misaligned incentives and the difficulty of coordinating across large organizational structures can act as barriers. The framework provided by Izquierdo-Montfort & De Rongé (2025) therefore provides an understanding of what CBMI looks like in practice and why its implementation may be particularly challenging for large organizations.

2.7.2 The Business Model: An Integrative Framework for Strategy Execution

Richardson (2008) defines the business model as an integrative framework that translates strategy into operational reality. According to this perspective, a business model consists of three core elements: value proposition, value creation and delivery system, and value capture.

Together, these elements explain how an organization creates value for customers, how they deliver that value through organizational processes, and how they ensure economic returns.

This framework is particularly useful for analyzing CBMI as circular initiatives often require changes across all three components of the business model. For example, the value proposition may shift from selling products to instead offer services. The value creation and delivery system may need to incorporate new partners, reverse flows of materials, and redesigned processes for production. Similarly, value capture mechanisms may change as revenue models shift from one-time sales to recurring payments or outcome-based pricing. For large organizations, Richardson's framework helps to identify which parts of the business model are most affected by circular innovation and where organizations may face resistance or support. Large firms often have deeply embedded business models optimized for efficiency and scale within a linear economy.

By using Richardson's framework as an analytical tool, this study can systematically map how CBMI initiatives influence different components of the business model and assess where drivers and barriers are most prominent. For instance, top management support may act as a driver for redefining the value proposition, while legacy IT systems or rigid supply chains may act as barriers within the value creation and delivery system. Thus, Richardson's model provides a structural lens that complements the more process-oriented view of CBMI offered by Izquierdo-Montfort & De Rongé.

2.7.3 Drivers and Barriers for Circular Business Model Innovation

Geissdoerfer et al. (2022) provide a comprehensive framework for understanding the drivers and barriers that influence CBMI. They define drivers as factors that enable, motivate, or accelerate the implementation of circular business models, while barriers are factors that hinder, slow down, or prevent such implementation.

The framework categorizes drivers and barriers into several dimensions, including organizational, market, technological, regulatory, and cultural factors. Organizational drivers include leadership commitment, strategic alignment, and employee capabilities, while organizational barriers often relate to resistance to change, lack of internal coordination, and competing strategic priorities. Market drivers include changing customer preferences or

demands, as well as competitive pressure. Market barriers, however, involve uncertain demands for circular offerings or, customer deeming products or services as too expensive. Technology may also act as a driver or barrier, as technological innovation can enable circular solutions, they can also act as barriers when the required technologies either do not exist or are costly. Regulatory drivers, such as environmental policies and extended producer responsibility, can encourage the implementation of CBMI, while regulatory uncertainty or misalignment across regions can hinder the implementation. This is an issue that is particularly relevant for large organizations operating across multiple markets.

The framework Geissdoerfer et al. (2022) presents is valuable for this study as it connects drivers and barriers to different aspects of CBMI. It acknowledges that large organizations face unique challenges due to their size, complexity, and established business models. Simultaneously, large firms may benefit from stronger market influence and the ability to engage in systemic change, which can act as powerful drivers of CBMI.

By synthesizing these perspectives, this study develops an analytical framework in which CBMI practices illustrate what changes are implemented, business model components show where they occur, and drivers and barriers explain why they succeed or fail. These dimensions combined provide a structured lens for examining how circular practices are introduced and how specific drivers and barriers shape different aspects of CBMI implementation across large organizations.

3. Method

This chapter outlines the methodological approach employed in the study. The research design combines primary and secondary data in order to gain an in-depth understanding of circular business model innovation within the context of EV-batteries. Primary data consist of semi-structured interviews with key individuals from organizations within the EV-battery industry which focus on CBMI. Secondary data comprise scientific literature on CBMI, with particular emphasis on drivers, barriers identified in previous research.

3.1 Research Design

According to Bryman & Bell (2019), a research design provides the framework for collecting and analyzing data in a manner that enables researchers to address the research questions and generate empirical evidence. The EV-battery industry was selected as the empirical context due to its central role in the transition toward a circular economy and climate-neutral mobility. EV-batteries involve resource-intensive production, complex global value chains, and significant end-of-life challenges (Niri et al., 2023; Beaudet et al., 2020), which make CBMI particularly relevant. In addition, the industry is currently shaped by rapidly evolving regulation, technological development, and increasing societal and market demands for sustainability (European Commission, 2025; Sang et al., 2024). These characteristics make the EV-battery sector especially suitable for studying organizational drivers and barriers to CBMI implementation in large firms.

This study aims to explore how organizations within the EV-battery industry respond to increasing regulatory pressure and societal sustainability demands. As the primary unit of analysis is the EV-battery industry, each organization is treated as a case within a shared context of the industry, allowing this study to be a multiple case study with a cross comparison hematic analysis. This design enables the exploration of CBMI across several organizational contexts rather than within a single firm (Bryman & Bell, 2019; Braun & Clarke, 2006). By examining multiple large organizations operating at different stages of the EV-battery value chain, this study can identify shared patterns as well as industry-specific differences in drivers and barriers to CBMI implementation.

A qualitative approach was chosen as the study seeks to understand organizational experiences, strategic reasoning, and perceived drivers and barriers to CBMI phenomena that are context-dependent and not easily quantifiable. Semi-structured interviews allow for in-depth exploration of organizational processes, interpretations, and decision-making logics (Bryman & Bell, 2019). However, qualitative studies also involve limitations. Findings are context-bound and may not be statistically generalizable beyond the studied organizations. In addition, interview data reflect subjective perceptions, which may be influenced by organizational positioning or individual roles. These limitations were mitigated by sampling multiple organizations and comparing empirical findings with existing literature. Lastly, the researchers acknowledge the risk of mistranslation as the interviews were held in Swedish

and later translated to English. On the other hand, by conducting the interviews in Swedish it allowed for a greater and richer interview, and the risk is deemed low as the progress of transcribing audio recordings was done in collaboration.

3.1.1 Trustworthiness

In qualitative research, trustworthiness is commonly assessed through credibility, dependability, and confirmability (Bryman & Bell, 2019). Credibility was strengthened through the use of semi-structured interviews, which enabled follow-up questions and clarification of responses to ensure accurate understanding of participants' perspectives. In addition, interview transcripts were reviewed in relation to the audio recordings to reduce misinterpretations. Dependability was ensured by maintaining an audit trail documenting the research process. This included records of sampling decisions, interview guides, interview transcripts, coding procedures, and analytical theme development. Such documentation increases transparency and allows the research process to be reviewed. Confirmability was addressed by grounding the analysis in empirical data rather than researcher preconceptions. Coding and theme development were continuously compared with the raw data to ensure that interpretations reflected participants' accounts rather than researcher bias.

3.2 Literature Selection

The literature on CBMI is extensive and spans multiple industries and geographical contexts. To ensure relevance and rigor, a structured literature search was conducted primarily through the Scopus database. Search strings combined key terms such as "circular business model innovation", "circular economy", "EV-batteries", "drivers", and "barriers". Inclusion criteria required articles to be peer-reviewed, published in academic journals, and directly related to CBMI or circular strategies in industrial contexts. Priority was given to highly cited and recent publications to ensure both theoretical grounding and contemporary relevance. Methodological literature, particularly Bryman & Bell (2019), was selected to guide research design, data collection, and analysis procedures. Additional sources, such as Smith (2025), were included to clarify and strengthen conceptual definitions relevant to innovation within the study.

3.3 Data Collection

Data collection constitutes a central component of the research process (Bryman & Bell, 2019). In this study, primary data were collected through semi-structured interviews with representatives from five large organizations operating across the EV-battery value chain. The aim was to conduct two interviews per organization, each one lasting between 45 to 60 minutes. The participating firms represent different stages of the battery lifecycle, including production, second-life applications, and recycling. This spread enabled the study to capture insights from multiple operational contexts involved in circular business model implementation.

Organizations were identified through industry reports, sustainability disclosures, and professional networks. Relevant organizational representatives were subsequently approached via email and LinkedIn, where the purpose of the study and participation requirements were outlined. This recruitment strategy enabled access to individuals with direct strategic and operational insight into circular initiatives within their firms. The interviews were conducted in Swedish via phone and followed a semi-structured format combining predefined thematic areas with flexibility for follow-up questions and elaboration. This format was chosen to balance comparability across cases with the ability to explore organization-specific experiences in depth (Bryman & Bell, 2019). Given that participating organizations operate in different segments of the EV-battery ecosystem and engage with circularity in distinct ways, the semi-structured approach allows shared themes to be examined while still accommodating contextual variation. Prior to each interview, a set of general guiding questions was distributed to participants. This preparatory step allowed respondents to reflect on the topics in advance and contributed to more detailed and analytically rich discussions during the interviews (Bryman & Bell, 2019).

In addition to primary data, secondary data were collected through a structured review of scientific literature retrieved primarily from the Scopus database. This provided a comprehensive theoretical foundation on CBMI, including established drivers, barriers, and business model dynamics, which informed both the interview design and subsequent analysis.

3.3.1 Sampling

The study applies purposive sampling, a strategy aimed at selecting participants who can provide relevant insights into the research question (Bryman & Bell, 2019). More specifically, criterion sampling was employed, whereby predefined selection criteria guided the identification of both organizations and individual interviewees. This approach ensured the relevance, depth, and quality of the empirical material.

At the organizational level, the sampling focused on firms operating within the EV-battery ecosystem. Selected organizations are engaged in activities related to the production, use, or second-life management of EV-batteries. To align with the study's focus on large organizations, firms were required to exceed 250 employees and report an annual turnover above €40 million, in accordance with EU classifications of large enterprises. Organizations were further selected based on their demonstrated engagement with circular initiatives relevant to the theoretical focus of the study. At the individual level, interviewees were required to hold strategic, organizational, or operational roles connected to sustainability, circular economy practices, or business model development. Preference was given to respondents in decision-making or advisory positions, as these roles provide insight into long-term strategic priorities and implementation processes. Interviewees' responsibilities included areas such as product design, second-life applications, recycling systems, and end-of-life management. This ensured their capacity to reflect on circular strategies, including value-retention practices and perceived drivers and barriers to CBMI implementation.

In total, five interviewees were selected across the participating organizations, one interviewee from each organization. Although the number of interviewees may seem limited in number, the in-depth interviews allow for analytical saturation in regards to the theoretical framework. The sampled firms occupy different positions within the EV-battery value chain but share characteristics of scale, international operations, and active involvement in circular initiatives. This variation in value chain positioning enabled the study to capture diverse organizational perspectives on CBMI implementation, ranging from production and design to recovery and second-life applications. Such diversity strengthens the analytical robustness of the findings by allowing cross-case comparison of how drivers and barriers manifest across different operational contexts within the same industry. Organizations and interviewees were

identified through organizational websites, sustainability reports, and professional networking platforms. Initial contact was established via email, where the purpose of the study and participation requirements were communicated. This selection procedure ensured both empirical relevance and access to knowledgeable informants capable of addressing the research objectives.

3.3.2 Interview Guide

The interview guide was designed to capture how large organizations experience drivers and barriers in the implementation of circular business model innovation in the EV-battery sector. It was informed by the theoretical framework, particularly the concepts of CBMI as value retention practices (Izquierdo-Montfort & De Rongé, 2025), business model components (Richardson, 2008), and drivers and barriers to CBMI (Geissdoerfer et al., 2022). The guide was structured into thematic categories that reflect these theoretical dimensions, ensuring that all interviews covered comparable areas while allowing flexibility for contextual follow-up.

Background and Organizational Context

The interviews began with opening questions such as "*What is your current role in the company?*" and "*How would you describe the company's current work with circular business models?*" to establish the respondent's position and level of involvement in CBMI. This information was necessary to contextualize how respondents interpret drivers and barriers, as strategic managers, operational specialists, and consultants may experience the circular transition differently.

Strategic Orientation

To understand how circularity is embedded in the firm's strategy and business model, respondents were asked "*To what extent are your circularity initiatives business-driven versus regulation-driven?*". The questions were designed to capture how CBMI affects the firm's value proposition and value capture logic (Richardson, 2008). Respondents were also asked "*How do you view the future of circular business models for EV-batteries, and what strategic opportunities or risks do you identify going forward?*" in order to assess whether CBMI is seen as a long-term strategic opportunity or primarily as a response to external pressure.

Market and External Environment

Several questions focused on external drivers and constraints, as highlighted by Geissdoerfer et al. (2022). These included "*How do you assess the market's maturity for circular solutions?*" and "*How do customer expectations or demands influence your work with the circular economy?*" to capture market-related drivers and barriers. Regulatory influences were explored through questions such as "*How is your work affected by uncertainty surrounding standards, quality, or safety requirements for second-life batteries?*" and "*How does the regulation affect your need for new partnerships or investments?*", particularly for producers, for whom compliance and safety requirements are critical to circular implementation.

Organizational Drivers and Resources

To examine internal enablers of CBMI, respondents were asked "*Which competencies or resources are crucial for successfully implementing circular solutions?*" and "*How do you work to ensure employees understand the organization's purpose?*" These questions were aimed at identifying organizational drivers such as skills, leadership, and employee engagement, which Izquierdo-Montfort & De Rongé (2025) identify as necessary for developing and sustaining circular practices. The question "*How do you work with employee culture and mindset to encourage more sustainable work?*" further explored how cultural factors shape the organization's ability to adopt circular business models.

Barriers and Challenges

To capture the main barriers to CBMI, respondents were asked "*What limitations (technical or otherwise) do you experience in the work with reuse and remanufacturing, particularly of EV-batteries?*" and "*What internal organizational barriers do you see, for example in terms of competence, resources, or prioritization?*" These questions addressed both operational and organizational constraints that hinder CBMI. Producers were additionally asked "*What are the biggest obstacles and challenges you face in the transition toward more circular solutions for EV-batteries?*" to capture firm-specific and industry-specific barriers related to scaling circular solutions.

Role Specific Perspectives: Consultants and Producers

While a shared core of questions was used across all interviews, certain questions were adapted to reflect the different roles of consultants and producers in the EV-battery value chain. Consultants were asked "*Which economic incentives do you see as most significant for*

increased circularity?" and "*What organizational changes or internal processes have been developed to be able to implement circularity in practice?*" These questions were designed to capture cross-company and strategic perspectives on CBMI, as consultants are typically involved in advising multiple organizations on circular transformation.

In contrast, producers were asked more operationally focused questions such as "*How is your responsibility for collecting, tracking, and recycling batteries changing?*" and "*Which factors do you consider to be the main drivers behind the company's investments in circularity and second-life cycles for batteries?*" These questions allowed the study to capture how CBMI is implemented in practice and how regulatory, technical, and organizational pressures affect day-to-day decision-making.

By structuring the interview guide around these thematic categories and integrating both shared and role-specific questions, the study ensured that all key theoretical dimensions were addressed while still allowing sensitivity to the different positions organizations occupy in the circular EV-battery ecosystem. This approach provided a robust basis for analyzing how drivers and barriers influence circular business model innovation in large organizations.

3.4 Method for Data Analysis

The main method for data analysis in this study is a thematic analysis presented by Braun & Clarke (2006). They present thematic analysis as a flexible and useful qualitative method for analysis as it ensures the process of identifying, analysing and reporting patterns, also known as themes in qualitative data. These themes do not simply exist, they are created by the researchers by actively analysing the data and by conducting a deductive analysis, this study aims to highlight the semantic and latent themes created from the empirical data.

The process of thematic analysis was followed and can be divided into six different steps. The first step is for the researchers to familiarize with the data, in this study the first step is to transcribe the audio recordings, followed by reading and re reading the empirical data that has been transcribed in order to create a full in-depth understanding of the answers provided. The second part is creating initial codes of information that the researchers highlight as significant. The third step involves dividing these initial codes into potential themes in order to better visualise what these themes represent. The fourth theme entails ensuring that the

data within each respective theme is consistent and that each individual theme relates to the data as a whole, in order to create clear and coherent themes. The fifth step revolves around clearly defining and naming themes by refining each theme and creating a clear description of what each theme is about, this makes the analysis clear and ensures that it is grounded in the theories for the study. The sixth and final step involves creating the report itself by connecting the analysis to the research question and the presented literature, creating a coherent and convincing analysis (Braun & Clarke, 2006).

In practice, the thematic analysis was conducted by both researchers together, using a deductive coding approach informed by the study's theoretical framework. Interview transcripts were first coded line-by-line to identify statements related to regulatory, market, technological, and organizational factors. These initial codes were then grouped into broader themes reflecting recurring patterns across cases. Coding was conducted manually using qualitative data organization in spreadsheets, enabling systematic comparison across interviews. The final themes were reviewed against both the empirical material and the integrated theoretical framework to ensure analytical consistency and relevance to the research question.

3.5 Ethical Considerations

All data collection procedures were conducted in accordance with Lund University´s ethical guidelines and the General Data Protection Regulation (GDPR). Participation in the study was voluntary and all interviewees provided informed consent to participate. Participants were informed about the purpose of the study, the intended use of the data and their right to withdraw at any time. The four ethical principles outlined by Diener & Crandall (1978), as cited in Bryman & Bell (2019), were carefully considered throughout the research process. These include informed consent, avoidance of deception, protection of participants integrity and confidentiality. While the boundary between full disclosure and necessary abstraction can be difficult to define in qualitative research, all participants were provided with clear and accurate information regarding the study's objectives and the role of their contribution.

3.6 Use of Generative AI tools

The use of generative artificial intelligence tools in this study complies with the guidelines provided by Lund University. AI tools were employed exclusively as a supportive resource

and did not replace independent academic work. Specifically, AI tools were used for language refinement, clarification of concepts and feedback on structure and coherence. All substantive analytical decisions, interpretations and conclusions remain the responsibility of the authors.

4. Empirical data

4.1 Interview A (Consultant)

4.1.1 Background Information

Interview A was conducted with a senior executive holding multiple key roles within the field of environmental management and producer responsibility regarding EV-batteries. At the time of the interview, the respondent serves as the Chief Executive Officer of a newly established firm, operating within the framework of extended producer responsibility and focuses on ensuring compliance with environmental regulations related to waste management and recycling.

Before this, the respondent has many years of experience as an environmental manager at a large company operating within the same broader industrial context. This background provides the respondent with both strategic and operational insights into environmental governance, regulatory compliance and sustainability-oriented business practices. The combination of executive leadership within a producer responsibility organization and hands-on environmental responsibility at a large organization positions the respondent as a knowledgeable informant regarding regulatory-driven transitions toward circular economy and CBMIs.

4.1.2 Circular Business Model Innovation

The interviewee described the organization´s work with circular business model innovation as primarily focused on enabling and coordinating circular processes rather than developing commercial products. The company’s role is to support producers in fulfilling their legal obligations related to waste management, collection, and recycling. This involves developing

systems and structures that facilitate the collection, tracking and appropriate treatment of end-of-life products within the framework of extended producer responsibility.

According to the interviewee, the organization's work with circularity is closely linked to regulatory compliance and the establishment of efficient and transparent material flows. By ensuring that materials are properly collected and treated, the organization aims to support the reintegration of resources into the value chain. CBMI within the organization is therefore described as system-oriented and incremental, focusing on improving existing processes rather than introducing entirely new business models. Collaboration was emphasized as a central component of this work. The respondent explained that circular innovation largely takes place through partnerships with producers, recyclers, and established waste management actors operating within the Swedish market. These collaborations are intended to improve collection systems, increase traceability, and ensure that materials are handled in accordance with regulatory requirements. Established waste management companies were identified as particularly important partners due to their operational experience and existing infrastructure.

When asked about how customer expectations influence how the company works towards circular economy, the interviewee described them as playing a limited role in driving circular innovation beyond regulatory requirements. "*Since our primary stakeholders are producers subject to producer responsibility legislation, expectations are mostly focused on compliance, cost efficiency and risk reduction*", she says. Producers expect the organization to provide reliable systems that ensure adherence to current and forthcoming regulations. While some producers express interest in sustainability initiatives that go beyond minimum legal requirements, the respondent noted that demand for circular solutions remains largely compliance-oriented.

The respondent also highlighted that increased public and political attention toward sustainability and circular economy issues indirectly influences expectations placed on producers and the organization. This has contributed to greater awareness of reputational risks associated with non-compliance. However, according to the interviewee, this attention has not yet translated into strong market-driven demand for circular solutions based on consumer willingness to pay.

4.1.3 Drivers & Barriers

The interviewee identified several barriers related to the transition toward circular business models. A key challenge highlighted was the difficulty of maintaining control and traceability over waste flows. According to the respondent, significant volumes of waste are exported through unregulated or illegal channels, which limits oversight and complicates responsible waste management. The lack of control over these material flows was described as "*a major obstacle to achieving circularity, as valuable resources are removed from regulated systems*".

Recent developments in producer responsibility legislation were described as having a substantial impact on both barriers and drivers of circularity. The respondent explained that new legal requirements introduce stricter sanctions for non-compliance, increasing pressure on producers to meet regulatory standards. One such requirement is the introduction of battery passports, which became mandatory for all electric vehicle batteries during the current year. The battery passport is intended to document information related to the battery's lifecycle and improve traceability. From an economic perspective, the interviewee stated that the implementation of battery passports entails increased costs for producers and battery manufacturers. These costs are expected to be passed along the value chain, resulting in higher prices for consumers. While these requirements support improved control and transparency, they were also described as a financial burden that may challenge producers' willingness and capacity to invest in circular solutions.

When asked about which factors they consider to be the main drivers behind the companies investments in circularity, legislation was consistently identified as the primary driver behind both circular practices and investments in circularity. According to the interviewee, regulatory requirements create strong incentives for producers to comply with the law, thereby influencing them to adopt more circular approaches. Investments in circularity are mainly made in response to new or updated legal obligations, such as increased traceability demands and reporting requirements. These investments include systems for data collection, monitoring, and collaboration with external partners involved in waste handling and recycling. The respondent also referred to broader European ambitions as an additional driver. The European Union's objective to electrify the vehicle fleet while keeping production, use, and recycling within Europe was described as an effort to retain the entire

value chain within the region. This ambition was linked to the goal of establishing closed-loop systems and reducing dependence on imports from outside Europe.

Overall, the interviewee emphasized that regulatory pressure, rather than voluntary market demand, constitutes the dominant driver of circular economy development within the organization's operational context.

4.2 Interview B (Consultant)

4.2.1 Background Information

The interviewee holds the position of Industry Manager for electric vehicles at a large recycling and circular solutions company and is responsible for developing and managing strategic initiatives related to the electric vehicle sector. His role involves close collaboration with large organizations and consulting clients that are engaged in sustainability transitions, including the implementation of circular business model innovations. Throughout his position, he works with analysing market developments, regulatory requirements and organizational challenges related to circularity and electrification.

The interviewee has more than 22 years of professional experience in the field of circular economy consulting, during which he has advised large organizations across multiple industries. His work has focused on supporting organizations in identifying new business opportunities, adapting existing business models and responding to sustainability-driven demands. This includes practical experience with both strategic and operational aspects of implementing circular solutions. In his current and previous roles, the interviewee has gained extensive insight into the drivers and barriers that large organizations encounter when implementing CBMI, such as organizational structures, regulatory frameworks, market conditions and strategic alignment. His long-term experience and direct involvement in CBMI-related projects make his perspective particularly relevant for addressing the research question of this study.

4.2.2 Circular Business Model Innovation

The interviewee described the venture´s current work with CBMI as an ongoing and evolving process rather than a finalized system. Circularity is integrated into the core business through

activities such as material recovery, reuse and the development of value chains for end-of-life products, particularly EV-batteries. According to the interviewee, circular practices are not treated as a separate sustainability initiative but are embedded within the corporation's overall business strategy. "*Our approach to CBMI involves close collaboration with our partners across the value chain*", he says. These partnerships include actors involved in collection, recycling and further processing of materials, and are aimed at increasing material efficiency and extending product lifecycles. The respondent emphasized that cooperation with external partners is necessary due to the technical complexity of EV-batteries and the need to coordinate multiple stages of handling, recovery and reuse.

In addition to recovery-oriented activities, the company is exploring new service-based and collaborative business models. These initiatives include solutions that go beyond traditional ownership models and instead emphasize shared responsibility and long-term material management. According to the interviewee, such models are still under development but are viewed as important components of the company's future circular strategy.

Customer expectations were highlighted as a significant influence on the company's work with CBMI. According to the interviewee, customers, particularly large industrial actors, are increasingly demanding transparency, traceability and measurable sustainability outcomes. These expectations influence the design and development of circular solutions, as the company seeks to align its offerings with customer´s environmental targets and regulatory obligations. In this regard, "*customer requirements function as a guiding factor for how circular initiatives are structured and prioritized*", he says. The interviewee further noted that access to data and digital tools plays an important role in enabling circular business models. Data related to materials, processes and product lifecycles supports transparency and traceability, which are increasingly expected by customers. The availability of skilled personnel with relevant technical and regulatory expertise was also highlighted as a key resource for advancing circular initiatives.

Employee culture and mindset were described as central to the company's ability to implement circular solutions. The interviewee explained that the venture actively promotes sustainability awareness through internal communication, training initiatives and cross-functional collaboration. Encouraging employees to move beyond traditional linear

thinking and to engage with innovation related to circularity was characterized as an ongoing effort rather than a one-time initiative.

4.2.3 Drivers and Barriers

The interviewee identified several barriers to the transition toward more circular solutions for EV-batteries. One major challenge relates to regulatory uncertainty. According to the respondent, evolving and sometimes unclear regulatory frameworks make long-term planning difficult and increase the risk associated with investments in circular solutions. This uncertainty is particularly relevant in a context where compliance requirements are still developing.

The interviewee also highlighted technical limitations as a significant barrier. He explained that the rapid pace of technological development in battery design and chemistry creates challenges for recycling and recovery processes. As new battery technologies are introduced, existing processes must be continuously adapted, which increases complexity and resource requirements. The handling of hazardous materials was further described as a challenge, requiring strict safety procedures and specialized expertise.

Economic viability was identified as an additional barrier. The interviewee noted that circular solutions often require substantial upfront investments in infrastructure, technology and competencies. While these investments may offer long-term benefits, they can be difficult to justify in the short term, particularly in the presence of market and regulatory uncertainty.

Despite these challenges, the interviewee identified several key drivers behind the company´s investments in circularity. Regulatory pressure was described as a major driver, as compliance with existing and forthcoming legislation necessitates the development of circular solutions. Customer demand was also highlighted as an important factor, particularly the requirements set by large industrial customers for transparent and traceable sustainability outcomes.

Long-term resource security was identified as another driver. According to the interviewee, ensuring access to critical materials over time motivates investments in recovery and reuse

systems. Strategic positioning was also emphasized, as the company views circular business models as a way to strengthen competitiveness and prepare for future market developments.

Looking ahead, the respondent described the future of circular business models for EV-batteries as promising but complex. While significant opportunities for value creation were identified, he also pointed to risks related to cost structures, technological change and uncertainty. Overall, the interviewee emphasized that continued investments in competencies, collaboration and adaptive capabilities will be necessary to advance circularity in this context.

4.3 Interview C (Producer)

4.3.1 Background Information

The interviewee is the sustainability manager at the corporation and has 16 years of professional experience within sustainability management. During the past several years, she has been working specifically within the vehicle industry, where environmental performance, regulatory compliance, and technological change are closely interconnected. In her current role, she operates at a strategic level and works closely with senior management, engineering teams, and business units to guide the company's sustainability agenda.

Her responsibilities include translating regulatory requirements and long-term sustainability goals into operational strategies and organizational practices. A central part of her work involves supporting the transformation of the company's operations toward improved circularity, particularly in relation to electrification and the management of key components such as batteries. Through her long experience in sustainability management, the interviewee has developed a comprehensive understanding of how environmental objectives interact with economic and technological constraints. This positions her as a reliable informant for understanding how large industrial organizations approach the transition toward circular business models within a complex and highly regulated sector.

4.3.2 Circular Business Model Innovation

The interviewee described the company´s approach to CBMI as strongly anchored in an overarching vision of sustainable circularity. The organization has set long-term goals of

becoming 100% fossil free and achieving zero landfill waste. According to the interviewee, these ambitions guide strategic decision-making across the value chain and reflect a commitment to utilizing resources to the greatest possible extent in order to minimize environmental impact. She stated that the company has increasingly recognized that a traditional sales-focused business model is no longer the most effective or profitable approach in the long term. Instead, the organization is shifting toward circular and service-based business models that emphasize user-based solutions rather than one-time product sales. By offering services related to product use, maintenance and lifecycle management, the company aims to extend product lifespans and retain greater control over resources throughout their use phase.

This transition toward service-based models enables the company to keep products within the organization for longer periods, allowing for more efficient use of materials and the creation of additional value for both customers and the environment. According to the interviewee, retaining ownership or responsibility for products makes it possible to improve maintenance programs, optimize performance and ensure that products are repaired and upgraded rather than replaced prematurely. Product design was highlighted as a key enabler of CBMI. The interviewee emphasized the importance of designing products in ways that allow specific components to be replaced or repaired without dismantling entire systems. This modular design approach enables viable components to remain in circulation for longer periods and support repair, refurbishment and reuse activities. The respondent described modularity as essential for extending product lifetimes and reducing unnecessary material consumption.

Furthermore, the interviewee stressed that circularity must be understood in a broader sense than traditional recycling practices. While recycling remains important, the organization places increasing emphasis on repair, refurbishment and reuse as more resource efficient strategies. According to the interviewee, allocation resources toward these activities is necessary to keep products and materials within closed-loop systems and to maximize their value over time.

4.3.3 Drivers & Barriers

The interviewee highlights regulation as a central driver behind the venture's transition toward circular practices. Increasingly stringent regulatory requirements demand higher

levels of control, documentation and traceability, particularly in relation to EV-batteries. These regulations enable organizations to access detailed information about products and material, which supports more effective handling, monitoring and lifecycle management. However, the interviewee noted that compliance with these requirements also creates new operational demands. Managing battery handling, mounting, monitoring and surveillance on a global scale requires advanced systems and capabilities. In response, the company has pursued strategic acquisitions of firms that already specialize in these areas. According to the respondent, this approach allows the parent company to meet regulatory requirements more efficiently while allocating internal resources toward other necessary investments.

The interviewee further explained that regulatory developments have contributed to rising costs throughout the value chain. As a result, technological advancement has become increasingly important. As the interviewee stated, "*we have made technological advancements for a while, but in order to compete, we have to advance faster*". Advancements are needed not only to reduce environmental impact but also to offset increased costs associated with regulatory compliance.

Customer expectations were described as closely linked to this need for technological progress. According to the respondent, customers require solutions that balance higher product costs with improvements in productivity and reductions in operational expenses. Consequently, the company prioritizes innovations that lower greenhouse gas emissions and pollution while simultaneously improving efficiency and economic performance for customers.

Despite significant investments in electrification and research and development, the interviewee identified internal organizational barriers related to uneven engagement across the firm. Some business units remain oriented toward established linear production and sales models, which limits commitment to circular initiatives. This creates misalignment in priorities, as departments differ in how urgently they view the transition to electrification and circularity. Established budgeting and performance systems are also designed around short-term financial returns, making it difficult to justify long-term investments in circular infrastructure. As a result, circular projects often struggle to compete with conventional projects for internal resources and management attention.

The interviewee also highlighted challenges related to EV-battery design. The lack of standardization across battery models complicates reuse, repurposing and second life applications. Batteries vary significantly in design and are not always suitable for alternative uses, which hinders the development of unified solutions and coordinated market progress. The respondent says that this fragmentation makes it difficult for businesses to align efforts toward shared circular objectives.

4.4 Interview D (Producer)

4.4.1 Background Information

The company operates within the transport sector, where environmental performance and regulatory compliance are becoming increasingly important due to growing climate targets and sustainability expectations. The interviewee has more than ten years of experience working with sustainability transformation and currently holds a role that focuses on strategic sustainability management within the organization. Her work involves ensuring that the company complies with evolving environmental regulations while also advancing longer-term sustainability ambitions.

The interviewee is responsible for coordinating sustainability-related activities across different functions of the organization, including operations, product development, and supply chain management. She plays a central role in aligning regulatory requirements with business strategy, ensuring that sustainability considerations are embedded in decision-making processes. This includes monitoring legislative developments, assessing their implications for the company, while supporting the implementation of necessary organizational changes. The interviewee's experience allows her to bridge the gap between regulatory frameworks and practical business operations. Her role places her in close contact with both internal stakeholders and external regulatory environments, making her well positioned to provide insights into how large organizations in the transport sector navigate the transition toward more sustainable and circular business practices.

4.4.2 Circular Business Model Innovation

The interviewee highlights the importance of circularity as a vital component for a successful CBMI process and product development. She explained that their main goal of circularity is

to decrease the use of primary resources by developing a more efficient closed-loop system across the value chain, especially for their EV-batteries. Circular practices are viewed as essential for improving resource efficiency and supporting long-term sustainability objectives.

A major shift in the venture´s business model was described, as they are transforming toward more service-oriented operations instead of purely sales to enhance a sustainable life cycle for their products (similar to interview C). The interviewee further explained that the company has made progress in reducing waste disposal to landfills by developing more advanced in-house waste management systems. Instead of relying on external waste handling, the organization increasingly focuses on managing waste internally in a controlled and sustainable manner. This approach supports the closed-loop system by reducing the need for additional resources related to waste management over time. When asked a follow-up question to elaborate on this, the interviewee described improved in-house management as an enabler for more effective assessment of end-of-life products. "*Having direct oversight of returned products allows us to evaluate our quality more accurately, which in turn facilitates more efficient and cost-effective reuse, refurbishment and repurposing*", she says. This internal capability strengthens the organization´s ability to retain materials within the value chain and supports the development of circular business models.

In addition, the interviewee highlighted efforts to eliminate waste and increase reuse of materials across production processes. By integrating circularity into product development and operational routines, the company aims to reduce resource intensity while maintaining product quality and performance.

4.4.3 Drivers & Barriers

Regulation was identified by the interviewee as a key driver behind the company's transition toward circular business models. New legislative requirements mandate that products must contain specific percentages of recycled plastics and recycled materials from end-of-life vehicles. According to the respondent, these requirements directly reduce the need for primary resources and support the company´s ambition to achieve net-zero waste production. At the same time, she emphasized that regulatory requirements create both opportunities and challenges.

While legislation provides direction and motivation for circular practices, it has also contributed to increased production costs. These higher costs cannot be fully passed on to customers, resulting in pressure on profit margins. As a consequence, the company is required to become more cost-efficient in its operations while continuing to deliver high quality products and affordable services. Customer value was described as an important consideration in this context. According to the interviewee, the company aims to balance regulatory compliance with the ability to offer competitive and accessible solutions. One example mentioned was the development of battery-as-a-service (BaaS) offerings, which allow the company to retain ownership of batteries while providing them to customers through subscription-based models. This approach supports circularity by maintaining control over batteries throughout their lifecycle and reducing incentives for premature disposal.

Despite these initiatives, the interviewee expressed concerns regarding market uncertainty. The evolving regulatory landscape and rapidly changing market conditions make it difficult to predict long-term outcomes. As a result, the company has adopted a cautious investment strategy, postponing large upfront investments until market developments become clearer. According to the interviewee, this uncertainty affects decision-making related to scaling circular solutions.

The interviewee explained that regulatory and market changes require stronger internal coordination, but existing organizational structures create barriers to this shift. Functions such as product development, operations, sustainability, and customer services operate with different objectives and performance metrics, which complicates collaboration around circular goals. As the company moves toward service-based and lifecycle-oriented business models, responsibilities for products after sale remain fragmented across departments. This lack of clear ownership slows the development of circular processes such as reuse and reverse logistics. According to the interviewee, building effective cross-functional structures requires organizational changes that are still in progress.

4.5 Interview E (Producer)

4.5.1 Background Information

The interviewee is a sustainability manager at a Swedish multinational company operating primarily within the commercial vehicle industry. She has more than 15 years of experience working with sustainability-related issues and has been employed by the company for over 10 years. This long tenure has given her detailed insight into both the company's historical business model and its ongoing strategic transformation.

Traditionally, the company's core business has been built around the production and sale of high-quality, durable vehicles, supported by a strong focus on operational efficiency, long product lifecycles, and extensive aftermarket services. These characteristics have provided a foundation for circular practices such as remanufacturing, reuse, and lifecycle management. In recent years, sustainability has become an increasingly important strategic priority within the organization, influencing decisions related to product design, business models, and value chain management. In her role, the interviewee works with integrating sustainability goals into the company's broader strategy and operations. She collaborates with multiple departments to ensure that environmental objectives are aligned with commercial and technical considerations, making her a key informant on the company's transition toward circular business models.

4.5.2 Circular Business Model Innovation

According to the interviewee, the company is actively engaged in developing and implementing CBMI, particularly in relation to electric vehicles and battery systems. In recent years, the venture has increasingly positioned sustainability and circularity as a strategic priority within its business operations. "*Current circular practices focus on extending product lifecycles through remanufacturing, reuse and refurbishment of components*", the interviewee says. She highlighted that the company has traditionally operated with a sales-based business model centered on selling trucks and buses. However, this approach is evolving to include service-oriented offerings, such as leasing vehicles or selling usage-based solutions measured in operating hours. These models enable reuse and lifecycle extension while allowing the company to retain ownership, monitor performance and manage key components throughout their lifespan.

Battery systems were identified as a particularly important area for circular innovation. The company is exploring second life applications for EV-batteries, with the aim of retaining value after their initial use phase. These initiatives are linked to service-based business models and lifecycle management strategies, where batteries and other critical components remain within controlled systems rather than exiting the value chain prematurely. The interviewee also described how circularity influences product development and manufacturing processes. The company works to reduce the use of virgin materials, increase the share of recycled and renewable materials and design products for disassembly and reuse. Modular design principles and remanufacturing capabilities are described as "*important enablers of circularity*". One example highlighted was the introduction of remanufactured parts into the main production flow, enabling reused components to meet quality standards comparable to new parts.

CBMI is supported through cross-functional collaboration across product development, manufacturing, sustainability and aftermarket services. The interviewee emphasized that expanding circular practices beyond internal processes to encompass the entire vehicle lifecycle requires organizational engagement and coordination. According to the interviewee, while several circular activities already exist, they have historically been operated with a linear mindset, leaving significant lifecycle potential untapped.

4.5.3 Drivers & Barriers

The interviewee counts several drivers behind the venture´s investments in circular business models and second life battery solutions. Regulatory pressure was described as a central driver, as increasingly stringent environmental regulations and climate targets at both national and EU levels require reduced emissions and more efficient resource use. Compliance with these regulations necessitates changes in product design, production and business models. Economic drivers were also emphasized, as rising material costs and concerns about long-term access to critical raw materials for batteries, such as lithium and cobalt, strengthen the rationale for retaining value within closed-loop systems. Circular practices are viewed as a way to mitigate resource-related risks and reduce dependency on volatile raw material markets. Market-related drivers were further highlighted, including growing customer demand for sustainable transport solutions and lower total cost of ownership. According to

the interviewee, these demands incentivize the development of circular offerings that combine environmental and economic value.

Despite these drivers, she described the transition toward more circular solutions as complex and challenging. When asked about what limitations the company experiences regarding reuse and remanufacturing of EV-batteries, the interviewee identified technological uncertainty as a major barrier, "*particularly in relation to battery degradation, safety and performance in second life applications*". The lack of standardization in battery design and limited data availability further complicate reuse and repurposing processes. She states that "*rapid technological development makes it difficult for us and the whole industry to establish stable and scalable circular solutions*". Economic barriers were also mentioned by the interviewee, as high upfront investment costs, uncertain profitability and immature secondary markets for used batteries create financial risks that may slow large-scale implementation.

When asked about internal organizational challenges, the interviewee highlights a few. One key issue concerns the impact of circular business models on existing financial metrics and key performance indicators. "*Shifting from only product sales to include service-based models in our strategy has affected our balance sheets and revenue recognition, which in turn influence access to financing*", she says. According to the interviewee, the company has received concerns from banks, investors and other stakeholders regarding these changes which have posed obstacles to implementation. Furthermore, aligning circular initiatives with established linear business models was described as perhaps the most significant challenge for the company. Cross-functional coordination between departments was identified as essential but difficult due to differing objectives, responsibilities and performance measures. Overcoming these internal barriers requires changes in both organizational structures and mindsets.

Looking forward, the interviewee described the future of circular business models for EV-batteries as both promising and uncertain. Second life battery applications are viewed as an opportunity to create new revenue streams and strengthen customer relationships through extended service offerings. At the same time, future progress is seen as dependent on technological development, regulatory clarity and the establishment of viable market structures.

5. Analysis

In this chapter, the empirical findings are analyzed through the integrated theoretical framework presented in Chapter 2. Rather than examining CBMI, business model change, and drivers and barriers separately, the analysis explores how circular practices are implemented within different business model dimensions and how various drivers and barriers influence this implementation process. While producers and consultants were asked partially differentiated questions, the analysis adopts a comparative but integrated perspective. This is possible as both actor groups operate within the same EV-battery ecosystem and provide complementary insights into CBMI implementation. Where relevant, distinctions between producers and consultants are highlighted analytically.

5.1 Circular Business Model Innovation

The empirical data show that large organizations are in an ongoing transition from linear to circular business models. This transition is primarily visible through the gradual introduction of value retention practices such as reuse, refurbishment, remanufacturing, and second-life applications for EV-batteries. These practices reflect the CBMI patterns identified by Izquierdo-Montfort & De Rongé (2025) and are most prominently implemented within the value creation and delivery dimension of the business model. Organizations describe the development of reverse logistics systems, cross-sector partnerships, and lifecycle monitoring capabilities as necessary operational changes enabling circularity.

At the level of value proposition, firms increasingly complement product sales with service-based offerings such as leasing and subscription models. These models allow organizations to retain ownership of battery assets, thereby preserving resource value and enabling lifecycle optimization. However, the implementation of these practices is strongly shaped by external and internal drivers and barriers. Regulatory pressure, particularly linked to traceability requirements and battery passports, acts as a primary driver accelerating circular business model transformation. Simultaneously, organizational restructuring and cross-functional collaboration emerge as necessary internal enablers. Despite these developments, the data indicate that many firms remain partially embedded in linear business logics. Circular initiatives are often implemented incrementally rather than through full

business model transformation, suggesting that CBMI implementation is an evolutionary process shaped by both enabling and constraining forces (Geissdoerfer et al., 2022).

While organizations have traditionally focused mainly on recycling as a way of demonstrating circular practices, the empirical data shows that remanufacturing, reuse, refurbishment and second-life applications are becoming increasingly apparent as strategies to enhance the closed loop system and further develop the circular business model. Furthermore, both interviewees in company C and E emphasize the importance of designing and constructing products in a way that enables for individual components to be replaced, commonly referred to as modularity, which allows for an extension of the product's life cycle.

These practices are aligning with the components of the 9R strategy directly (Richardson, 2008), which reflect the CBMI process related to value creation, as businesses are altering the fundamental process of what they do in order to create value for their consumers.

In addition, the empirical data highlights that technological advances within the EV-battery industry are not the primary drivers for a successful CBMI implementation. Instead, regulations and organizational changes such as cross-functional collaboration throughout the entire value chain, both internally and externally, are shown to be crucial for a successful CBMI implementation.

Commonly shown throughout the data is that today's business models are still to some extent revolving around the traditional linear business model which results in resources being underutilized. This suggests that while large organizations are still far from successfully implementing an efficient circular business model, they are undergoing the process towards CBMI, relating back to Geissdoerfer et al.´s (2022) conceptualization of CBMI as a consistent developing process.

5.2 Drivers & Barriers

The implementation of CBMI is shaped by a combination of enabling and constraining factors. While certain drivers accelerate the adoption and scaling of circular practices, multiple barriers simultaneously limit the speed and scope of implementation. The following

sections analyze these drivers and barriers in relation to specific business model dimensions and phases of CBMI implementation.

5.2.1 Drivers

The empirical analysis identifies regulatory pressure as one of the most influential drivers of CBMI implementation. Regulations relating to traceability, extended producer responsibility, and battery lifecycle management incentivize organizations to redesign both operational processes and revenue models. Within the integrated framework, regulation primarily drives change in value creation systems, particularly through requirements for tracking, recovery, and recycling infrastructure. Moreover, regulatory cost pressures motivate firms to innovate within value capture mechanisms, for instance through service-based revenue models that retain asset ownership.

The empirical findings highlight strategic partnerships as an important driver of CBMI (Geissdoerfer et al., 2022), emphasizing the role of collaboration across the value chain in enabling the recovery, reuse, and life cycle extension of EV-batteries. The data suggests that such partnerships are not merely operational arrangements but central to how value is created in circular systems. In particular, Interview A highlights the importance of collaboration with waste management actors to ensure that producer responsibility requirements are met and that waste flows are managed efficiently. This indicates that implementing CBMI in large organizations requires firms to move beyond internally focused optimization strategies and instead coordinate value creation across multiple actors (Richardson, 2008). In this sense, value creation appears to depend less on internal control and more on the abil ity to orchestrate relationships and material flows across the value chain. These findings are particularly interesting as they challenge producers' assumptions that increased in-house management necessarily reduces costs. Instead, the empirical data suggests that internalizing circular activities may overlook efficiency gains achieved through specialized partners. This indicates that cost considerations in circular business models are shaped not only by internal efficiency but also by how financial incentives and responsibilities are distributed across actors in the value chain.

Moreover, the empirical data highlights the organizational community as another driver of CBMI. Increased awareness and a stronger sustainability mindset among employees appear to

be important for embedding circular economy principles in everyday practices. However, the continued need for awareness-building suggests that cultural change remains incomplete. This indicates that successful implementation of CBMI depends not only on structural changes but also on organizations' capacity to translate circular ambitions into operational practices through employee engagement and shared understanding (Atkova et al., 2025).

5.2.2 Barriers

Financial constraints emerge as one of the most significant barriers to CBMI implementation. High upfront investments in infrastructure, reverse logistics, and recycling technologies limit organizations' ability to scale circular initiatives. Within the business model framework, these barriers primarily affect value capture, as uncertain profit margins and long return-on-investment periods reduce financial viability.

The empirical data also identifies the need for technological development as another barrier, particularly concerning the development of the EV-batteries. While technological developments are necessary and continuous, the development does not appear to address the issues of standardization which is limiting the market's capabilities for reuse and second-life application, and may therefore contribute to the increased development of in-house waste management. This combination of rising costs and technological challenges hinders organizations to successfully scale the circular economy in a rapidly growing market, thereby aligning earlier findings of technological ignorance as one major barrier for CBMIs value creation. Moreover, the continuous need for adapting the process of recycling and recovery to accommodate new battery chemistries represents additional technological as well as operational barriers. Such rapid change has proven challenging for large organizations as their existing structure, systems and processes are not yet optimized for this dynamic environment.

Geissdoerfer et al. (2022) further emphasizes financial barriers as one of the most prominent factors limiting the implementation of CBMI and Richardson (2008) explains that these barriers greatly affect organizations' ability to capture value. The empirical data shows that rising costs and the need for large investments represent some of the most significant issues today and highlights the necessity for further investment in infrastructure, R&D and new systems. However, due to uncertain profit margins and that the market for second-life

batteries still requires maturity, organizations tend to continue forward with more caution. These investments inevitably increase the cost per product across the value chain, ultimately affecting consumers. Consequently, this can be seen as a motivator for organizations to adopt a service-based model in order to satisfy consumers while simultaneously improving financial profitability. Nevertheless, these changes toward service-oriented business models result in additional challenges as highlighted in interview E. By transitioning from sales to service offerings, organizations may affect their balance sheets negatively and thereby raising concerns among external stakeholders, weakening their position when seeking further investments or loans.

Regulations also represent one of the key barriers for adopting circularity. The empirical data shows that current regulations function both as a driver and a barrier. While they enable security and efficiency to strengthen the possibilities of reuse and refurbishing, the regulatory uncertainty of the future stagnates long-term investments and the willingness to scale, as organizations cannot anticipate how future rules and regulations will affect their operations and business models.

The necessary process of CBMI together with the drivers and barriers driving this transformation forward has resulted in the value chain becoming more complex. The issue of illegal exports of EV-batteries remains, complicating the required documentation and control, exerting a constant pressure for successfully developing a cost effective closed-loop system of circularity as finite and valuable materials are removed from the loop. This is prominent in organizations acting as intermediaries between end-of-life products and second-life products, which may further explain the reasoning why organizations continuously develop their in-house waste management.

As the empirical data suggests, there are several drivers and barriers for the successful implementation of CBMI, such as regulations, financials, market demands and technological challenges. However, the most prominent of complex problems arises from all presented drivers and barriers. As shown in the data, in order to adapt to these challenges and opportunities, organizations require a great reconstruction of the organization internally. Large organizations are tenacious to current structure and systems, so for change to happen, every employee and stakeholder has to be on board and agree on the direction the organization wishes to take.

Across the empirical material, drivers and barriers manifest differently depending on the phase of CBMI implementation. Regulatory drivers are particularly influential in early adoption phases, motivating firms to initiate circular practices. Technological and financial barriers become more prominent during scaling phases, where infrastructure investments and standardization challenges limit expansion. Organizational and cultural factors, meanwhile, shape the long-term institutionalization of circular business models within firm structures.

It is important to acknowledge a potential selection bias within the sample. As participating organizations were selected partly based on their active engagement with circular initiatives, interviewees may hold more advanced or favorable views on circularity than the broader industry population. Consequently, the prominence of circular drivers identified in the analysis should be interpreted in light of this sampling characteristic.

6. Discussion and Conclusion

This chapter will present the conclusions of this study and discuss the findings presented in the analysis. It also presents suggestions for future research based on the theoretical and practical limitations of this study and finally presents practical implications from which large organizations can draw inspiration from.

6.1 Conclusion

The purpose of this study was to explore how large organizations alter their business models when implementing circular business model innovation (CBMI), and which drivers and barriers they experience in this process. The research question guiding the study was:

What drivers and barriers do large organizations experience when implementing CBMI?

Based on the empirical findings, this study concludes that CBMI implementation in the EV-battery industry is primarily shaped by the interaction between regulatory pressure and financial risk. Regulations function simultaneously as catalysts and constraints. On the one hand, policy instruments such as extended producer responsibility and battery passport

requirements accelerate circular transformation by demanding traceability, life cycle accountability, and resource recovery systems. On the other hand, regulatory uncertainty, particularly concerning future standards and compliance requirements, creates investment hesitation and slows large-scale circular infrastructure development. Financial barriers emerge as closely interlinked with regulatory dynamics. Organizations must make substantial upfront investments in technological systems, reverse logistics, service infrastructures, and product redesign long before circular revenue streams stabilize. This creates a temporal misalignment between cost exposure and value capture, making CBMI implementation financially risky despite its long-term strategic necessity.

The study further finds that regulatory and financial pressures drive business model transformation toward service-oriented logics. Leasing, battery-as-a-service, and life cycle management models enable firms to retain ownership of battery assets, facilitating value-retention practices such as reuse, remanufacturing, and refurbishment. These shifts require redesign not only of products but of organizational capabilities, partnerships, and digital infrastructures. Technological development plays a dual role. While advances in diagnostics, tracking, and recovery systems enable circularity, the absence of standardized battery designs and harmonized regulations generates fragmented innovation trajectories. As a result, technological investments risk becoming misaligned with future regulatory and market conditions. Overall, CBMI implementation in large EV-battery organizations can be understood as a regulation-induced but financially constrained transformation process, in which firms incrementally restructure their business models toward circular value retention.

6.2 Discussion

This study contributes to the integrated understanding of circular business model innovation by examining how CBMI practices, business model transformation, and drivers and barriers interact within the specific context of the EV-battery industry. While previous literature has identified regulatory, financial, technological, and organizational factors as relevant drivers and barriers, this study demonstrates that these factors do not operate independently. Instead, the findings suggest a hierarchical dynamic in which regulatory pressure and financial exposure function as primary structuring forces that generate secondary organizational and technological consequences. This expands the framework of Geissdoerfer et al. (2022) by showing that drivers and barriers may be causally interlinked rather than categorically

separate. For instance, regulatory traceability requirements drive technological investment in tracking systems, which in turn creates financial strain and organizational restructuring needs. Drivers in one dimension therefore produce barriers in another. By integrating Richardson's (2008) business model perspective, the study further shows where these pressures materialize within firms. Regulatory and financial forces primarily reshape value creation systems through reverse logistics and life cycle monitoring, while simultaneously transforming value capture mechanisms through service-based revenue models. This demonstrates that CBMI implementation is not confined to sustainability functions but affects the core economic logic of the firm. The value-retention practices identified by Izquierdo-Montfort & De Rongé (2025), such as reuse, remanufacturing, and refurbishment, are therefore not merely operational practices but strategic responses to regulatory and financial conditions. In the EV-battery industry, circular practices emerge less as voluntary sustainability innovations and more as structurally induced business model adaptations.

The findings also highlight that technological development functions both as a driver and a barrier, however not as prominent as first expected. While innovation in tracking systems, battery diagnostics, and remanufacturing techniques enables higher levels of circularity, the lack of standardized battery designs and an uncertain regulatory future creates fragmented technological trajectories. This aligns with Izquierdo-Montfort & De Rongé's (2025) argument that value-retention practices require systemic coordination across product design, supply chains, and end-of-life management. When this coordination is missing, technological investments risk becoming stranded or misaligned with future regulatory requirements.

Organizational factors such as employee competence, company culture and internal coordination did not develop in isolation. In the cases studied, they were largely shaped by external pressures, especially regulation and financial constraints. For instance, companies invested in new skills and systems mainly because new rules required better traceability and compliance, not because of an internal desire to innovate. At the same time, limited resources and competing priorities across departments made it difficult for organizations to adapt quickly, even when the strategic direction was clear.

Overall, this study demonstrates that CBMI in large organizations is not primarily constrained by lack of ambition or awareness. It is instead the interaction between regulation, financial risk, technological uncertainty and organizational issues. This dynamic creates a situation in

which circular innovation is both strategically necessary and operationally difficult, producing the repetitive cycle of drivers and barriers observed in the empirical data.

Beyond the EV-battery context, the findings may also provide insights for other industries undergoing circular transitions. Sectors with complex products and regulated life cycles, such as electronics or renewable energy technologies, face similar interactions between regulatory pressure, technological uncertainty, and financial risk. While industry conditions differ, the hierarchical relationship between drivers and barriers identified in this study may therefore also help explain CBMI challenges in other resource-intensive sectors.

Despite these insights, this study has several limitations that should be considered when interpreting the findings. First, the empirical material is based on a limited number of interviews within a specific industrial context, which means that the results cannot be statistically generalized. The EV-battery industry is characterized by particularly strong regulatory pressure and technological complexity which may amplify certain drivers and barriers compared to other sectors. The study also relies on self-reported perceptions from organizational representatives and while this provides valuable insight into managerial and strategic reasoning, it does not fully capture informal practices, internal conflicts, or long-term outcomes of CBMI. Furthermore, as regulation in this field is rapidly evolving, the findings reflect the present and may change as policies, standards, and market conditions become more settled.

6.3 Future Research

This study opens up for several opportunities for future research into circular business model innovation. Firstly, while the EV-battery industry represents a highly regulated and technologically advanced environment, future studies should examine whether similar patterns of regulatory and financial factors are as obvious in other industries. Sectors such as construction, fashion, or chemicals may face different regulatory challenges and technological constraints, which could lead to different constellations of drivers and barriers.

Another area for future research should investigate how small and medium-sized organizations experience CBMI compared to large organizations. SMEs may face fewer organizational challenges but stronger financial and technological constraints. Comparing

SMEs and large firms could deepen understanding of how organizational size moderates the impact of regulation, investment capacity, and innovation capability on circular business models.

A third area for future study should research longitudinal studies and how this would be valuable to capture how drivers and barriers evolve over time. Following organizations across regulatory changes would allow researchers to examine how firms adapt their business models and whether early investments in circular technologies generate competitive advantages or stranded assets.

Finally, building on the integrated framework developed in this study, future research can further refine the cyclical and hierarchical relationships between drivers and barriers across different industrial contexts.

6.4 Practical Contribution

This study provides a practical extension of existing CBMI frameworks within the context of the EV-battery industry. As well as valuable information for organizations, within and outside the research industry. For organizations within the EV-battery industry, the findings highlight the practical challenges and opportunities that they face and how firms address these. The study also highlights different approaches to enhance circular business models, suggesting that recycling as a means to circularity is not enough.

Several practical insights are highlighted for managers, policymakers, and industry actors involved in the transition toward circular business models. For large organizations in the EV-battery industry, the findings highlight that circularity cannot be achieved through recycling alone. Instead, firms must actively invest in value-retention practices such as remanufacturing, reuse, and refurbishment, supported by service-based business models. Designing batteries and systems for disassembly, diagnostics, and second-life use is therefore not only an environmental requirement but also a strategic necessity.

The results also suggest that regulatory stability is as important as regulatory ambition. Policymakers aiming to accelerate circularity should focus on creating clear, harmonized and predictable frameworks for battery standards, safety, and traceability. Reducing uncertainty

would enable firms to make long-term investments in circular infrastructure with greater confidence.

For managers, the study highlights the importance of aligning organizational capabilities with circular strategies. Investments in digital systems, employee competence and cross-functional collaboration are critical to turning regulatory pressure into business opportunities. Firms that successfully integrate circularity into their value proposition through leasing, BaaS, or performance-based offerings are better positioned to capture value from extended product life cycles.

Lastly, existing CBMI frameworks typically identify individual drivers and barriers as either a main driver or barrier. However, the empirical findings show that within the EV-battery industry they are not static nor independent. Instead, they work in a repetitive and interdependent cycle. To conceptualize this cycle based on our findings, it begins with either a regulatory or market change, driving innovation and experimentation forward. This results in external or internal organizational limitations, which in turn drives collaboration and structural change. This strengthens organizations knowledge and possibilities, creating more opportunities. Which ultimately results in new regulations, technological advancements or market demands to appear, and so the cycle continues. With this visualization, organizations can better understand that the CBMI process is a continuously developing process, where the goal is to better adapt through risk, experimentation and collaboration instead of merely optimizing.

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Appendix

Intervjuguide - Svenska

- *Vilken är din nuvarande roll i företaget?*
- *Hur skulle du beskriva företagets nuvarande arbete med cirkulära affärsmodeller?*
- *I vilken utsträckning är era cirkularitetsinitiativ affärsdrivna respektive regelverksdrivna?*
- *Hur påverkar kundernas förväntningar eller krav ert arbete med den cirkulära ekonomin?*
- *Hur ser du på framtiden för cirkulära affärsmodeller för elbilsbatterier, och vilka strategiska möjligheter eller risker ser du om du tänker framåt?*
- *Hur bedömer du marknadens mognad för cirkulära lösningar?*
- *Vilka kompetenser eller resurser är avgörande för att framgångsrikt implementera cirkulära lösningar?*
- *Hur påverkar regelverken ert behov av nya partnerskap eller investeringar?*
- *Hur påverkas ert arbete av osäkerhet kring standarder, kvalitet eller säkerhetskrav för second life-batterier?*
- *Vilka kompetenser eller resurser är avgörande för att framgångsrikt implementera cirkulära lösningar?*
- *Hur arbetar ni för att säkerställa att medarbetarna förstår organisationens syfte?*
- *Hur arbetar ni med arbetskultur och mindset för att uppmuntra ett mer hållbart arbetssätt?*
- *Vilka begränsningar (tekniska eller andra) upplever ni i arbetet med reuse och remanufacturing, särskilt av elbilsbatterier?*
- *Vilka interna organisatoriska hinder ser du, till exempel när det gäller kompetens, resurser eller prioriteringar?*
- *Vilka är de största hindren och utmaningar ni möter i omställningen mot mer cirkulära lösningar för elbilsbatterier?*
- *Vilka ekonomiska incitament ser du som mest betydelsefulla för ökad cirkularitet?*
- *Vilka organisatoriska förändringar eller interna processer har utvecklats för att kunna implementera cirkularitet i praktiken?*
- *Hur förändras ert ansvar för insamling, spårning och återvinning av batterier?*
- *Vilka faktorer anser du vara de främsta drivkrafterna bakom företagets investeringar i cirkularitet och second life cykler för batterier?*

Interview guide - English

- *What is your current role in the company?*
- *How would you describe the company's current work with circular business models?*
- *To what extent are your circularity initiatives business-driven versus regulation-driven?*
- *How do you view the future of circular business models for EV batteries, and what strategic opportunities or risks do you identify going forward?*
- *How do you assess the market's maturity for circular solutions?*
- *How do customer expectations or demands influence your work with the circular economy?*
- *How is your work affected by uncertainty surrounding standards, quality, or safety requirements for second-life batteries?*
- *How does the regulation affect your need for new partnerships or investments?*
- *Which competencies or resources are crucial for successfully implementing circular solutions?*
- *How do you work to ensure employees understand the organization's purpose?*
- *How do you work with employee culture and mindset to encourage more sustainable work?*
- *What limitations (technical or otherwise) do you experience in the work with reuse and remanufacturing, particularly of EV batteries?*
- *What internal organizational barriers do you see, for example in terms of competence, resources, or prioritization?*
- *What are the biggest obstacles and challenges you face in the transition toward more circular solutions for EV batteries?*
- *Which economic incentives do you see as most significant for increased circularity?*
- *What organizational changes or internal processes have been developed to be able to implement circularity in practice?*
- *How is your responsibility for collecting, tracking, and recycling batteries changing?*
- *Which factors do you consider to be the main drivers behind the company's investments in circularity and second-life cycles for batteries?*

Chat GPT prompts:

- Keep the same sentence structure and text, but make the sentences flow better and improve the transitions between paragraphs
- Make the main point about … clearer in this paragraph
- Give me synonyms for…