



# From Waste Management Towards Resource Management

*A qualitative study on the use of management control systems  
towards circular economy in Norwegian waste management  
companies*

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This thesis was written as a part of the Master of Science in Economics and Business Administration at NHH. Please note that neither the institution nor the examiners are responsible – through the approval of this thesis – for the theories and methods used, or results and conclusions drawn in this work.



## Abstract

**Purpose** – The purpose of this thesis is to demonstrate how management control systems are used towards circular economy. As well as contributing to the demand for research regarding management control systems with the integration of sustainable development in companies.

**Design/methodology/approach** – This paper is a qualitative multiple-case study of five waste management companies, where data are obtained through 11 interviews with managers.

**Findings** – The thesis concludes with all five control systems being used to direct behavior towards circular economy. There is a necessity to view the different controls in conjunction with each other. Further, the study implies that how some of the control systems are used, they can have limited ability to control behavior.

**Originality/Value** – Compared to research on management control systems in the aspect of sustainability, this thesis stands out by focusing on the circular economy. Thereby highlighting the use of different control systems and the interaction between them to manage the behavior of employees towards circular economy. Further, the thesis is a contribution to research within the field.

## Acknowledgment

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# Contents

<b>Abstract</b> .....	<b>i</b>
<b>Acknowledgment</b> .....	<b>ii</b>
<b>Table of Figures</b> .....	<b>vi</b>
<b>1. Introduction</b> .....	<b>1</b>
1.1 Background .....	1
1.2 Purpose and research question.....	2
1.3 Scope of the thesis and delimitations .....	4
1.4 Thesis structure.....	4
<b>2. Theory</b> .....	<b>6</b>
2.1 Organizational incentive theory .....	6
2.1.1 The principal agency theory .....	7
2.1.2 Gibbons (1998) – The classic agency model.....	8
2.1.3 Incentives in practice .....	11
2.1.4 Limits in the use of external incentives .....	12
2.2 Sustainability .....	13
2.2.1 Circular economy .....	14
2.3 Circular business model .....	18
2.4 Management control systems .....	20
2.4.1 Simons (1995) – Levers of control.....	21
2.4.2 Malmi & Brown (2008) – Management control systems as a package.....	23
2.4.3 The decision of management control systems approach .....	25
2.5 Sustainability management control .....	25
2.5.1 The case of waste management .....	27
2.6 Research questions .....	29
2.6.1 Theoretical framework .....	37
<b>3. Methodology</b> .....	<b>38</b>
3.1 Research philosophy.....	38
3.2 Research approach.....	39

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3.3	Research design.....	39
3.3.1	The purpose of the research .....	40
3.3.2	Research strategy.....	40
3.3.3	Time horizon .....	42
3.4	Data collection.....	42
3.4.1	Primary data .....	42
3.4.2	Secondary data .....	44
3.5	Data analysis .....	44
3.6	Data quality .....	45
3.6.1	Reliability .....	46
3.6.2	Validity.....	48
3.7	Research ethics .....	49
<b>4.</b>	<b>Results .....</b>	<b>51</b>
4.1	Cultural controls.....	51
4.2	Planning controls.....	57
4.3	Cybernetic controls .....	62
4.4	Reward and compensation controls.....	70
4.5	Administrative controls .....	73
<b>5.</b>	<b>Discussion.....</b>	<b>79</b>
5.1	Theoretical implications .....	79
5.2	Practical implications .....	85
5.3	Limitations .....	90
5.3.1	Theoretical limitations.....	90
5.3.1	Methodological limitations .....	91
5.4	Future research .....	93
5.4.1	Replication of the research .....	93
5.4.2	The effect of collaboration towards circular economy.....	94
5.4.3	Drivers and barriers towards circular economy .....	95
<b>6.</b>	<b>Conclusion.....</b>	<b>97</b>
	<b>References .....</b>	<b>98</b>

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<b>Appendix .....</b>	<b>107</b>
Appendix A – Overview of respondents .....	107
Appendix B – Interview guide .....	108
Appendix C – Declaration of consent .....	109
Appendix D – Overview of secondary data .....	111
Appendix E – Explanation of quotations format .....	112

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# Table of Figures

Figure 1: Theoretical framework..... 37



# 1. Introduction

This chapter presents the background of the master thesis, as well as the purpose and main research question. Followingly, the scope of the thesis and delimitations are elaborated before the structure of the thesis is accounted for.

## 1.1 Background

There is a global consensus that sustainable development is one of the greatest concerns of society today (Bebbington & Unerman, 2018; Clune & O’Dwyer, 2020). The United Nations (UN) defines sustainable development as a “[...] development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (The World Commission on Environment and Development, 1987, p. 42). In accordance, the UN has formed 17 Sustainable Development Goals (SDGs) as an action plan towards sustainable development by 2030 (FN, 2022a). One of the SDGs is “responsible use and production,” which consists of reducing overconsumption and increasing sustainable living (FN, 2022b). The uncritical use of resources in the past, combined with population growth, has led to the environment showing signs of fatigue (Stockholm Resilience Centre, 2015, p. 3-5). Earth Overshoot Day represents when renewable resources, regenerated during a year, are used up, and the resources for the rest of the year are on “credit” (Earth Overshoot Day, n.d.a). In 2022, the day fell on July 28, which equals a resource consumption equivalent to 1.75 Earths (Earth Overshoot Day, n.d.b). The practice of today is thus not in line with sustainable development (Bruyninckx, 2017). A possible solution to reduce the need for new resources and preserve the resources in the value chain is circular economy (Jørgensen & Pedersen, 2018, p. 105-106).

Circular economy is a change from the previous dominating linear value chain consisting of “taking, making, and disposing” the resources, where there is a constricted focus on preserving the resources in the value chain (Jørgensen & Pedersen, 2018, p. 105). Circular economy stimulates a more sustainable use of resources aligned with the capacity of the Earth (Ghisellini et al., 2016, p. 12). The essence is slowing, closing, and narrowing the resource flows (Bocken et al., 2016, p. 309). Circular economy thereby causes a change in the design of products, services, and the value chain to utilize resources more efficiently (Jørgensen & Pedersen, 2018, p. 107). The adoption of circular economy causes a change in the value creation and business models of companies (Lüdeke-Freund et al., 2019, p. 36).

Accordingly, the management control systems thus must be changed in line with the strategy and objectives of the company (Gond et al., 2012, p. 206). To enable sustainability in an organization, values to measure and supervise the development are necessary. The measures and management for corporate sustainability require a comprehensive perspective rather than isolated measurements (Maas et al., 2016, p. 237-238). However, management control from a sustainability perspective occurs only in a few empirical studies (Crutzen et al., 2017; Ditillo & Lisi, 2014). Therefore, there is a need for knowledge about how management control systems contribute to the integration of sustainable development in companies (Ditillo & Lisi, 2016; Gond et al., 2012; Lueg & Radlach, 2016; Maas et al., 2016). The existing research literature consists of a separate focus on management control systems and control systems for sustainability. A focus on how sustainable control systems affect traditional management control systems is not included in recent research (Ditillo & Lisi, 2016; Gond et al., 2012). Despite the need for a more comprehensive management system (Maas et al., 2016, p. 238).

In the existing research literature, external business communication regarding sustainable reporting has been widely researched (Ditillo & Lisi, 2016; Riccaboni & Leone, 2010). This, regardless of external reporting with sustainable performance measurements, is argued to be inadequate without internal control and management. Therefore, internal management is necessary to manage the contribution of companies to sustainable development (Ditillo & Lisi, 2016; Riccaboni & Leone, 2010). Accordingly, this research consists of an aspect of management control where the internal factors are represented. A framework that contains a holistic perspective of management control systems is the framework of Malmi and Brown (2008), and only a few former studies have utilized this framework in an aspect of sustainability (Crutzen et al., 2017, p. 1291).

## 1.2 Purpose and research question

Circular economy consists of elements that cause a reduction in waste creation and the need for new recourses (Govindan & Hasanagic, 2018, p. 279). Therefore, in the transition towards circular economy, appropriate waste management is essential to treat waste as a resource (Ranjbari et al., 2021, p. 2). Circular Norway states a great potential for circular economy, hence only 2.4% of resources today are circular, and accordingly, there is a potential of 46% circularity (Circular Norway, n.d.). The European Green Deal draws attention to how residual municipal waste must be reduced to its half to achieve circular economy by 2050 and how

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waste should be transformed into beneficial resources (The European Commission, 2020, p. 2). In the long term, waste will not occur due to circular economy, which entails that the waste and recycling industry of today will not continue to exist (Avfall Norge, 2016, p. 3).

The waste and recycling industry has primarily consisted of collecting and handling waste. The focus has been on landfill and energy utilization representing the lower two levels of the waste hierarchy (Avfall Norge, 2016, p. 6). The waste hierarchy states that resources aim to be treated as close as possible to the upper level and is a central principle of waste management in Norway and Europe (Avfall Norge, 2016, p. 6). The hierarchy consists of five levels, from the uppermost level: waste reduction, reuse, material recycling, energy utilization, and landfill (Avfall Norge, 2016, p. 6). As a shift towards circular economy, the industry changes from waste management towards resource management. Circular economy appears when higher levels of the hierarchy are achieved, and waste operates as a possibility to generate efficient use of resources (Tsai et al., 2020, p. 1).

Moreover, sustainable municipal solid waste management is a complex operation. To enable new objectives of the companies concerns different procedures, methods for monitoring, planning, and creation of accurate indicators (Tsai et al., 2020, p. 2). To achieve a sustainable practice, previous studies have drawn attention to the importance of internal management (Linnenluecke & Griffiths, 2010, p. 358). Furthermore, the focus on circular economy has increased in the previous years and is noticed as a new business model (Ghisellini et al., 2016, p. 12). However, there is limited research regarding circular economy at an organizational level. The corporate adoption of circular economy is a complicated task as it requires a new strategy, performance measurements, and a new aspect of what counts for value (Svensson & Funck, 2019, p. 390-391). Moreover, municipal solid waste management in a circular economy has been researched to a limited extent, and studies are lacking on the subject (Tsai et al., 2020, p. 2). The purpose of our research is to increase the understanding of circular economy on an organizational level and the use of control systems by managers regarding circular economy. Thereby, the following main research question, the purpose of our research, has been conducted:

How are management control systems used towards circular economy in Norwegian waste management companies?

## 1.3 Scope of the thesis and delimitations

The purpose of this research is to explore how management control systems are used towards circular economy in waste management companies. To answer the main research question as correctly as possible with the time constraint of the master thesis, we consider it necessary with certain delimitations.

Firstly, the research is delimited to the Norwegian market. Therefore, data is solely collected from actors who are geographically based in Norway. Furthermore, the research is delimited to companies within the waste management industry. As will be explained in chapter 2.5.1, waste management companies are defined as companies that manage waste through activities like collecting, sorting, and treatment. We will further delimit the research to publicly owned waste management companies.

Secondly, there are delimitations related to the choice of research methodology. This study is an exploratory research with a qualitative design as we want to accomplish an in-depth understanding of the case of waste management towards circular economy (Saunders et al., 2016, p. 174-175). We will explore this phenomenon as a multiple case study as this allows for comparisons and investigation of the phenomenon (Gustafsson, 2017, p. 3). The choices for the research method are further presented in chapter 3. Furthermore, the sample size of the research is delimited to five companies. The five companies have been carefully selected as representative companies, in line with the delimitations of the research. In the thesis, we have included companies with some variations of size. The companies are represented by two to three representatives. In total, we have 11 participants from the selected companies.

Finally, circular economy and sustainability are two concepts that can be challenging to distinguish since the two concepts have some common features and differences (Geissdoerfer et al., 2017, p. 785). In this research, we define circular economy as a contribution to sustainable development, which will be further interpreted in chapter 2.2.1.

## 1.4 Thesis structure

Furthermore, the thesis contains six chapters. The next chapter, chapter 2, includes the theoretical framework of the thesis, where the explanation of organizational incentive theory is the point of departure. Followed by a presentation of sustainability with an elaboration on

the principles of circular economy and theories that address the intersection between corporate governance and sustainability are accounted for. Additionally, an in-depth look at management control systems is presented, where two different management control systems are elaborated on before our choice of the control system is explained. The role management control systems have on sustainability is further presented in the chapter, followed by an elaboration on the case of waste management. Finally, five research questions have been formulated to answer the main research question, and the theoretical framework of the thesis is presented based on these research questions. Chapter 3 consists of the choices for the methodology for the thesis and presents the research philosophy, approach, and design of the study. Furthermore, the method of collecting and analyzing the data is explained, and the data quality is discussed based on reliability and validity. As a final element in this chapter, the ethics of the research are presented. In chapter 4, the results of the data collected are presented and divided in accordance with the theoretical framework based on the characters of the findings. As a result of the previous chapters, chapter 5 includes a discussion of the findings containing theoretical implications, practical implications, limitations, and proposals for future research. Last remaining chapter 6 consists of the conclusion of the main research question.

## 2. Theory

In this chapter, the theoretical framework for the research will be presented. As a point of departure, the organizational incentive theory is presented with the classic agency theory, the use of incentives in practice, and some limits in the use of incentives. The next part of the chapter is an explanation and presentation of definitions regarding sustainability will be given. Having the knowledge of sustainability clarified, the chapter further accounts for the aspect of circular economy regarding several definitions, what it contains, and the difference from sustainability. Furthermore, circular business models are elucidated. Additionally, management control systems are described, containing several definitions of the term and an in-depth explanation of two frameworks concerning management control systems. Then, the chosen management control system for the research and the reason for the choice will be accounted for. The chapter also describes the role of management control systems for sustainability and explains the case of waste management. Based on an analysis of theories, five research questions have been created. Finally, based on all the theories presented and the five research questions contrived, a theoretical framework has been drawn up and is presented at the end of the chapter.

### 2.1 Organizational incentive theory

A characterization of an organization is given by March and Simons (1993) as “[...] systems of coordinated actions among individuals and groups whose preferences, information, interests, or knowledge differ” (Quoted in Hendrikse, 2003, p. 7). Therefore, there are two topics followed from this characterization, which are interesting to study, co-ordination problems and motivation problems. Motivation problems are an essential element in designing incentives to avoid a conflict of interest (Hendrikse, 2003, p. 7). There exists a large amount of theoretical literature regarding how compensation contracts are designed to align the interest of the employees and the company. As a result of the literature, different components that motivate the actions of employees in line with the interest of their workers have been established (Prendergast, 1999, p. 7).

As a point of departure in this thesis, the organizational incentive theory will be elaborated on containing the principal agency theory, using incentives in practice and limits in the use of monetary incentives.

### **2.1.1 The principal agency theory**

The principal-agency relationship can occur at varying levels of the organization, for example between shareholders and top managers or leaders and employees (Kaplan & Atkinson, 2014, p. 677). Two problems can arise in an agency relationship, firstly a conflict of interest between the principal and the agency if the agent acts according to their interest and does not maximize the value of the company. The second problem involves demanding that the principal monitor the actions of the agents and whether the actions are correct (Eisenhardt, 1989, p. 58). This problem arises when there are differences in the risk preferences of the principal and the agent. Accordingly, the agency theory attempts to resolve these obstacles (Eisenhardt, 1989, p. 58). The simplest principal-agent relationship consists of two people in total, the principal hires an agent for a specific assignment. Their relationship is constrained by a contract, which the principal has designed, and the agent determines whether to signate, thereby validating the contract. The delegation of control and authority by the principal to the agent will often be necessary because of the greater understanding of the day-to-day business of the agent. Nevertheless, it could cause a conflict of interest problem if the agent acts according to their interests and does not maximize the value of the company. The self-interest of the agent may involve maximizing their financial results or career (Hendrikse, 2003, p. 90-91).

The principal is limited to only observing the result of the agent, and actions are hard-to-observe. Thereby, the principal cannot separate the result of the company from the hard work of the agent or coincidences in the circumstances. The agent has day-to-day business knowledge and hence is greater informed about the circumstances. Consequently, the agent has superior information, and a case of asymmetric information occurs (Hendrikse, 2003, p. 92-93). This can contribute to the agent taking advantage of the asymmetry of the information and engaging in unfavorable behavior to the principal. This is called moral hazard (Hendrikse, 2003, p. 95). Consequently, designing incentives that motivate agents to act in line with the interests of the principal is necessary (Hendrikse, 2003, p. 102).

Organizational management includes both coordination and motivation of individuals and groups. There can be a lack of motivation between the individuals and the organizational goals due to the self-interest behavior of individuals (Gibbons & Roberts, 2013, p. 56). An organization can affect the behavior of individuals in various paths, and different design aspects of the organization can be used to succeed. Three examples of elements that consist of organizational design and influence the behavior of individuals are culture, routines, and organizational architecture (Gibbons & Roberts, 2013, p. 56-57). The organizational design is therefore seen as a solution to the conflict of interest. Monetary incentives are used to obtain motivation, and the research regarding incentive theory has a principal-agent theory as a point of departure (Gibbons & Roberts, 2013, p. 58). In the next chapter, the classic agency model will be elaborated on and explained through mathematical expressions.

### **2.1.2 Gibbons (1998) – The classic agency model**

The classic agency model presented by Gibbons (1998) consists of an organizational model which shows how the trade-off between incentives and insurance results in different actions (p. 116). The model includes a principal and an agent, where the agent works on behalf of the principal. The principal thereby owns the output of the organization. A product function of an organization is given as a linear function (Gibbons, 1998, p. 116):

$$(1) y = a + \varepsilon$$

As the function tells, the output of the organization depends on the actions of the agent, noted as  $a$ , and  $\varepsilon$  represents the noise. The principal is unable to observe the behavior of the agent, and thereby it is not possible to reward the agent based on action,  $a$  (Gibbons, 1998, p. 116). Thereby the agent is rewarded based on a paying wage, given by the following function:

$$(2) w = s + by$$

Where the wage is noted as the constant,  $w$ , that represents the fixed salary, as well as the slope,  $b$ , a bonus dependent on the output. The central element of the model is the risk aversion of the agent. A higher bonus rate, therefore, leads to both higher incentives, but also a higher risk. The key element is therefore to balance the incentives and the risk, according to the risk aversion of the agent. The unobservable action of the agent,  $a$ , has a private cost for the agent, given by  $c(a)$ . A higher effort,  $a$ , will increase  $y$ . A higher risk will lead to higher private costs



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for the agent,  $c(a)$ , and the pay-off for the agent is given by the wage subtracted for the deficiency of action (Gibbons, 1998, p. 116):

$$(3) w - c(a)$$

The principals receive a pay-off, consisting of the output subtracted from the wage of the agent:

$$(4) y - w$$

The efficient bonus rate occurs between zero and one, where the latter provides no assurance for the risk-averse agent. A bonus rate equal to zero will, on the other hand, provide full assurance, but there will be a lack of initiative (Gibbons, 1998, p. 116).

The illustration of sharecropping enables a greater perspective of the risk in incentive contracting by analyzing the three different sharecropping contracts: wage labor, crop sharing, and a fixed payment (Gibbons, 1998, p. 116). With wage labor, no risk will be imposed on the agent, and  $b$  equals 0. Crop sharing denotes a distributed risk between agent and principal where  $0 < b < 1$ . Accordingly, all risk is allotted to the agent with fixed payments,  $b = 1$ . The analysis demonstrates that payments where the risk is distributed, such as fixed wages and crop sharing, are more frequent in countries with higher risk (Gibbons, 1998, p. 116). There is an extensive variation within the three main payment contracts. The findings also show a significant variation in how the contract is used, despite controlling for risk. The suggestion is, “The tradeoff between incentives and insurance has some explanatory power, but a great deal is hiding in the unexplained variation” (Gibbons, 1998, p. 117).

### ***Objective performance measurements***

Furthermore, organizations often get what they are paying for, and three models that present this will further be accounted for. These three models contribute to the classic agency model by discarding the assumption that the output,  $y$ , is easily measured, which is a limitation of the principal-agent model (Gibbons, 1998, p. 118). Since the principal-agent model does not take into consideration the complexity of measuring the output, it denotes  $(y)$  as all the principal cares about (if the pay-off of the principal is  $y - w$ ). In this theory, the  $(y)$  will be denoted as “the total contribution to the firm” instead of output. The reason for this is to accentuate that it comprises all the actions of the agent, along with all the effects of these actions (Gibbons,

1998, p. 118). The denotation of “total contribution to the firm” is more correct, however, it does not represent the reality in organizations. However, as the pay-off of the agent is to a greater extent depending on the wage ( $w$ ), which then again is dependent on the “total contribution to the firm” ( $y$ ), it could be problematical. Therefore, an alternative performance measurement,  $p$ , is assumed, which results in the following wage contract (Gibbons, 1998, p. 118):

$$(5) w = s + bp$$

To illustrate one of the main themes of the first model by Baker (1992), it is assumed that the agent can perform two kinds of actions,  $a_1$  and  $a_2$  (Quoted in Gibbons, 1998, p. 118). Thereby, the contract in equation (5) creates incentives that are dependent on the bonus rate ( $b$ ), and how the actions  $a_1$  and  $a_2$  influence the performance rate ( $p$ ). However, Baker (1992) claims that the “[...] marginal social benefits of the agent’s actions depend on how  $a_1$  and  $a_2$  affect the agent’s total contribution to firm value,  $y$ ” (Quoted in Gibbons, 1998, p. 118). Further on, Baker (1992) argues, “To induce the agent to choose first-best actions, a contract must create incentives that match the marginal social benefits” (Quoted in Gibbons, 1998, p. 118). This is, however, claimed to be almost impossible in practice and to illustrate this, the example is given there the sum of  $a_1$  and  $a_2$  is supposed to be ( $p$ ), but ( $y$ ) is the sum of  $a_1$  and twice  $a_2$  (Gibbons, 1998, p. 118). Baker (1992) then argues that “In a broad class of such examples, no contract can cause the agent’s incentives to match the marginal social benefits of the agent’s actions” (Quoted in Gibbons, 1998, p. 118).

The next model illustrates that organizations get what they pay for and is presented by Lazear (1989), which emphasizes “weak incentives may be more efficient than strong but dysfunctional incentives” (Quoted in Gibbons, 1998, p. 118). From this tournament model, there are only two actions of the agent that are allowed, which are effort and sabotage. It is argued that a greater prize for winning the tournament encourages not only the effort of the agents but also actions towards sabotaging. Therefore, is the efficient level of the prize reduced if sabotage is a possibility rather than if the effort is the only possible action for the agent to win the tournament (Gibbons, 1998, p. 118).

The last remaining model, Holmström and Milgrom (1991), creates several models where the “multitask” spirit is taken into consideration (Quoted in Gibbons, 1998, p. 119). In some of these models, the measured performance is taken into consideration, and reject the dimension

of “total contribution”. For instance, in a case where action a1 is a part of the contribution, not only (p) but also (y) (Gibbons, 1998, p. 119). Further, if action a2 contributes to (y) and not towards (p), a contract connected to such measured performance motivates the agent to ignore action a2. This because the agent will receive less wage, despite action a2 are, increasing the total contribution of the agent towards the value of the company (Gibbons, 1998, p. 119). Based on all this, the idea is that the measured performance is different from the total contribution.

### **2.1.3 Incentives in practice**

The economic models of compensation and reward assume that higher performance demands higher effort, and the incentives in these models are designed so that the expected utility of employees increases with the observed output. These incentives can be praise from managers, promotion, increased self-esteem, or monetary incentives (Baker et al., 1988, p. 594). Despite the knowledge of possible non-monetary incentives effects, the economist focus has primarily been related to monetary incentives. According to Baker et al. (1988), companies often claim that pay and performance are closely linked (p. 595). However, given the result of previous research, a limited link between payment and performance is found. This indicates that companies are not doing a good job tying the two elements together (Baker et al., 1988, p. 595).

Three possible explanations have been presented for why companies link payment to performance to a small extent. The first explanation is that rewarding encourages people to take a limited view of tasks by doing them as quickly as possible without taking any risks (Baker et al., 1988, p. 596). The second point is that external motivation can displace internal motivation. The last point considers that employees may feel controlled by the reward.

Furthermore, it is argued that monetary incentives come with significant negative side effects which affect the morale and productivity of the employees. The behavioral literature claims that companies treating their employees differently harms the morale of the employees (Baker et al., 1988, p. 596). Regarding pay-for-performance measurements, they can be based on measures that are objective, subjective, or a combination of these two. Objective measurements have some limitations, such as sacrificing the quality to increase the quantity. However, it will be hard for the principal to create objective measures related to the effort of the agent (Baker et al., 1988, p. 598).

The alternative is to develop subjective measurements of performance; however, Baker et al. (1988) emphasize that there are also limitations with such measurements. (p. 598). Subjective performance rely on a high level of trust between the principal and the agent because otherwise, the agent will not believe the pay is fairly distributed based on performance. Using biased and inaccurate performance to evaluate the employees reduces their productivity by the incentives losing their effect. If the manager makes incorrect performance decisions, it would be optimal to introduce more accurate measures by increasing the cost so decisions become more precise (Baker et al., 1988, p. 608).

#### **2.1.4 Limits in the use of external incentives**

Despite the previously presented theory that incentives influence behavior is well grounded in theory and corresponds to reality several times, there are cases where theory and reality do not coincide. In the following paragraphs, an account will be given of when external incentives may conflict with other forms of motivation or reduce internal motivation (Gneezy et al., 2011, p. 191).

Monetary incentives can, according to Gneezy et al. (2011), have two effects, firstly, they can direct the price effect, which entails that the behavior being incentivized is more attractive (p. 192). Secondly, monetary incentives can have an indirect effect on psychology. The latter includes that employees can have a utility function, including several components. Bénabou and Tirole (2006) use the example of a utility function, which consists of extrinsic reward, appreciation of doing an activity, and being concerned about their image (p. 1654). This illustrates how several components influence the effort of the agent. Furthermore, by the principal providing a monetary incentive might give some signals to the agent. For instance, providing incentives might signal that the principal has doubt and mistrust of the agents, which leads to a reduction in intrinsic motivation (Gneezy et al., 2011, p. 192). An additional channel that might crowd out the intrinsic motivation of the agent is related to if the extrinsic rewards cause a reduction in their reputation. Thereby, using extrinsic rewards will have a negative contribution if the effect on the image is stronger than the utility function (Gneezy et al., 2011, p. 193).

There is a greater amount of previous research on incentives, and commonly it has emerged that incentives contain information from the principal to the agent, which could provoke unexpected behavioral effects (Gneezy et al., 2011, p. 193). This as the agents will develop an

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opinion both because of the existence as well as the size of the incentive. Therefore, as stated earlier, the incentives affect their impression of the relevant task and could thereby decrease their motivation. This may result in a permanent loss of motivation for the task without an incentive (Gneezy et al., 2011, p. 194).

Furthermore, providing incentives for prosocial behavior is related to voluntary actions for public goods. Some of the past research might argue that extrinsic incentives do not increase the actions for public goods but instead crowd out these actions (Gneezy et al., 2011, p. 199). In the aspect of prosocial behavior, trust is an essential element. Therefore, the efficiency of an incentive relates to if it strengthens the contributions to the public good. Further, it is depended on if the incentive affects the level of trust in the relationship between the involved ones (Gneezy et al., 2011, p. 200). If the incentives decrease the level of trust, the incentive might be ineffective in increasing the contributions to public goods. Another motivation for contribution to social goods is the impact it might have on the reputation and image, by providing extrinsic rewards can crowd out this motivation. This is because the presence of an extrinsic reward creates uncertainty for others about if the actions are from the person “doing good” or from the extrinsic reward (Bénabou & Tirole, 2006; Gneezy et al., 2011).

## 2.2 Sustainability

Previously, in chapter 1.1, the definition of sustainable development by the UN was accounted for. In 1992, at the Earth Summit in Rio de Janeiro, there was a common acceptance of this definition (Linnenluecke & Griffiths, 2010, p. 358). Despite the agreed-upon definition, is this not the only definition of sustainability. According to the research of Johnston et al. (2007), there are over 300 definitions of sustainability (p. 60). The definitions have evolved, and according to the dictionaries, the definition follows as “able to be maintained at a certain rate or level” (Dictionary, 2010, quoted in Geissdoerfer et al., 2017, p. 758). Furthermore, the definition was extended towards a holistic perspective, such as “[...] sustainability demands ways of living, working and being that enable all people of the world to lead healthy, fulfilling, and economically secure lives without destroying the environment and without endangering the future welfare of people and the planet” (Johnston et al., 2007, p. 62). The definition of Geissdoerfer et al. (2017) on sustainability differs from others in some respects, “[...] as the balanced integration of economic performance, social inclusiveness, and environmental resilience, to the benefit of current and future generations” (p. 766).

Particularly relevant to the concept of sustainable development is the three-part bottom line, consisting of people, profit, and the planet. These three pillars work ‘as interdependent and mutually reinforcing pillars’ (Geissdoerfer et al., 2017, p. 759). This has challenged organizations to simultaneously create social improvements, reduce negative environmental impact, and effectively achieve the overall goals of the organization (Linnenluecke & Griffiths, 2010, p. 358). Sustainability has been incorporated into the agendas, objectives, and strategies of organizations (Geissdoerfer et al., 2017, p. 759). Sustainable development seems to be as enduring as democracy, justice, and freedom (Geissdoerfer et al., 2017, p. 759). To succeed with sustainability issues, circular economy has received increased attention as a possible solution from companies and policymakers (Geissdoerfer et al., 2017, p. 758).

### **2.2.1 Circular economy**

There has been an increasing interest in circular economy worldwide, which contradicts the previously dominating linear economy, which consists of a take, make, and dispose model (Ghisellini et al., 2016; Govindan & Hasanagic, 2018; Stahel, 2016). The resource limitation of the planet is the point of departure for the rising interest of circular economy as the linear economy pressures the boundaries of the earth (Jørgensen & Pedersen, 2018; Lüdeke-Freund et al., 2019; Tsai et al., 2020). Consequently, circular economy has received increasing recognition in the research literature (Geissdoerfer et al., 2017, p. 759). Moreover, the literature presents multiple definitions of circular economy. For instance, a definition conducted by Geissdoerfer et al. (2017):

[...] the circular economy as a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling (p. 766).

The Ellen MacArthur Foundation (2015) argues that the term circular economy is characterized rather than defined as “[...] an economy that is restorative and regenerative by design and aims to keep products, components, and materials at their highest utility and value at all times, distinguishing between technical and biological cycles” (p. 5). Followingly the European Union (EU) define it as “In a circular economy, the value of products, materials, and resources is maintained in the economy for as long as possible, and the generation of waste is minimized” (The European Commission, n.d.). There are several objectives of circular

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economy, for example, reducing the use of natural resources, reducing the amount of waste, and diminishing gas emissions by moving towards sustainable and renewable energy (Govindan & Hasanagic, 2018, p. 281). An essential element is that circular economy is not a final goal, but something continuously worked on to efficiently handle resources (Lüdeke-Freund et al., 2019, p. 37).

The roots of circular economy originate from industrial ecology, which entails rebuilding industrial systems obedient to the ecosystem (Preston, 2012, p. 2). Industrial ecology developed in contrast to the view that environmental impacts resulting from the industrial system should be assessed by separating the source and receptors of the effect. Thereby, industrial ecology is presented, considering both the source and the receptor as a shared ecosystem (Ghisellini et al., 2016, p. 15). Industrial ecology can be defined as:

The traditional model of industrial activity—in which individual manufacturing processes take in raw materials and generate products to be sold, plus waste to be disposed of—should be transformed into a more integrated model: an industrial ecosystem. The industrial ecosystem would function as an analog of biological ecosystems. (Frosch and Gallopoulos, 1989, quoted in Lüdeke-Freund et al., 2019, p. 37).

According to this definition, it refers to a theory in which industrial systems are not seen in isolation but rather in coordination with one another. Industrial ecology aims to maximize the entire materials cycle, from raw materials to components, produced goods, waste goods, and finally to disposal (Saidani et al., 2020, p. 3). Therefore, industrial ecology is central to guidelines for sustainable development in companies, as closing the material loops is promoted by industrial ecology (Ghisellini et al., 2016, p. 14).

### ***The differences and similarities of sustainability and circular economy***

As previously noted, the two terminologies, circular economy and sustainability, consist of different definitions. Circular economy and sustainability can be challenging to distinguish from each other. Moreover, the two concepts have some common features (Geissdoerfer et al., 2017, p. 758). For instance, both concepts depend on regulations as a core of implementation, and design and innovation are seen as the main driver of both circular economy and sustainability. Thereby, business model innovation is the key to transformation in the two terminologies (Geissdoerfer et al., 2017, p. 762-764). However, there are also some differences between the two concepts. For instance, the distinction of different goals related

to the two terms. Circular economy aims towards a closed loop that eliminates waste creation and new resource inputs (Geissdoerfer et al., 2017, p. 764). On the other hand, sustainability consists of multiple, open-ended goals, which can vary according to the interests of the different agents (Geissdoerfer et al., 2017, p. 764).

The literature is nevertheless divided regarding whether sustainability and circular economy are to be regarded as different concepts. According to the research of Geissdoerfer et al. (2017), several studies claim that circular economy is a part of sustainability and sustainable development (p. 764). Bocken et al. (2014) present circular economy as one of the business model archetypes for sustainability (p. 42). Consequently, circular economy is a possible mechanism and solution to achieve sustainability (Bocken et al., 2014; Ghisellini et al., 2016). Additionally, Ghisellini et al. (2016) argue that sustainable development obligates simultaneous attention and integration of the three elements, environment, economy, and society, where circular economy has positive effects regarding all three aspects (p. 12). Circular economy is a new business model that contributes positively to sustainable development (Ghisellini et al., 2016, p. 12).

### *What circular economy entails*

The literature gathers around three concepts that comprise circular economy: reduction, reuse, and recycle, referred to as the 3Rs (Bocken et al., 2016; Ghisellini et al., 2016; Stahel, 1982). The key is to preserve materials and resources at the highest possible quality. Thereby, materials can be repeatedly used, and materials “upcycled” rather than “downcycled” through being recycled (Jørgensen & Pedersen, 2018, p. 106). Downcycling refers to the quality of materials decreasing, and eventually becoming useless (Jørgensen & Pedersen, 2018, p. 106). Therefore, recycling is seen as downcycling of resources because it leads to a reduced quality of the material over time (Braungart & McDonough, 2009, p. 56). Stahel (1982) refers to circular economy as a “slow replacement system” which extends the lifetime of products, and “the self-replenishing system” creates an economy based on a system like a spiral where it is about minimizing the loop (p. 74). Circular economy reduces the need for new virgin resources by further reusing existing resources, and this is made possible by rethinking how products will operate in a closed loop (Govindan & Hasanagic, 2018, p. 279). To better understand what circular economy entails, the 3Rs are further described.

Reduction refers to reducing the input resources, energy, and waste in eco-efficiency also presented as production (Ghisellini et al., 2016; Lüdeke-Freund et al., 2019). This can be done



in various ways, for example, by better technologies, reduced packaging, increased efficiency in householding equipment, or a simpler lifestyle. To increase eco-efficiency in production, the quality of the products must be contained, and the environmental footprint reduced. This can be done by decreasing the resources per unit of output and substituting environmentally harmful material with environmentally friendly material used per unit (Ghisellini et al., 2016, p. 15). Reuse involves any operation where products that are not wasted are used again with a purpose similar to the original (Ghisellini et al., 2016; Lüdeke-Freund et al., 2019). Recycling can be defined as a recovery process where waste is reshaped into new products or materials. This includes organic materials; however, it does not consist of recovery of energy nor materials used further as fuels or in backfilling operations. Recycling enables taking advantage of resources that otherwise would have been destroyed (Ghisellini et al., 2016, p. 16). Nevertheless, it is worth mentioning that although recycling often is associated with circular economy, this might be one of the least sustainable solutions since it causes downcycling of resources (Ghisellini et al., 2016; Lüdeke-Freund et al., 2019).

By the definition of circular economy, Bocken et al. (2016) presents slowing, closing, and narrowing the loop, rather than the 3Rs (p. 309). Slowing down the loop through the design of products with an extended lifespan, thereby, there is a reduction in the necessary resources needed. The loop can be closed using, for example, recycling, so post-used products are recycled to achieve circularity. Narrowing the loop, on the other hand, involves using less products per product (Bocken et al., 2016, p. 309).

Contrastingly, Lüdeke-Freund et al. (2019) present circular economy through a framework consisting of reverse cycles existing of six cycles, which can be combined as well (p. 40). Starting with repair & maintenance, reuse & redistribute, refurbishment & remanufacturing, recycling, cascading & repurposing biochemical feedstock extraction (Lüdeke-Freund et al., 2019, p. 40). All six cycles can be the foundation and translated into sustainable business models (Lüdeke-Freund et al., 2019, p. 40). In recent years the expansion from 3Rs to 6Rs has become more common as sustainable innovation has gained increasing interest (Govindan & Hasanagic, 2018, p. 281). Ranjbari et al. (2021) even point out a 10R strategy and emphasize how several authors highlight waste management as important to make the strategies possible (p. 2).

## 2.3 Circular business model

There are several different definitions of a business model. Magretta (2002), describes a business model as the story of the company and of how it operates (p. 4). Another well-known definition is given by Osterwalder and Pigneur (2010) who describe business models as the reasoning of how an organization creates, captures, and delivers value (p. 14). Similarly, Jørgensen and Pedersen (2018) define the business model as the value creation, value delivery, and value capture of the company (p. 59).

Suppose the operation of a company has negative consequences on the environment and society and, thereby, is a part of the sustainability problem. In that case, it results from what is denoted as negative externalities (Jørgensen & Pedersen, 2018, p. 28). By the operations of companies contributing towards solutions and taking responsibility for the negative impact of others on the sustainability problem, positive externalities arise (Jørgensen & Pedersen, 2018, p. 31). Every business model creates externalities; hence they have both positive and negative side effects (Gulbrandsen et al., 2015, p. 14). The obstacle of the sustainability problems today originated from the negative consequences of the operations of companies are greater than the positive effects (Jørgensen & Pedersen, 2018, p. 35). Hence, the business model of the company is sustainable if the positive side effects are more significant than the negative (Braungart & McDonough, 2009, p. 165). To enable a sustainable future, companies should attempt to harmonize the interaction between companies, society, and the environment (Jørgensen & Pedersen, 2018, p. 35). Corporate sustainability can be defined as “The strive for sustainable improvements of ecological and social impacts of companies in line with planetary boundaries and societal goals like the UN Sustainable Development Goals by integrating social, ecological and economic perspectives in management” (Crutzen et al., 2017, p. 1291). The difficulty is designing business models in harmony with the three elements (Jørgensen & Pedersen, 2018, p. 36). The bottom line becomes three-dimensional, and to succeed with the three-dimensional performance, it is a prerequisite that the organizational design encourages it (Gond et al., 2012; Gulbrandsen et al., 2015).

The complexity of business operations increases when sustainable business models are introduced since the performance along multidimensional phenomena must be incorporated into the business model design (Gulbrandsen et al., 2015, p. 15). An important aspect is, therefore, to create objectives in line with all three dimensions, that direct the behavior of employees (Jørgensen & Pedersen, 2018, p. 160). Accordingly, there are four essential

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elements for achieving a simultaneous performance along the three-dimensional bottom line, consisting of organizational structure, management control systems, incentives, and contact with stakeholders (Jørgensen & Pedersen, 2018, p. 158-161). Furthermore, a decisive part of incorporating a sustainable business model is organizing a management control system that measures the performance and manages the behavior towards the objectives of the companies across all dimensions (Gulbrandsen et al., 2015, p. 16).

The aspect of sustainable business models as stated in the paragraphs above is assumed by previous authors, to be consistent with circular business models (Geissdoerfer et al., 2020, p. 7). Furthermore, there exist multiple definitions of circular business models, where one of them is the definition of Geissdoerfer et al (2018) which claims that circular business models can be defined as sustainable business models (Quoted in Geissdoerfer et al., 2020, p. 6). Several of the definitions additionally consider how organizations create, capture, and deliver value. Therefore, innovation of business models is linked to circular business models (Bocken et al., 2016; Geissdoerfer et al., 2020).

To achieve sustainability, innovative solutions are crucial (Nidumolu et al., 2009, p. 12). Innovation of business models consists of companies changing how value is created, delivered, and captured (Jørgensen & Pedersen, 2018, p. 68). Respectively, innovation does not just consist of changing the value proposition for customers but involves changing the way business is done (Bocken et al., 2014, p. 44). The innovation can be radical where the business model changes to a large extent or an incremental innovation consisting of small changes (Jørgensen & Pedersen, 2018, p. 69). Innovation for sustainable business models is defined as “Innovations that create significant positive and/or significantly reduced negative impacts for the environment and/or society, through changes in the way the organization and its value-network [...]” (Bocken et al., 2014, p. 44). Innovation and sustainability are therefore closely linked (Nidumolu et al., 2009, p. 12).

Moving towards circular economy is considered to be a radical change as it will cause a necessary change in mindset and a new way of doing business (Bocken et al., 2016, p. 312). Bocken et al. (2014) present different groups of possible business model innovations and their contribution towards sustainability, where circular economy appears as one of the business models (p. 48). The business model of circular economy underlies the category of “creating value from ‘waste’ ”, which further is described as changing the waste streams of today into a valuable input resource for other products, thereby eliminating waste (Bocken et al., 2014, p.

49). According to the Ellen MacArthur Foundation (2015), waste is “designed out” in circular economy, and thereby, waste does not exist (p. 7). The archetype “creating value from waste” is formed on improving the environmental footprint by reducing the resource demand by closing material loops. Hence, using waste as an input for new raw materials leads to a reduced amount of waste created (Bocken et al., 2014, p. 49). There are several drivers for circular economy incorporated in business, and one of them is the new policies and laws according to waste management (Govindan & Hasanagic, 2018, p. 301).

## 2.4 Management control systems

For organizations to accomplish their objectives, control is a process to manage and regulate the activities in the organization (Otley & Berry, 1980, p. 233). Otley and Berry (1980) explain that “[...] control processes are a fundamental part of organisational activity” (p. 232). The aim of management control is to manage the organization towards organizational goals and corporate strategy (Svensson & Funck, 2019, p. 390). Svensson and Funck (2019) define management control as “The process of steering organizations through the environment in which they operate in order to achieve their goals” (p. 390-391).

Management control systems are defined and described in various ways in the earlier research literature (Malmi & Brown, 2008, p. 288). Malmi and Brown (2008) point out that some of the definitions differentiate from each other, while others overlap (p. 289). The various definitions have evolved from focusing on the formal financial quantifiable information to include a broader scope of external non-financial information (Chenhall, 2003, p. 129). An early definition given by Anthony (1965) describes management control systems as “[...] the processes by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization’s objectives” (p. 17). This definition is considered relatively narrow and focuses on formal control without including a holistic view of management systems (Ferreira & Otley, 2009, p. 264).

A broader definition given by Malmi and Brown (2008) defines management control as “Those systems, rules, practices, values and other activities management put in place to direct employee behavior should be called management controls” (p. 290). Based on this definition Malmi and Brown (2008) describe management control systems as “If these [management controls] are complete systems, as opposed to a simple rule [...], then they should be called MCSs [management control systems]” (p. 290). Simons (1995) defines management control

systems as “[...] the formal, information-based routines and procedures managers use to maintain or alter patterns in organizational activities” (p. 5). The definition includes only formal and information-based routines. The definition of Malmi and Brown (2008) conforms to the definition of Simons (1995), but the definition of Simons is narrower (p. 290). Malmi and Brown (2008) also include informal and formal routines, accounting, and non-accounting controls (Ghosh et al., 2019, p. 8).

According to Strauß and Zecher (2013) there exist multiple different management control systems, which vary in their content (p. 234). Strauß and Zecher (2013) include several of the most recent frameworks in their review, consisting of Malmi and Brown (2008), Ferreira and Otley (2009), Merchant and Van der Stede (2007), and Simons (1995), among several others. With limited resources, it has been necessary to make a selection of the literature and framework that is examined, assessed, and presented in this research. Regardless of the investigation and assessment of other frameworks, only two will be presented further, as these are considered the most relevant for the purpose of the thesis. In this thesis the frameworks of Simons (1995) and Malmi and Brown (2008) will be presented before a justification for the choice of the theoretical framework will take place.

Simons (1995) announces a theoretical framework consisting of three levels for implementing and controlling business strategies (p. 3-7). The framework will be further elaborated in chapter 2.4.1. Malmi and Brown (2008) introduce a conceptual typology of management control systems as a package consisting of five types of controls (p. 291). The typology of Malmi and Brown (2008) is further presented in chapter 2.4.2.

### **2.4.1 Simons (1995) – Levers of control**

Simons (1995) introduces his framework because of the deficit understanding of strategy implementation and control (p. 3). If the managers are not familiar with the tools and techniques of strategy implementation, the strategy will be considered unnecessary (Simons, 1995, p. 3). The framework has a business strategy at its core and consists of two additional levels. However, the framework does not include the preparation of the strategy, but how the management control systems are applied after the strategy is decided (Simons, 1995, p. 3).

The second level of the framework consists of four different constructions to successfully implement a strategy, comprising core value, the risk to be avoided, critical performance variables, and strategic uncertainties (Simons, 1995, p. 6). The third level, called levers, deals

with the various systems that control the constructions presented in level two. Managers use the levers to transfer and process information in the organization (Simons, 1995, p. 5). The use of the various levers has different implications. The four critical levers are presented as opposite forces subsisting of two inspirational and two constraint forces. The levers are belief systems, interactive control systems, boundary systems, and diagnostic control systems, where the two latter consists of the constraint forces and the former two are inspirational forces (Simons, 1995, p. 6-7). Followingly, the four levers will be further explained, where managers aim to balance the four levers of control (Simons, 1995, p. 10).

The first lever, belief systems, is organizational definitions that managers formally express and repeatedly reinforce to give the core values, direction, and purpose of the organizations. These guiding principles are connected to the corporate strategy of the company (Simons, 1995, p. 34). The primary goal of a belief system is to motivate and direct corporate searches and discoveries. The belief system is conveyed formally in mission statements, credos, or statements of purpose (Simons, 1995, p. 34-36). According to Simons (1995), employees must understand the organizational goal (p. 37). Thus, this aligns with the behavior and corporate interest of the individuals (Simons, 1995, p. 37).

Boundary systems are the second control lever and consist of setting boundaries to seek opportunities based on known business risks (Simons, 1995, p. 40). The boundary system determines the accepted domain of activity of the employees and establishes clear boundaries to reduce the risk of the company (Simons, 1995, p. 39). Thereby, the employees have clear limitations on behavior, which entails the individuals creating value within limits. Setting boundaries enables the organization to accomplish creativity and flexibility (Simons, 1995, p. 41). The borders can be established through formal rules, limits, and prohibitions connected to clear sanctions and genuine threats of penalties (Simons, 1995, p. 178).

Managers utilize formal information systems called diagnostic control systems to track organizational results and address deviations from current performance standards. The third lever consists of diagnostic control systems, which ensure specific objective achievements and can be divided into three features: measure the output, predetermined standards, and ability to correct (Simons, 1995, p. 59). The system includes financial and non-financial measures, but budgets and profit plans are the most comprehensive diagnostic control system (Simons, 1995, p. 61).

The fourth lever consists of interactive control systems, which is the opposite of diagnostic control systems. This lever encourages search and learning, which allows new strategies to appear (Simons, 1995, p. 91). Firms must go beyond their usual search parameters to adapt successfully in competitive markets. At all levels, it is essential to support novel concepts and experimentation. To monitor and report societal changes, senior managers must encourage ongoing search activity and establish information networks within the organization (Simons, 1995, p. 92).

All four are aligned to make up the levers of control conducted by Simons (1995), and the tensions must be balanced. To balance the pressures, managers must understand how to use the systems effectively (Simons, 1995, p. 4-5).

#### **2.4.2 Malmi & Brown (2008) – Management control systems as a package**

Malmi and Brown (2008) introduce their typology of management control systems as a package for managers to influence employee behavior to comply with the overall objectives and strategies of the organization. Management control systems include formal and informal systems (Malmi & Brown, 2008, p. 295). The framework includes five types of controls: planning, cybernetic, reward and compensation, administrative, and cultural (Malmi & Brown, 2008, p. 291). Further, each of the controls will be presented.

Malmi and Brown (2008) discuss planning as a form of control exercised through three courses of action, which is through determining the goals of the organization and standards to accomplish, and thirdly, enabling coordination of actions throughout the organization (p. 291). Malmi and Brown (2008) distinguish between two approaches: action planning and long-range planning. Action planning is when goals and actions have a short time range and a tactical focus. Long-range planning has a medium- and long-term range and a more strategic focus (Malmi & Brown, 2008, p. 291).

Green and Welsh (1988) define cybernetic controls as “[...] a process in which a feedback loop is represented by using standards of performance, measuring system performance, comparing the system’s comporment” (p. 289). In the framework of Malmi and Brown (2008), the cybernetic systems included budgets, financial, and non-financial measures, and hybrids (p. 292). These systems are used for information and decision-support to change unwanted variances in behavior (Malmi & Brown, 2008, p. 292). Firstly, budgeting serves as

a control mechanism to plan acceptable levels of behavior and further evaluate performance in opposition to these plans. Whilst financial measures are specific measures used to hold employees accountable for their behavior, such as return on investment and economic value added. Furthermore, non-financial measures are complementary to financial measures and are used to identify performance drivers. While finally, hybrid performance measurement systems include financial and non-financial measures (Malmi & Brown, 2008, p. 293).

Reward and compensation controls motivate and increase the performance of individuals and groups in the organization by creating overlapping interests between goals and actions (Malmi & Brown, 2008, p. 293). Bonner and Sprinkle (2002) argue that this form of control can increase effort and performance by linking effort to the task in three ways: direction, duration, and intensity (p. 304). Effort direction is the assignment the individuals focus on, and effort duration concerns how much time each person spends on the assignment. Lastly, effort intensity is about how much attention the individuals dedicated to the assignment (Bonner & Sprinkle, 2002, p. 304).

Administrative control functions as a control system by directing the behavior of the employees through the organization, examination of behavior, and description of the achievement of assignments (Malmi & Brown, 2008, p. 293). Malmi and Brown (2008) refer to three different administrative controls, organization design and structure, governance structure within the firm, and procedures and policies (p. 293). The purpose of the design and structure of the organization is to act as controls to reduce the variation of behavior through functional specialization (Malmi & Brown, 2008, p. 293). The governance structure includes the formal lines of authority and accountability and is there to influence behavior. Policies and procedures are in place to specify how activities and behavior should or should not be performed (Malmi & Brown, 2008, p. 294).

Flamholtz (1983) defines organizational culture as “[...] the set of values, beliefs and social norms which tend to be shared by its members and, in turn, tend to influence their thoughts and actions” (p. 158). Malmi and Brown (2008) refer to three aspects of cultural controls: value-based, symbol-based, and clan control (p. 294). Simons (1995) defines value-based control through his definition of the belief system: “[...] the explicit set of organizational definitions that senior managers communicate formally and reinforce systematically to provide basic values, purpose, and direction for the organization” (p. 34). Furthermore, symbol-based control are visible statements of the organizational culture which influence



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employee behavior (Malmi & Brown, 2008, p. 194). Finally, Malmi and Brown (2008) describe clan control as subcultures within the organization with common values and skills (p. 294-295).

### **2.4.3 The decision of management control systems approach**

The two frameworks presented consist of several similarities. Malmi and Brown (2008) even have some control systems derived from the levers of control by Simons (1995, p. 293-294). Both frameworks assume that the management control systems affect the members of an organization (Strauß & Zecher, 2013, p. 264). Even though the framework of Simons (1995) could have been used to provide insight into the main research question, the framework of Malmi and Brown (2008) is chosen as the holistic focus is considered an advantage that makes it appropriate for the purpose of the research. The overall foundation of the framework also reduces the threats of model under-specification (Lueg & Radlach, 2016, p. 160). By using the framework of Malmi and Brown (2008), it enables to study the application of management control systems across hierarchical levels in the organization (Lueg & Radlach, 2016, p. 160).

Ditillo and Lisi (2014) recommend the framework of Malmi and Brown (2008) in research on sustainability control systems to ensure a holistic perspective (p. 26). Although the thesis does not address sustainability directly, circular economy is defined as a mechanism for achieving sustainability. The framework ensures a comprehensive understanding of management control systems for sustainability in practice (Ditillo & Lisi, 2014; Lueg & Radlach, 2016).

## **2.5 Sustainability management control**

Ditillo and Lisi (2014) state that there has been hardly any attention to the role of management control systems in the sustainability of organizations (p. 25). The growing interest in corporate sustainability and circular economy has driven a new stream of research literature focused on management control systems for sustainability (Crutzen et al., 2017; Svensson & Funck, 2019). Crutzen et al. (2017) state that recent research literature argues that management control systems are central for organizations to become more sustainable (p. 1293). Management control systems are essential for organizations to integrate and enforce sustainable development, and sustainability management control can help organizations to embrace sustainability as a strategic goal (Ditillo & Lisi, 2014; Lueg & Radlach, 2016).

Maas et al. (2016) state that how organizations can integrate management control systems for sustainability has been researched to a minimal extent (p. 237), the statement is also supported by Arjaliès and Mundy (2013, p. 284). In a Norwegian context, there is limited research on management control systems (Johanson & Madsen, 2013, p. 18). Johanson and Madsen (2013) contribute to the research literature by exploring the framework of Malmi and Brown (2008) in a Norwegian context, but their research does not include a focus on sustainability (p. 19).

Durden (2008) states that several pieces of research literature argue that management control systems are essential for sustainable practices in an organization (p. 671). Riccaboni and Leone (2010), Norris & O'Dwyer (2004), and Morsing and Oswald (2009) are examples of research literature that study parts of a management control system for sustainability. The latter discusses that organizational culture is an important factor to affect sustainability at the operational level (Morsing & Oswald, 2009, p. 83). Riccaboni and Leone (2010) find that traditional planning and monitoring systems, in a combination of both formal and informal controls, are important for the implementation of a successful strategy for sustainability (p. 130). Norris and O'Dwyer (2004) present a case study exploring the extent to which formal and informal control systems influence socially responsive managerial decision-making (p. 173). They find that informal controls such as social and self-control have a dominant influence on decision-making among managers. Despite the tensions between the informal and formal control systems, the dominant influence of informal controls is persistent (Norris & O'Dwyer, 2004, p. 173).

In earlier research literature, the concept of sustainability management control has been sporadically discussed (Crutzen et al., 2017, p. 1293). Crutzen et al. (2017) are the first to give a holistic approach to sustainability management control and define it as “[...] all devices and systems that managers develop and use to formally and informally ensure that the behaviors and decision of their employees are consistent with the organization’s sustainability objectives and strategies” (p. 1293). In their study, they identify that organizations can approach management control systems for sustainability either with a formal or informal focus (Crutzen et al., 2017, p. 1293). Formal controls are, for example, accounting-based controls, informal controls, on the other hand, are more unwritten rules, values, and organizational beliefs (Crutzen et al., 2017, p. 1292). In our thesis, Crutzen et al. (2017) will form the basis of our understanding of sustainability management control together with the broader definition of management control from Malmi and Brown (2008).

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Most of the previous research has focus on circular economy at the societal level and in the environmental sciences (Svensson & Funck, 2019, p. 396). Therefore, the practice of implementing circular economy in organizations has remained under-researched (Crutzen et al., 2017; Svensson & Funck, 2019). Svensson and Funck (2019) have studied how circular economy is integrated into an organization and how the business model affects management control by using the framework of Malmi and Brown (2008) (Svensson & Funck, 2019, p. 390). They find that circular economy affects all parts of the management control systems framework and is practiced in different ways (Svensson & Funck, 2019, p. 396).

A great amount of research has been done on the topic of management control as single standards that are isolated from each other (Malmi & Brown, 2008, p. 287), and there has been diminishing focus on the holistic approach to management control systems (Ditillo & Lisi, 2014, p. 25). Malmi and Brown (2008) state that management control systems do not operate in isolation, and management control systems operate as a package (Malmi & Brown, 2008, p. 287). Furthermore, a large part of the research literature studies formal management control systems, while there is limited understanding of the impact of informal management control systems (Bebbington & Thomson, 2013, p. 277). Bebbington and Thomson (2013) find that research literature studying the concept of sustainability management control does not conceptualize what is necessary for organizations to develop sustainable thinking (p. 277). In earlier research literature, there has been argued that management control systems in organizations need to integrate a business model for circular economy. However, there are only a few studies regarding this issue (Svensson & Funck, 2019, p. 391). Crutzen et al. (2017) call for further research on management control for sustainability in a holistic approach (p. 1300).

### **2.5.1 The case of waste management**

In 2020, the total amount of waste generated in Norway reached 11.6 million tons (Miljødirektoratet, 2021b). The projections show an increase in the volume of waste mainly from three sectors, where domestic waste is one of them. Accordingly, focusing on this sector is necessary (Miljøverndepartementet, 2013, p. 27). Domestic waste along with industrial, and dangerous waste are the different categories of waste according to the division of the Norwegian Pollution Control Act (Folkehelseinsittuttet, 2021). The management of domestic waste is constrained to the municipals by the Norwegian Pollution Control Act (Forurensningsloven, 1981, § 30). Thereby, Norway consists of 356 municipalities, legally

obligated to collect and ensure proper waste management of domestic waste (Forurensningsloven, 1981, § 30; Regjeringen, 2021). Waste management implies all activities necessary to manage waste, such as collection, sorting, and treatment (Ranjbari et al., 2021, p. 2).

The waste management industry consists of several businesses that aim to collect and handle waste (Avfall Norge, n.d.). Such as example, waste disposal companies, better known as waste management companies. The municipals legally obligated management of waste can be done by either having their own waste management companies, establishing collaborative companies across municipalities, such as inter-municipal companies, or setting out an offer (Meld. St. 45 (2016-2017), p. 21). The public sector is increasingly organizing its operations as if they were private companies (Jacobsen, 2020, p. 80). As a result, an increasing proportion of municipal services take place within organizational frameworks with similarities to private enterprises (Jacobsen, 2020, p. 81). There are various forms of organization that municipalities can establish, each of which has its characteristics (Jacobsen, 2020, p. 81-85). The companies included in this thesis are all owned by either one or multiple municipalities in Norway. The main distinction in the explanation of various company forms owned by the municipalities concerns whether the companies are independent legal entities (Ringkjøb et al., 2008, p. 13). Relevant to this research, are two types of companies which are joint stock companies and inter-municipal companies where both forms of companies are independent legal entities (Jacobsen, 2020; Ringkjøb et al., 2008). Thereby, municipalities can establish a separate company and distribute their responsibility in accordance with the Pollution Act for treating domestic waste (Forurensningsloven, 1981, § 30).

The municipalities can exclude the management of domestic waste from the competition by granting exclusive rights. An exclusive right is a right to perform a service that excludes other actors from offering the same facility, thus creating a monopoly (Meld. St. 45 (2016-2017), p. 21). Inter-municipal and municipal companies established to manage domestic waste can be granted the exclusive right, even if the company also carries out extensive commercial activities which are not subject to the exclusive right (Meld. St. 45 (2016-2017), p. 21). Furthermore, The Norwegian Polluting Control Act establishes the principle that the polluter must pay (Forurensningsloven, 1981, § 2). All costs of legally mandated domestic waste management must therefore be covered by the waste fee, the so-called self-cost principle to ensure that the regulation is observed (Meld. St. 45 (2016-2017), p. 20). The fee is used to steer waste management towards a proper treatment consisting of minor environmental

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damage (Meld. St. 45 (2016-2017), p. 18). Municipalities are not allowed to subsidize waste management or to profit from it and must have separate accounts for statutory management of domestic waste and commercial waste management (Meld. St. 45 (2016-2017), p. 20).

Municipal and domestic waste management is the foundation for circular economy to attain better resource management and excellent waste prevention by closing the material loop between the waste input and output (Tsai et al., 2020, p. 1). In the past, the work of waste management companies has consisted of making proper collection and treatment of the waste to ensure that nothing goes astray. The waste management industry has succeeded in this, and the work today is, to a greater extent, about managing the resources in the waste in a good way (Miljødirektoratet, 2021a). This is because moving from a linear to a circular economy and achieving environmental sustainability depends on effective waste management (Ranjbari et al., 2021, p. 2). In 2020 approximately 46% of all waste created was recovered through material recycling, which is when waste resources are used as raw materials to produce new materials or products (Miljødirektoratet, 2021b). Circular economy, however, requires more waste to be processed in the upper levels of the waste hierarchy. Thereby, designing and managing waste management systems are central to accomplishing excellent resource management (Ranjbari et al., 2021, p. 2). In recent years, and to a rapidly increasing extent, waste management companies have developed business models and adopted technologies that reduce the use of primary goods and put a focus on sustainability goals to meet the increasing consumer awareness of resource use (Meld. St. 45 (2016-2017), p. 8). The advanced waste management system in Norway causes a more significant generation of recycled waste. The expertise and capacity to utilize waste offer intriguing possibilities in Norway (Meld. St. 45 (2016-2017), p. 7).

## 2.6 Research questions

After an analysis of the theory and previous research, five research questions have been carefully derived from the main research question. When combined, these five research questions, each representing one of the elements in the framework of Malmi and Brown (2008), provide an answer to the main research question, “How are management control systems used towards circular economy in Norwegian waste management companies?”. At the end of the chapter, the theoretical framework of this thesis will be presented.

**Research question 1 – Cultural controls**

According to the framework of Malmi and Brown (2008), cultural controls are presented at the uppermost level (p. 295). Thus, it is argued as the control system have an overall effect on the organization (Malmi & Brown, 2008, p. 295). In relation to previous research by Morsing & Oswald (2009), they found that organizational culture is important for companies in relation to sustainable practice (p. 94). Organizational culture can substantially affect the behavior of the employees, the success, motivation, management, cooperation, and coordination of the organizations (Jacobsen & Thorsvik, 2019, p. 120). According to Flamholtz (1983), cultural controls appear through the beliefs, values, and social norms of the company established to influence the behavior of the employees (p. 158). Followingly, it consists of the components of value-based, symbol-based, and clan controls (Malmi & Brown, 2008, p. 292). These elements are in accordance with what Crutzen et al. (2017) define as informal controls used in management control for sustainability, as they are not explicit measures to control behavior (p. 1292).

The value-based control presented by Malmi and Brown (2008) is based on the belief system of Simons (1995), which is elaborated in chapter 2.4.1. Value-based control can work in three different aspects, firstly by recruiting individuals with specific values, and secondly by individuals being socialized so their values are changed according to the values of the organization (Jacobsen & Thorsvik, 2019; Simons, 1995). Lastly, when values are explicated and employees act according to them even if they are not their values (Jacobsen & Thorsvik, 2019; Malmi & Brown, 2008; Simons, 1995). To achieve this, value-based management can be used, as this type of management involves influencing the behavior of employees, so they harmonize with the values of the organization (Kirkhaug, 2013, p. 89).

The second division of cultural controls, and in line with the definition of informal control, is symbol-based control which consists of visual elements created by the company to establish a certain culture (Crutzen et al., 2017; Malmi & Brown, 2008). Artifacts are expressions of the culture that can be sensed, either by being seen, heard, or touched (Jacobsen & Thorsvik, 2019, p. 130). What characterizes the underlying cultural elements are conveyed in the artifacts. For the artifacts to function as symbols, a central element is that they must be interpreted (Jacobsen & Thorsvik, 2019, p. 130). Artifacts only function as symbols when individuals have devoted a sense to the artifact (Jacobsen & Thorsvik, 2019, p. 130). Symbols have several key functions in an organization, as they reflect the organizational culture, and visualize norms and values, among other things (Jacobsen & Thorsvik, 2019; Malmi & Brown, 2008). Symbols can

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therefore be used as a control system to affect behavior (Malmi & Brown, 2008, p. 294). In relation to sustainability, symbols have in previous research been relative to green buildings, the managers setting a good example by using public transportation or through letters who emphasize a more sustainable behavior (Crutzen et al., 2017, p. 1295).

The third element of cultural controls presented by Malmi and Brown (2008) is clan control (p. 294). In an organization, there can exist cultures in smaller cultures or groups, and these can be characterized as clans. Clan control consists of implementing values and beliefs through rituals (Jacobsen & Thorsvik, 2019; Malmi & Brown, 2008). Lastly, Malmi and Brown (2008) elaborate that training can be included in two of the control systems, one of them cultural controls as it can be a form of managing the organizational culture (p. 294). Based on the assessment of the previous theory presented, the first research question addresses cultural controls in management systems towards circular economy. This is because cultural controls are important in the context of management control and sustainability (Ditillo & Lisi, 2014, p. 36). The research question has been carefully designed to contribute to answering the main research question:

Research question 1: How are cultural controls used towards circular economy in waste management companies in Norway?

### **Research question 2 – Planning controls**

Planning involves the process of choosing goals for the organization as well as the means to achieve the objectives (Flamholtz, 1983, p. 154-156). According to Malmi and Brown (2008), planning is controls exercised ex-ante (p. 291). In chapter 2.4.2 planning controls by Malmi and Brown (2008) were explained to be exercised as a control mechanism through three different aspects that influence behavior. Planning thereby clarifies the expectations for the organization members related to the level of effort and behavior. It facilitates coordination to ensure that the goals coincide with expected effort and behavior (Malmi & Brown, 2008, p. 291).

As previously stated, Malmi and Brown (2008) make a distinction between action- and long-term planning in their framework (p. 291). Where the difference between the two planning approaches is the time aspect of the plans. Long-term planning is the strategic plan designed by the organization (Johanson & Madsen, 2013, p. 19). According to the dictionary, a strategy is defined as “a plan, method, or series of maneuvers or stratagems for obtaining a specific

goal or result” (“Strategy,” n.d.). However, the elaboration of strategy is not included in the framework of Malmi and Brown (2008). In the relation to incorporating sustainability in companies, planning controls appear important from previous research as it is elaborated on the use of strategies to integrate the principles of sustainability (Riccaboni & Leone, 2010, p. 139). Furthermore, the other form of planning control is action planning (Malmi & Brown, 2008, p. 291). Action planning has a more tactical focus and entails goals in short-term, which is usually considered to be the next 12 months (Johanson & Madsen, 2013; Malmi & Brown, 2008).

Planning and budgeting are often seen in the context of each other (Flamholtz, 1983; Merchant & Van der Stede, 2007). Malmi and Brown (2008), however, separate planning controls from the budget and point out that planning can exist without a relationship to finance than with a more strategic focus. (p. 291). Based on the theories presented in the preceding paragraphs, the second research question has been prepared as part of understanding the holistic management system in relation to circular economy:

Research question 2: How are planning controls used towards circular economy in waste management companies in Norway?

### **Research question 3 – Cybernetic controls**

The third research question is related to how cybernetic controls are used in relation to circular economy. As previously stated in chapter 2.4.2, cybernetic controls consist of four elements, which all have a core of affecting the behavior of the employees in the company (Malmi & Brown, 2008, p. 292). These four elements are in line with what Crutzen et al. (2017) define in relation to management control for sustainability as formal controls (p. 1293). If the cybernetic controls are not correctly used, it would rather be an information system than a control system. This, for instance, would be if the managers adjusted their behavior when unwanted results occurred without including other employees. By connecting behavior to objectives and creating accountability for variations in performance, cybernetic controls are used as a management control system contrary to an information system (Malmi & Brown, 2008, p. 292). The four cybernetic controls, budget, non-financial and financial measures, and hybrid measures will in this chapter be further elaborated.

The use of budgets as a control system is, according to Hansen et al. (2003), a result of the “[...] ability to weave together all the disparate threads of an organization into a



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comprehensive plan that serves many different purposes, particularly performance planning and *ex ante* evaluation of actual performance *vis-à-vis* the plan” (p. 96). Therefore, Hansen et al. (2003) claim that budgets are the cornerstone of management control of almost all organizations and are extensive among companies (Hansen et al., 2003, p. 95). This is because budgets enable coordination and control of the activities of the organization (Flamholtz, 1983, p. 159). The budget is a comprehensive plan, where the budget itself is a numerical expression of the action plans of the company for a given future period (Hoff & Helbæk, 2021, p. 26-27). Thereby, the organization converts the predicted effects and outcomes into numerical representations (Hoff & Helbæk, 2021, p. 26-27). As a result, the numbers are of little use when examined in isolation; instead, they must be interpreted considering the strategic goals of the departments and the underlying assumptions and suggested execution strategies (Hoff & Helbæk, 2021, p. 26-27). As a control system, the focus of the budget is on planning for desired achievements of behavior and examining if the achievements are in accordance with the plans (Malmi & Brown, 2008, p. 293).

The second and third cybernetic systems conducted by Malmi and Brown (2008) consist of financial and non-financial measurements (p. 292). According to Ittner and Larcker (1998), the choice of performance indicators is among one of the greater challenges of a company (p. 205). Since the performance measurement system is essential in developing strategic plans, assessing the accomplishment of corporate goals, and rewarding management (Ittner and Larcker, 1998, p. 205). The prevalent financial measurements are earnings per share and return on investments, but many different financial measurements exist (Ittner & Larcker, 1998, p. 209). Financial measurements are limited, and non-financial measurements are then embraced. Non-financial measurements consist of non-numerical measures (Hoff & Helbæk, 2021, p. 25).

Hybrid measurements contain financial and non-financial measures and consist, for example, of balanced scorecards (Malmi & Brown, 2008, p. 292). The balanced scorecard has been elaborated thoroughly in the existing literature and is presented by, among others, Ittner and Larcker (1998). The balanced scorecard is an addition to traditional measures and consists of non-financial measurements in three areas: internal business process, customers, learning, and growth (Ittner & Larcker, 1998, p. 217). All four aspects elaborated in the preceding paragraphs are collectively equal to cybernetic controls. As the use of both formal and informal controls is essential in management control systems for sustainability (Riccaboni & Leone,

2010, p. 142), the third research question has been created regarding the use of cybernetic controls:

Research question 3: How are cybernetic controls used towards circular economy in waste management companies in Norway?

#### **Research question 4 – Reward and compensation controls**

The fourth research question is in relation to the use of reward and compensation controls concerning circular economy. Theories of Bonner and Sprinkle (2002), Flamholtz et al. (1983), and Ittner and Larcker (2001) contribute to the understanding of how reward and compensation controls are exercised. According to Flamholtz et al. (1983), reward systems can vary from extrinsic to intrinsic (p. 156). Reward and compensation controls are a result of employees executing desired behavior, and rewards are therefore, a mechanism of performance appraisal (Flamholtz et al., 1983, p. 156). Bonner and Sprinkle (2002) highlighted how monetary incentives are commonly used as a rewarding method to increase effort and performance (p. 303). Furthermore, the use of monetary incentives can function as a control system by directing effort direction, duration, and intensity (Bonner & Sprinkle, 2002, p. 304). Reward and compensation controls aim to motivate and increase the performance of employees (Malmi & Brown, 2008, p. 294). As the value created in organizations is increasingly dependent on the competence and skills possessed by employees it makes motivation a crucial element (Jacobsen & Thorsvik, 2019, p. 228). Monetary incentives are used to obtain motivation, and the research regarding incentive theory has a principal agency theory as a point of departure (Gibbons & Roberts, 2013, p. 58)

The control system of reward and compensation focuses on motivating individuals to achieve the desired goals of the organization (Malmi & Brown, 2008, p. 293). The classic principal agency model presented by Gibbons (1998) consists of an organizational model which shows how the trade-off between incentives and insurance results in different actions (p. 116). The principal-agent theory is further elaborated in chapter 2.1, along with the use of incentives in practice and the aspect of when not to use monetary incentives.

As Flamholtz et al. (1983) acknowledge, a reward can also be intrinsic (p. 156). Research indicates that intrinsic motivation has a significantly stronger positive effect than extrinsic motivation in the workplace, productivity, presence, and desire to stay in the organization (Jacobsen & Thorsvik, 2019, p. 234). An essential element in effective reward systems is

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clarifying the needs of the individual, where Maslow's pyramid of needs is an influential contribution. The hierarchy consists of five levels, starting with physiological needs and moving upwards with safety, social, needs for recognition, and needs for self-realization (Jacobsen & Thorsvik, 2019, p. 232-233). Where the concept of the hierarchy is concerning that higher levels will not influence behavior until the need at lower levels is met. However, the order may vary with the individual. Some will be motivated by a pay raise, and others will be motivated by positive feedback. Maslow's pyramid describes a transition from external rewards that satisfy a lower level of the pyramid to internal rewards that meet needs at a higher level (Jacobsen & Thorsvik, 2019, p. 232-233). Previous research on the use of reward and compensation controls in the aspect of sustainability, found a necessity for organizations to use broader reward and performance measures to align the performance of employees with the objectives of the organization (Dutta & Lawson, 2009, p. 22). Therefore, to investigate how the reward and compensation controls are used in waste management companies towards circular economy, the fourth research question is:

Research question 4: How are reward and compensation controls used towards circular economy in waste management companies in Norway?

#### **Research question 5 – Administrative controls**

The fifth, and last research question created to contribute to the main research question is regarding the use of administrative controls. Administrative controls include how the behavior of employees is directed through the organization of the company, where the organizational structure, governance structure, procedure, and policies are the three main components (Malmi & Brown, 2008, p. 293).

Organizational structure as a control system is stated by, Otley and Berry (1980) as “Indeed, organization can itself be viewed as a control process, occurring when groups of people feel the need to cooperate in order to achieve purpose which require their joint action” (Quoted in Flamholtz, 1983, p. 158). If the organizational structure and design encourage contracts and relationships within the boundaries of the company, it is used as a control system (Malmi & Brown, 2008, p. 293). According to Flamholtz (1983), the dimensions of structural control can occur in a variety of ways, such as the degree of centralization or decentralization, the degree of horizontal or vertical control, or specialization (p. 158). The organizational structure that arranges for specialization facilitates control by decreasing variation in behavior and thereby increases the certainty of the performance of employees (Flamholtz, 1983, p. 158). This is

because the organizational hierarchy, thereby the structure of the organization, has a strong influence on the behavior of employees (Alvesson & Kärreman, 2004, p. 437).

In accordance with Malmi and Brown (2008), corporate governance consists of the structure and composition of the board and the different management and project groups (p. 294). Corporate governance also underlies the formal authorities and responsibilities, as well as the systems that encourage and ensure the cooperation of activities across organizational divisions (Abernethy & Chua, 1996; Malmi & Brown, 2008). This can be done through meetings or creating due dates, which control the behavior of the employees (Abernethy & Chua, 1996; Malmi & Brown, 2008).

The third control mechanism of administrative controls is procedures and policies, which is the bureaucratic approach to behavior and processes within a company (Malmi & Brown, 2008, p. 294). By creating policies and procedures which include standards for operations and processes, the behavior of employees is controlled (Malmi & Brown, 2008, p. 294). A company is subject to both internal and external control. External control is directed at the business from the outside (Kristoffersen, 2014, p. 31). On the other hand, internal control should contribute to the business achieving its objectives, and is the process implemented by the board, managers, and employees to ensure compliance with rules and regulations, and ensure managers achieve goals reasonably (Kristoffersen, 2014, p. 31-32). All these combined constitute administrative controls. Thus, we have raised the fifth research question:

Research question 5: How are the administrative controls used towards circular economy in waste management companies in Norway?

## 2.6.1 Theoretical framework

With the previously presented theory as a background, a theoretical framework has been carefully prepared based on the five research questions in line with the main research question. The model provides a comprehensive visualization of the research based on the main research question, as well as an in-depth overview of how each control system and research question have a function in the overall context. The elements visualized in the darkest boxes are not included explicitly in data collection. However, they are included in the framework to ensure an understanding of the research in a greater aspect. On the other hand, the lightest boxes contain elements of each of the five main forms of control. As the arrows illustrate, the five parts are brought together in the operation of management control systems, which altogether are used towards circular economy. Moreover, the framework does not include research results but forms the basis for presenting the results in chapter 4 and discussing the findings in chapter 5.

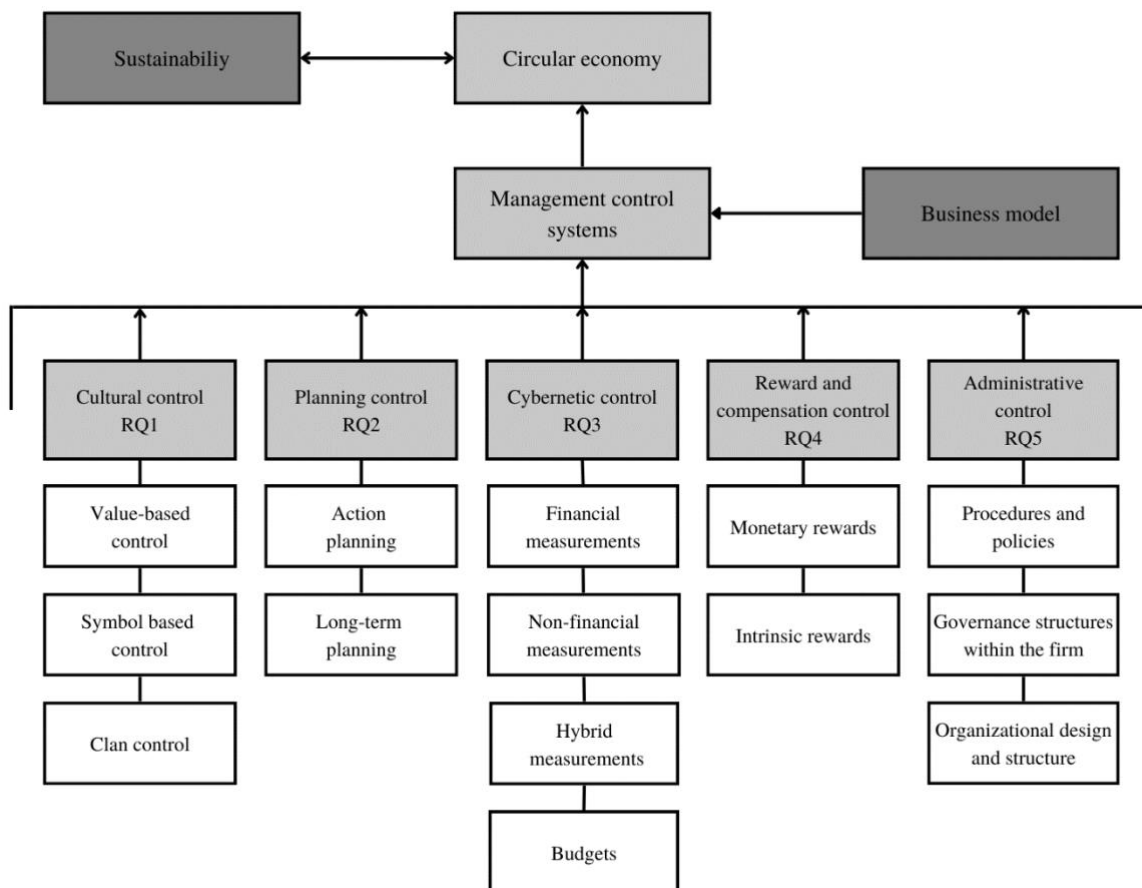


Figure 1: Theoretical framework

### 3. Methodology

This chapter aims to explain the methodological approach to answer the main research question: “How are management control systems used towards circular economy in Norwegian waste management companies?”. The chapter starts with a presentation of the research philosophy of the study, and we will further explain the research approach and design. Furthermore, the method of collecting and analysis the data will be accounted for before the research method is evaluated. Finally, there will be an elaboration on how we sought to ensure high ethical standards in the study.

#### 3.1 Research philosophy

Saunders et al. (2016) refer to the research philosophy as “[...] a system of beliefs and assumptions about the development of knowledge” (p. 124). A research philosophy that is carefully conducted can contribute to creating coherence in the research project by substantiating methodological choices, research strategy, and techniques for data collection and analysis (Saunders et al., 2016, p. 124-125). Saunders et al. (2016) distinguish between two opposing extremes of research philosophies: objectivism and subjectivism (p. 128). The latter integrates assumptions from the arts and humanities and claims that perceptions and subsequent actions of social actors create the social reality (Saunders et al., 2016, p. 130). On the other hand, objectivism emphasizes the assumptions of natural sciences, which in its most extreme form implies a belief that there is only one true social reality that is relatively unchanging that is experienced by the social actors (Saunders et al., 2016, p. 128).

A research philosophy that seeks to reconcile the two extremes of objectivism and subjectivism is pragmatism. Lukka and Modell (2010) explain that in a pragmatic research philosophy, the researcher acknowledges that there can be several truths because of the “[...] belief that there is a continuous interplay between ‘the objective world’ and our conception of it” (p. 467). Pragmatists are realistic in their approach, and only the true arguments are those rationally supported by human cooperation and communication (Lukka & Modell, 2010, p. 467). We will in this research have a pragmatic research approach, as the research question is central in this approach and constitutes the most important terminal for choosing the design and strategy for the research, and theory plays a central role (Lukka & Modell, 2010, p. 466-467).

## 3.2 Research approach

A distinction is mainly made between two theoretical approaches in research: deductive and inductive studies. In a deductive research approach, the assumptions are based on existing theories. Furthermore, you collect data that can support or disprove the theory the study is based on. With an inductive research approach, the starting point is to collect data to explore or develop a theory (Saunders et al., 2016, p. 51). Saunders et al. (2016) explain a third theoretical approach; abductive studies where the concept is to collect data to observe, identify and explain a conclusion. The research generates new or modified existing theories (Saunders et al., 2016, p. 144-145).

In our research, we want to explore the phenomenon of how Norwegian waste management companies use management control towards circular economy. Lukka and Modell (2010) explain that theory plays a central role in pragmatic research, as one needs predetermination or theory to see the truth (p. 466). Furthermore, Lukka and Modell (2010) believe that theory is an essential guide in abductive research, to understand and explain patterns in interpretive unstructured data of the research (p. 465). Saunders et al. (2016) explain that an abductive research approach is well suited for research where you aim to generate new or existing theories, identify, and explain patterns, and themes, or explore a phenomenon (p. 152). Our research will therefore be conducted with an abductive research approach as we will use data and existing theory to explore a phenomenon.

## 3.3 Research design

Research design is the overarching plan to answer the research question. This includes everything that encompasses the source of data collection, the suggestion of how data will be collected and analyzed, and ethical perspectives (Saunders et al., 2016, p. 163). The design distinguishes between qualitative and quantitative methodology. The methodologies differ in the sense that quantitative methodology consists of numerical data, and qualitative methodology entails non-numeric data (Saunders et al., 2016, p. 165). Quantitative methodology is characterized by using statistical techniques to investigate relations between variables, and the purpose of the research is often to use the data to test a theory (Saunders et al., 2016, p. 166).

On the other hand, the qualitative methodology often aims to acquire an in-depth understanding and meaning. Often the methodology can be referred to as naturalistic as the researcher operates in a natural setting where subjective and socially constructed opinions about the studied phenomenon must be sensible. The methodology is characterized by using various techniques for data collection (Saunders et al., 2016, p. 168). The thesis aims to account for nuances in different management systems rather than capturing statistically significant conclusions. It is, therefore, suitable to have a qualitative research design.

### **3.3.1 The purpose of the research**

According to Saunders et al. (2016), the purpose of a study can be placed within four categories, respectively: exploratory, descriptive, explanatory, and evaluative (p. 174-176). Exploratory research seeks to obtain new insight into the theme of interest by asking open-ended questions, whereas descriptive research strives to depict individuals, circumstances, or events accurately. While explanatory research seeks to explain links between various variables, evaluative research determines how effectively something functions (Saunders et al., 2016, p. 174-176). The research aims to answer the main research question. Accordingly, the research is exploratory as it seeks to contribute new insights into the phenomenon rather than preparing precise descriptions or establishing clear connections. Exploratory studies are especially appropriate in research when the desire is to understand a phenomenon (Saunders et al., 2016, p. 174-176).

### **3.3.2 Research strategy**

A research strategy is “[...] a plan of how a researcher will go about answering her or his research question” (Saunders et al., 2016, p. 177). To respond to the specific research question, the research strategy must be reasonably coherent across the research design. Case studies are one of several possible research strategies frequently used in qualitative research. (Saunders et al., 2016, p. 178). In this thesis, a case study is considered an appropriate choice of strategy. A case study is an in-depth analysis of a subject or phenomenon in its actual context, which leads to a rich development of the theory (Saunders et al., 2016, p. 184-185). Case study research is frequently used when the examined phenomenon does not have apparent boundaries. Once the case study is defined, it seeks to comprehend the dynamics of the subject of study within its setting (Saunders et al., 2016, p. 184). Case studies are particularly well suited for this thesis since they allow an understanding of the phenomenon and provide new



insight, which is necessary as they are deemed to be an exploratory study. Thereby will provide an answer to the research questions of the study.

Within case studies, a distinction is made primarily between single case studies and multiple case studies. The latter consists of several cases being studied, and a single case study is only based on one case (Saunders et al., 2016, p. 186). The researcher must determine what is required for the phenomenon before deciding whether to select a single case or a multiple case study (Gustafsson, 2017, p. 3). Multiple cases allow one to compare and contrast the phenomenon under investigation and determine whether or not the findings are valuable. Moreover, it allows for a deeper analysis of research problems and the development of theories (Gustafsson, 2017, p. 3). Therefore, a multiple case study was appropriate for this research as the waste management industry consists of several relatively similar companies, making it possible to replicate the research. Multiple cases also provide a good representative understanding of practices in companies. Thereby, it is achievable to study each case individually as well as across each case (Gustafsson, 2017, p. 3)

In a multiple case study, the number of studies to combine will depend on how much new information each case produces and how well-known the phenomenon being examined is beforehand (Gustafsson, 2017, p. 4). Contrarily, Dyer and Wilkins (1991) assert that the critical requirement is that the researcher adequately describe and comprehend the context of the relevant case so that the reader may understand it and develop a theory concerning the context (Quoted in Gustafsson, 2017, p. 4). Our multiple case study consists of five different cases, including one company in each case. By including several different cases, it ensures an extensive understanding of the subject (Yin, 2018, p. 53). Additionally, a distinction is made between holistic case studies and embedded case studies, where the unit of analysis is distinct. In a holistic approach, the entire case unit is examined. In contrast, an embedded approach studies the sub-units through the case, for instance, by reviewing various sub-departments in organizations (Saunders et al., 2016, p. 187). Our case study has a holistic approach, as we want to look holistically at how waste management companies in Norway use management control systems towards circular economy, and the study helps to illustrate a broader understanding of this phenomenon.

### **3.3.3 Time horizon**

There are two different time horizons to design your research (Saunders et al., 2016, p. 200). Saunders et al. (2016) differentiate between cross-sectional and longitudinal studies (p. 200). The latter involves studying a change and development over a longer period, while a cross-sectional study involves a study of a phenomenon at a particular time (Saunders et al., 2016, p. 200). In this study, we will explore how waste management companies use management control systems towards circular economy today. Therefore, a cross-sectional study would be most appropriate. Our study has a time constraint of four months; therefore, it is natural to categorize it as a cross-sectional study. The interviews were conducted over a short period, and each of the participants from the organizations was interviewed once. This coincides with how Saunders et al. (2016) describe cross-sectional studies (p. 200).

## **3.4 Data collection**

In a case study, there can be several different sources for data collection (Yin, 2018, p. 111). To answer the research questions, it is necessary to adapt the data collection to the purpose of the study and the research design. A distinction is made between primary data and secondary data (Saunders et al., 2016, p. 316-318). In this study, primary data has been collected through semi-structured interviews. Whereas secondary data has been collected through public documents from the participating companies. This chapter will contain a discussion of how data have been collected through these two different types of data collection.

### **3.4.1 Primary data**

In case studies, interviews are one of the most important sources in the collection of data, and interviews are both targeted and generate good insight as they can provide explanations and personal views in the form of perceptions, opinions, and attitudes (Yin, 2018, p. 118). In our case study, we have collected primary data through semi-structured interviews for several reasons. Semi-structured interviews are non-standardized interviews with a mix of formal and informal approaches that allow flexibility (Saunders et al., 2016, p. 391). In case studies, Yin (2018) explains that interviews should come closer to a conversation that is guided, rather than structured questions (p. 118). Our interviews were structured regarding central themes with associated overarching questions that guided the content of the interviews. We included open-ended questions which allowed the respondent to reflect upon the topic, and where we could

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follow up with questions that were necessary for our data collection. Further, Saunders et al. (2016) explain that in semi-structured interviews, the researcher can ask the respondent additional questions to further elaborate and explain the topic, and the questions asked can be varied depending on the conversation in the interview (p. 391).

The waste management companies participating in this study are carefully selected with the expectation that our findings will be relatively similar in each of the companies (Saunders et al., 2016, p. 187). In total, we conducted 11 in-depth individual interviews from five different companies, where each of the interviews lasted between 30-60 minutes. The interviews were conducted in the period of October 2022. The participants of the interviews were selected regarding the organizational structure of the different companies. Some were selected by us based on their position in the company. While others were selected by the company based on who they thought was relevant to the research. Each of the participants was on management level with a close connection to management control systems and circular economy in the companies, an overview of the participants can be found in Appendix A.

Saunders et al. (2016) explain the importance of planning for a successful semi-structured interview (p. 401). The level of knowledge about the topic and organizational and situational context will help to demonstrate the credibility of the researcher (Saunders et al., 2016, p. 401). Before the interviews, we explored relevant theories and literature associated with sustainability, circular economy, and management control systems associated with waste management. To get further knowledge about each company, we searched for information on their website and written reports. The preparation contributed to assessing the relevance and accuracy of the answers of the participants, and it allowed us to ask them to elaborate on their answers. From this, we prepared topics and questions for the interview guide (Appendix B).

Furthermore, supplying information to the participant before the interview may also help to demonstrate credibility for the researcher (Saunders et al., 2016, p. 402). The questions for the interviews were structured around the research questions of the study and were open-ended questions which made it possible for the participant to reflect on the questions. Both the interview guide and the declaration of consent (Appendix C) were sent to the participants as information before the interviews. This made it possible for the participant to prepare and reflect upon the theme of the interview. The declaration of consent was sent to make sure the participant was aware of and understood their rights, as well as how their information and contribution was processed afterward (Saunders et al., 2016, p. 253-254).

To ensure that all participants had the opportunity to participate in the research due to geographical constraints, all 11 interviews were conducted digitally. This also ensured that the participants had the same starting point for the interviews (Thunberg & Arnell, 2022, p. 761). The interviews started with us introducing ourselves and the purpose of the research, as well as pointing out various formalities regarding voluntary participation, anonymity, confidentiality, and video recording. The purpose of this information was to make the participants comfortable and willing to share information, to establish our credibility, and gain the confidence of the participant (Saunders et al., 2016, p. 406).

### **3.4.2 Secondary data**

In addition to the primary data, the data collection of the study also included secondary data. Secondary data is data that was originally gathered for another purpose (Saunders et al. 2016, p. 316). Saunders et al. (2016) explain that such data can contribute to answering the research questions by enabling further knowledge about the research object (p. 316). In case studies secondary data is often used where the purpose is to study management and control in organizations (Saunders et al., 2016, p. 318). Saunders et al. (2016) divide secondary data into three main groups: document-based, survey-based, and data from multiple sources (p. 318). Document-based secondary data is commonly used in studies combining primary and secondary data (Saunders et al., 2016, p. 319). In our study, we will use secondary data in the form of document-based data. The documents mainly used in this study are publicly available reports like annual reports, strategy plans, and information on the web pages of the organizations. The secondary data has contributed to answering the research questions in preparation for the interviews and in addition, confirmed the information given by the participants in the interviews. An overview of the secondary data used in this thesis can be found in Appendix D.

## **3.5 Data analysis**

To analyze the data collected, we organized it through a thematic analysis. Saunders et al. (2016) refer to it as a process where consistent patterns or similarities are found in the collected data material (p. 579). The approach of thematic analysis is both flexible and systematic, as you analyze the data orderly and logical regardless of the philosophical position of the study (Saunders et al., 2016, p. 579). It involves procedures of getting to know the data material,

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coding, and identification, as well as the systematization of themes (Saunders et al., 2016, p. 580).

The process of getting to know the data first involves producing a transcript of the interviews (Saunders et al., 2016, p. 580). Each of the interviews was video recorded and after the interviews, we started the process of transcribing. Saunders et al. (2016) describe transcriptions as a verbatim reproduction of what has been said in the interviews (p. 572). The transcriptions allowed us to get familiar with the data and were used throughout the analysis process.

Coding of data is used to find similarities in the data material. This involves finding codes that can help to categorize the content of the interviews (Saunders et al., 2016, p. 580). Saunders et al. (2016) indicate that the purpose of coding is to make the data more easily accessible for analysis since qualitative data materials are large and complex (p. 580). The codes can be created in different ways based on the research approach, expressed through the research question and objectives (Saunders et al., 2016, p. 583). The codes used in our data analysis were theory-driven, where the codes were derived from existing literature (Saunders et al., 2016, p. 582). We based the codes on our theoretical framework presented in chapter 2.6.1.

Furthermore, the content from the interviews was grouped under different codes. The grouping of data is called themes, which Saunders et al. (2016) describe as broad categories that can consist of either one code or several codes that relate to the research question (p. 584). An important part of the thematic analysis concerns defining themes and the relationships between them. To form a well-structured data set, the codes and associated themes had to be assessed, evaluated, and reorganized (Saunders et al., 2016, p. 585). By reading through the coded data, which had been organized under each theme, we could evaluate whether some themes were to be combined or if parts of the data were irrelevant to the purpose of the study (Saunders et al., 2016, p. 585).

### 3.6 Data quality

Saunders et al. (2016) explain the importance of the quality of the data for underpinning the discussion of the research design (p. 201). By conducting a good research design, it can reduce the possibility of concluding wrongfully. To study the quality of the research the reliability and validity are evaluated (Saunders et al., 2016, p. 202). Reliability refers to which extent the

research can be replicated and is consistent, whilst validity refers to whether the research method is appropriate, the data analysis accurate, and the results generalizable (Saunders et al., 2016, p. 202). In the following sub-chapters, we will evaluate the research quality by looking at the reliability and validity of the thesis.

### **3.6.1 Reliability**

Reliability refers to the ability for research to be replicated and achieve the same findings (Saunders et al., 2016, p. 202). Nevertheless, Johannessen et al. (2011) indicate that qualitative research is difficult to replicate (p. 243). This is because, in qualitative research, unstructured data collection techniques are often used, and observations are often emotion-based and dependent on the context. Furthermore, the background of experiences and interpretations of the researcher can act as an instrument for the research (Johannessen et al., 2011, p. 243). Particularly, in semi-structured interviews, reliability can be hard to accomplish considering the absence of standardization (Saunders et al. 2016, p. 398). Nevertheless, a thorough description of the research design and the context and methods of the research can facilitate replication of the research (Saunders et al., 2016, p. 205).

Saunders et al. (2016) distinguish between internal reliability and external reliability (p. 202). Internal reliability is the ability to ensure consistency in the research. To achieve this, it can be necessary with more than one researcher to conduct the interviews and analyze the data to facilitate a discussion of the data and analysis (Saunders et al., 2016, p. 202). Throughout the collection of data in this thesis, both researchers participated in the interviews, and there was enabled an agreement on how to transcribe and code the interviews. In the analysis of the data, the content of the data material was discussed to achieve a collective agreement.

External reliability is related to if the research will generate the same results and findings if it was repeated in another setting or at a different time (Saunders et al., 2016, p. 202). In the case of qualitative research, replication of the study is not necessary, as one seeks to study the unique social understanding the participants have for a specific context (Saunders et al., 2016, p. 168). Nevertheless, we have ensured external reliability by explaining the research design, the reasons for the choice of strategy and methods as well as the data collection (Saunders et al., 2016, p. 399). Furthermore, a few threats to reliability can occur and Saunders et al. (2016) describe them as participant error, participant bias, researcher error, and researcher bias (p. 203).

Participant error is the factor that influences the actions and performance of the participants in the interviews negatively (Saunders et al., 2016, p. 203). To reduce the risk of participant error, it has been voluntary for the companies to participate in the study, and the time the interview takes place is agreed upon with the participant. The expected time consumption for the interview was also informed in advance, and during the interviews, this was fulfilled. Therefore, the interview was in line with the expectations of the participants (Saunders et al., 2016, p. 395). To reduce stress for the participants, the conversation was in line with the predefined topics during the interviews (Saunders et al., 2016, p. 243). Based on this, we conclude that participant error has had little impact on the reliability of the study.

Participant bias factors increase the risk of incomplete or incorrect information, which will influence and alter the results of the research (Saunders et al., 2016, p. 203). To prevent this, we have ensured that the participants and companies remain anonymous to reduce the risk of withholding useful information to protect the company and themselves. According to Saunders et al. (2016), the protection of the identity of the participants can help to ensure that the information is neither withheld nor changed during the interview (p. 203). Furthermore, Saunders et al. (2016) point out that the fear of being overheard can lead to an exaggeration of positivism in the answers of the respondents (p. 203). All the interviews were conducted digitally, and it was therefore not possible for us to assess whether the participants felt free to express themselves, as the participants chose the location themselves. To build trust, we informed the participant about what participation in the research meant for them and made sure they signed the declaration of consent, further, we started the interview with an introduction of ourselves and the purpose of the study (Saunders et al., 2016, p. 257).

Researcher errors are factors that change the perception of the researcher and the interpretation of data (Saunders et al., 2016, p. 203). Not being prepared enough and a lack of structure in the interviews can increase the chance that the researcher may misunderstand the participant, which can then lead to research errors (Saunders et al., 2016, p. 203). With semi-structured interviews, there is a certain probability of researcher error since the interview is not fully structured or planned. Nevertheless, recording the interview will reduce the probability of researcher error as one can go through the data material several times to capture the essence and ensure a correct interpretation of the answers of the participants. In addition, to increase our understanding of the research object and the interpretations of the participants, we spent time researching secondary data. This made it easier to ask follow-up questions during the interview and to understand the meaning of the statements from the participants. Throughout

the research process, great emphasis has been placed on avoiding researcher errors, we, therefore, consider it likely that this has had little impact on the research.

Finally, Saunders et al. (2016) describe researcher bias as factors that lead to biases in how the researcher perceives and reports data (p. 203). In the research process, we have had an objective approach to the participating organizations and participants of the interviews. To prevent researcher bias we have asked the participant as openly as possible and have been conscious to not give guidance to an answer. In addition to letting the participant share their understanding of concepts, as well as experiences on the topics. Saunders et al. (2016) point out the risk of researcher bias due to the desire to find interesting findings (p. 203). To limit such bias, we have ensured clear delimitations and included them in the research process. Whether our perception is correct cannot be fully guaranteed. However, we conclude that the reliability of the study has not been particularly affected as we have been aware of the challenges associated with researcher bias.

### **3.6.2 Validity**

Validity is about whether the research has investigated what it was intended to investigate and consists of the process of verifying the research data, analyses, and interpretation validation (Johannessen et al., 2011; Saunders et al., 2016). A known definition of validity is “An account is valid or true if it represents accurately those features of the phenomena, that it is intended to describe, explain or theorise” (Hammersley, 1987, p. 69). The validity of a research is therefore reflected by whether the methods and findings represent reality in a good way. To strengthen the validity of the study, we attempted to explain theoretical findings, gain clarity in terms, and show the methodological assessments in this chapter (Johannessen et al., 2011, p. 244). Saunders et al. (2016) distinguish between internal validity and external validity (p. 181).

Saunders et al. (2016) describe internal validity as the causal relationship between two variables (p. 203). This is not appropriate for qualitative studies, as they do not have the purpose of establishing causal relationships (Johannesen et al., 2011; Saunders et al., 2016). Internal validity also refers to credibility, which implies that the researcher ensures that the content of the replication of the data material is consistent with the opinions and perceptions of the participants (Saunders et al., 2016, p. 204). To strengthen the internal validity, all participants have therefore been given the opportunity to read through the transcription of the



interview to provide feedback on errors or ambiguities in the formulations. As motioned in chapter 3.6.1, both researchers participated in all the interviews and discussed opinions and experiences afterward, in addition to processing and analyzing the data to reduce the threat to internal validity.

The external validity concerns whether the findings in a study are transferable to similar social settings (Saunders et al., 2016, p. 204). In qualitative studies, it is the transfer of knowledge that is relevant, in contrast with quantitative studies where it is referred to as drawing conclusions based on findings (Johannessen et al., 2011, p. 248). Furthermore, Johannessen et al. (2011) describe transferability as being able to establish descriptions, concepts, interpretations, and explanations that can be used in other settings than the situation of the research (p. 248). To achieve transferability of the knowledge from the study, we have in the elaboration of the theory in chapter 2 described the concepts and established a theoretical framework for the thesis. Furthermore, we tried to ensure that our interpretations and explanations were clear throughout the analysis process, in the presentation of the empirical findings, as well as in the findings and discussion in chapter 4 and 5.

### 3.7 Research ethics

Saunders et al. (2016) refer to ethical issues that should be considered in research (p. 242). The ethical considerations of the study are mainly linked to questions about consent, privacy, and anonymity of the representatives and companies that have contributed to the study. In this research, we have considered these ethical issues.

One of the ethical issues Saunders et al. (2016) refers to is the importance that participation in the study should be voluntary (p. 244). The participants should give written, informed consent to take part in the study, which can be withdrawn at any time during the research process (Saunders et al., 2016, p. 244). As pointed out in chapter 3.4.1 the participating companies were presented with information about the research before the interviews in the form of the interview guide and declaration of consent. The participants were therefore able to make an informed choice as to whether they wanted to contribute to the study or not. In the declaration of consent, we informed the participant about practical information about the time frame, rights regarding voluntary participation, and extent of participation (Appendix C). As further presented in chapter 3.4.1 we informed the participants about the contents of the declaration

of consent before we started the interview, and the interview was in line with the information presented.

Furthermore, Saunders et al. (2016) refer to the importance of ensuring the anonymity of the participants taking part in the research (p. 244). Since there exist several different organizational forms of waste management companies in Norway as presented in chapter 2.5.1, we have in this research ensured that the representatives and companies have been anonymized. The participants are identified with their job titles, however, job titles that easily can reveal the identity of the participant and which company the participant represents have been changed to a relevant description of the position. Furthermore, the companies have been anonymized by being numbered in random order. Since the companies participating in this research have different organizational forms, we have chosen not to describe them in more detail, as this is revealing information about the companies, and they could easily be recognized. The information about anonymity was presented to the participants in the declaration of consent, and it was repeated in the interview.

Saunders et al. (2016) also refer to the ethical issue of ensuring the integrity and objectivity of the researcher (p. 243). To maintain this in our research, we chose to video record the interviews, and as presented in chapter 3.5, transcriptions of the interviews were sent to the participant for approval. The privacy of the participants was carefully assessed, as voice and image registration of a person is considered personal data by the Norwegian Center for Research Data (NSD, n.d.). The management of research data must comply with legislation (Saunders et al., 2016, p. 245), therefore we submitted our project to the Norwegian Center for Research Data for approval. To ensure privacy, and potential harm to the participant, we only stored the material that can be traced to the representatives in line with the Norwegian Center for Research Data guidelines. Furthermore, the data material was only used during the data analysis and was deleted by the end of December 2022.

## 4. Results

The purpose of this chapter is to present the data collected as accurately as possible and with the differences and similarities that may arise between the companies. The theoretical framework stated in chapter 2.6.1 forms the basis for the structure of this chapter, where the research questions create natural divisions of the results. This chapter will followingly form the base of the discussion in chapter 5.

As presented in the methodology, the primary data consists of 11 interviews from five waste management companies. Consequently, to a greater degree, this chapter consists of quotations from the respondents in the interviews. The quotations are reproduced as correctly as possible, but all data cannot be included due to the anonymity of the participants, which is further explained in the previous chapter, 3.7. Therefore, the quotations contain different characters, abbreviations, and markings. The definition and purpose of the different quotation marks are explained in Appendix E. Further, it was unfortunately not possible to include quotations of all answers from the respondents, but the quotes that have been selected are representative of similar answers. If there have been contradicting answers, they are included to show the variety between the companies. At the end of each chapter, a summary takes place where the aim is to briefly present the overall findings of each research question related to the results and the theoretical framework.

### 4.1 Cultural controls

In this section, data related to the first research question will be presented: “How are cultural controls used towards circular economy in waste management companies in Norway?”. By asking the participants questions on how cultural controls is used to guide behavior of employees towards circular economy, insight will be given to provide an answer to the research question related to culture as well as the main research question.

According to all the companies, circular economy has become entrenched in the culture as it is a natural element for the operations of the companies. Furthermore, since the purpose of the companies is based on circular economy. The statements of the companies are consistent with the belief system of Simons (1995) which elaborates that employees must understand the goals of the company to engage in cooperative behavior (p. 37). Circular economy is reflected in the values of all companies, where there is a variety of whether they have values with an explicit

or implicit distinction of circular economy. One of the companies with implicit distinction elaborated on a focus on fulfilling the existing values with updated content, and thereby circular economy is incorporated. Furthermore, the answers are compliant with how values and culture are used in the organization to affect the behavior of employees (Jacobsen & Thorsvik, 2019; Malmi & Brown, 2008).

*“Our vision is to be [REDACTED], and to be [REDACTED] [REDACTED], then we have to be circular. Since the core value is waste, we must think about the waste hierarchy and avoid producing too much residual waste, but much rather have a focus on environmental effects if we want to learn. And this is our vision, so it is essential to reflect upon this.” (CEO, Respondent 9, Company 5)*

*“[...] we have to use the vision and values to establish a common grounding in what we are going to achieve. I am not a fan of having fancy workshops to find some nice words, it is then more about using the ones we have and filling them with content that is up to date because they [visions and values, ref.] are quite spacious. We have the classic ones [vision and values, ref.] [...].” (CEO, Respondent 10, Company 4)*

Moreover, the collected data show some variation in the use of value-based control in the companies. Four of the companies elaborated that circular economy is a part of the culture and values because of the continued focus on circular economy over several years, and thereby behavior of employees corresponds with the objectives of the companies (Flamholtz, 1983; Jacobsen & Thorsvik, 2019; Kirkhaug, 2013). The use of values to direct behavior towards circular economy in the companies corresponds with the research of Svensson and Funck (2019). Furthermore, the companies elaborate on incorporating circular economy in the values over time has caused an establishment of the values as a part of the subconsciousness of the employees. This can further indicate that the personal values of the employees fit the organizations and, thereby, the value-based control is institutionalized through socialization or recruitment (Malmi & Brown, 2008; Simons, 1995). However, only one of the four companies highlighted the motivation towards circular economy of the employees because of their educational background and thereby can indicate the institutionalization through recruitment of individuals.

*“It [circular economy, ref.] is in our values and it is in our objectives. It is completely clear. The waste hierarchy, circular economic principles are the foundation. I think you could ask*

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*anyone, and they would have said that circular economy is natural for us since we have been doing this for a long time. We have come far longer than many others. It is not foreign to us.”* (CEO, Respondent 5, Company 1)

*“It is many years of work, and then there is a pride and confidence that it works, that there is no cheating. It is in much of our vision and the goals for the company.”* (Head of Communication, Respondent 3, Company 2)

*“[...] it is perhaps more implied, it is not written on the wall, but it [circular economy, ref.] is in what we do and why we do things. In the back of our minds when we do things.”* (Head of Finance, Respondent 11, Company 3)

Furthermore, two companies emphasized how circular economy is a part of the culture in the entire industry and thereby well incorporated into the culture of the companies. The respondents substantiate previous quotations by other companies, where they emphasize how circular economy is part of the culture because of the focus over several years and the fundamental of the company being based on those principles.

*“In the waste industry, people have been working with the waste hierarchy for many, many years. So, we have actually worked according to those principles for years. When we started talking about circular economy in 2019, we [the company, ref.] just implemented it in our strategy. So, it is very natural for anyone who works in the waste industry to think about the circular economy, it is ingrained in us [...].”* (CEO, Respondent 5, Company 1)

*“In a way, the company was created to deal with resource efficiency, and waste is not just a problem that we remove, but we must try to ensure that the waste gets a new life. And it is well incorporated because there has been a change in attitude over time, essentially in the entire industry, but also in the company.”* (CEO, Respondent 6, Company 3)

Additionally, as the respondents highlighted how the principle of circular economy is natural for the employees or there is a change over time, may indicate employees being socialized to act in accordance with the values of the organization (Jacobsen & Thorsvik, 2019; Malmi & Brown, 2008; Simons, 1995). On the other hand, the statements can also indicate a clear explanation of the values resulting in the behavior in accordance with the desires of the organization (Jacobsen & Thorsvik, 2019; Malmi & Brown, 2008; Simons, 1995). As previously quoted, some of the companies have explicitly included circular economy in their

values. Elaborations from two of the companies gave indications of an explicated value-based control. The Head of Communication in Company 2 elaborations indicated that circular economy is established in the values and vision of the company emphasizing a physical matrix where this is expressed as well as the promises, brand promise, goals, and business ideas. A matrix of explicated values that the employees are expected to follow corresponds to the description of how value-based control is conducted through explication (Malmi & Brown, 2008; Simons, 1995).

*“[...] we have a matrix with all of them [vision, promises, brand promise, values, goals, and business ideas, ref.]: what we should be, what we should not be, not be cheating. But we have such a matrix where all this is recorded. So, it is in a way a sense of security, that there is a reason why we have set up all these goals and vision and promises because we will work towards going higher up the waste hierarchy.”* (Head of Communication, Respondent 3, Company 2)

*“[...] But core values are not worth anything unless they are filled with content and an understanding, and that it affects our behavior, this is something we have to work on in all the (divisions of the company, ed.) [...]”* (General Manager, Respondent 8, Company 5)

There are indications of institutionalization of the values of circular economy through both socialization and explanation of values to achieve value-based control in all companies. There is also a possibility that value-based control has been exercised by both socialization and explanation, to achieve an anchoring of values and direction of behavior through cultural controls. Therefore, to determine concretely whether employees have been socialized or the values explained so the employees act in accordance would be difficult. Regardless of how value-based control is institutionalized, there are several indications of it being used in all companies as a control mechanism towards circular economy through cultural controls.

All companies highlighted the importance of ensuring that circular economy is a part of the culture of the entire organization and not limited to only a few based on the workspace. The respondents mentioned general staff meetings or online workplaces as an arena for establishing a common ground in the organization. Further, the Head of Communication from Company 2 highlighted the high degree of involvement as essential. Despite this, the respondents from three other companies elaborated on a variation in the establishment of circular economy in the culture throughout the organizations. The acknowledgment of the

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existing smaller cultures within the organization, where circular economy can be more clearly established, follows as subcultures (Jacobsen & Thorsvik, 2019; Malmi & Brown, 2008)

*“[...] I think that it is maybe a little different between the leaders how much it [circular economy, ref.] is ingrained. I think it is divided, where I have it very high up [as a priority, ref.] and have had it very high up [as a priority, ref.] for a very long time [...].”* (Head of Communication, Respondent 7, Company 4)

*“[...] People are engaged in different things [...] my impression is that it is an important goal for most people. [...] however, I have been to our own stations [recycling station, ref.] to throw waste and asked where this [waste, ref.] should be thrown, and (the worker, ed.) replies ‘whatever’ [...] how to motivate such people to [answer, ref.] ‘it should be thrown in that container’.”* (Head of Finance, Respondent 11, Company 3)

*“[...] It is important to use the employees as a highly essential and great resource. It is not just the management that sets the course, but it is something that everyone is involved with. We want to reach a goal, and everyone must participate.”* (Head of Communication, Respondent 3, Company 2)

As previous quotations have highlighted, companies emphasized that the incorporation of circular economy in the culture of the companies has taken place over several years and is a continuous process. The results show that the focus on establishing circular economy as a part of the culture increases when other organizational factors are established. This is elaborated on by three of the companies.

*“[...] now that the reorganization is in place, and everyone has been assigned to their tasks, then we must start actively to build up a strong culture again, with all that we know within sustainability and circular economy. So, it is natural that this is connected.”* (General Manager, Respondent 8, Company 5)

*“That is some of what we are going to start doing [to include circular economy in the culture, ref.]. We have not yet found quite the balance. But we are working with this moving forward.”* (Head of Finance, Respondent 11, Company 3)

*“[...] According to how we work, we think that if we have a strategic anchoring in place and make it visual for the employees, which are practical and understandable. So that it does not become too loose and so that we can connect the objectives afterward. Then they*

*can see how their action points and can influence the goals, in this way, they can see the common thread. This is a part of creating culture and understanding on its own, we believe.” (CEO, Respondent 10, Company 4)*

The theory of Malmi and Brown (2008) explains training as a function of cultural controls as it can conduct the culture in the organization (p. 295). An element highlighted by three of the companies that increases the anchoring of circular economy in the culture of the entire organization is to focus on the improvement of knowledge of the employees. According to the respondents, this results in an increasing interest of the employees and a better incorporation of the values of the companies.

*“An important aspect of that [culture, ref.] is to incorporate competence training and put together formalization, in other words, to get documented that they get a professional certificate and qualify for a professional certificate in what they already do. This will contribute so that the employees will become more active and interested in what we do, and they will get a better understanding of their own role in the bigger picture. That is an important part of building a culture [...].” (CEO, Respondent 6, Company 3)*

*“We have participated in something called (a program for organizations to learn about circular economy, ed.) together with (a council, ed.). Where we are a central part, and many of our employees have participated, not the ones in the operation of the organization, but many of those working with administration strategically have participated in (the program, ed.) to incorporate these [circular economy, ref.] values.” (CEO, Respondent 9, Company 5)*

## **Summary**

The results of the data collected indicate that circular economy is established in the culture of all the companies and correspondingly established in the values, visions, and norms of the companies (Jacobsen & Thorsvik, 2019; Malmi & Brown, 2008). Furthermore, all companies use values to direct the behavior of employees towards circular economy which is in accordance with the theories of Jacobsen and Thorsvik (2019), Kirkhaug (2013), and Malmi and Brown (2008). However, the answers of the companies can give indications of the institutionalization of value-based control through all three methods: recruiting, socialization, and explanation. Furthermore, respondents from all companies elaborated on the importance of achieving a cultural anchoring in the entire organization in the future and influencing the



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behavior of employees (Flamholtz, 1983; Jacobsen & Thorsvik, 2019; Malmi & Brown, 2008). However, some of the companies elaborated on the existing sub-cultures within the organizations where circular economy are more anchored. Lastly, three companies elaborated on the importance of using training of the employees as a control system to establish circular economy as a part of the culture, following the assertion of Malmi and Brown (2008, p. 295).

## 4.2 Planning controls

The following part will present the data related to the research question, “How are planning controls used towards circular economy in waste management companies in Norway?”. By taking the time to carefully understand how planning is used as a control system in waste management companies towards circular economy, it will contribute to answering our main research question.

### **The long-term planning towards circular economy**

Circular economy is a part of the long-term planning in all companies as it is incorporated into different strategies, which is in line with the literature of Flamholtz (1983) and Johanson and Madsen (2013). Circular economy is not necessarily included to a greater extent in the main corporate strategy of all companies. However, it is elaborated through other sub-strategies underlying the corporate plan. All the included companies operate with strategies surrounding circular economy that extend over four years, but one of the companies also includes an eight-year strategy. This is to be considered long-term planning in accordance with the theory of Johanson and Madsen (2013) as well as Malmi and Brown (2008), and in accordance with the previous statements, the planning has a more strategic focus. According to the companies, the plans set out objectives to be achieved in the long term and steer the behavior of the company in the direction they envision for the future.

*“We have a 10-year corporation strategy which is relatively comprehensive. It [the corporation strategy, ref.] does not include any specific goals according to material recycling and so on. [...] we create a four-year (waste strategy, ed.) [...] which includes concrete targets for material recycling which we operate and continuously measure on a monthly basis.”* (Head of “Relevant Department”, Respondent 2, Company 2)

*“In (a year, ed.), we adopted a strategy for the company, which was adopted together with the owner municipalities. This [the strategy, ref.] had some focus areas [...]. There were*

*five focus areas, and the first is connected to obtaining more waste for material recovery and reuse, according to the waste hierarchy, to obtain as much as possible of the activities and waste from landfill and energy [...].” (CEO, Respondent 6, Company 3)*

*“[...] we have an overarching corporate strategy, which is based on some given sustainability goals that affect us directly, and one of those goals, or several of them, is connected to circular economy, and becoming even more circular to develop circular value chains. It is one of the main focus areas in the overarching corporate strategy, which is valid from 2020 until 2024 [...].” (CEO, Respondent 9, Company 5)*

A common theme that emerged from the interviews with all companies was the long-term political objectives that affected the planning of circular economy in the strategic work. The EU is elaborated by every company as the driver for the long-term strategic planning of circular economy in the companies. The long-term objectives of the EU are aimed at 2035 and 2050, which according to the respondents, consist of strong requirements towards circular economy and sustainability. The provisions are incorporated into Norwegian law, and the waste management companies are therefore subject to them. This indicates that long-term planning is functioning as a control system as it exhibits objectives, such as the regulations by the EU. These objectives guide behavior as well as a defined level of effort that is expected of the employees based on clear objectives (Flamholtz, 1983; Malmi & Brown, 2008).

*“[...] when it comes to the waste field, it is very largely regulatory. The climate and environment minister called it a tsunami of climate and environment regulations that are coming now [...].” (CEO, Respondent 6, Company 3)*

*“Our objective is that we are going to material recycling 65% of all the waste by 2035, this is a long-term European goal. [...] So there are a lot of demands from the EU that are implemented in Norwegian law that we have to follow up on [...].” (CEO, Respondent 5, Company 1)*

*“[...] In other words, the point of departure on our objective requirements is a result of both international and national regulations [...].” (Head of Communication, Respondent 7, Company 4)*

One of the main elaborations throughout the interviews was the effect of the waste hierarchy on planning controls in all companies. The hierarchy created clear objectives directing the

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behavior towards circular economy and is incorporated into the strategies. Thereby, their strategies are used to plan for the achievement of a higher degree in the hierarchy by clarifying the behavior necessary to achieve it. Through the objectives and required performance level concerning the hierarchy being implemented in the plans, circular economy is a part of long-term planning in the companies and operates as a control system (Flamholtz, 1983, p. 159). Furthermore, this complements the elaborations of long-term planning by Johanson and Madsen (2013), as it is a strategic plan directed by the organizations (p. 19).

*"[...] We work based on a waste hierarchy where it is necessary to avoid getting a lot of residual waste, as the first priority in a way [...]." (CEO, Respondent 9, Company 5)*

*"[...] In practice, we try to reduce the amount which previously was put in the landfill. We then find other downstream solutions to it, which means that we raise it in the [waste, ref.] hierarchy [...]." (Head of Operations and HR, Respondent 4, Company 3)*

As the interviews indicated, there has been a difference in whether the companies have decided to include circular economy as a part of their corporate strategy. From the interviews with two of the companies, it has emerged that they are preparing a separate sustainability strategy. The respondents indicate that this strategy will not only contain circular economy but will have a broader sustainability focus. Circular economy, however, will be included as one of the focus areas in the strategy. The two companies emphasize their point of view on whether the strategy will be an independent strategy or subordinate to the corporate strategy of the company in the future.

*"[...] we do not have our own sustainability strategy, but we will have one within a year. [...] the work [with the strategy, ref.] is not finished yet, but my personal opinion is that it [the two strategies, ref.] is not separated. That would be strange. We are not going to report on sustainability and another activity, we are going to have a sustainable activity [...]." (CEO, Respondent 10, Company 4)*

*"We have a corporate strategy and are going to create a sustainability strategy. [...] We probably talk more about sustainability than just circular economy, so these terms are probably a bit intertwined. Considering that we are going to create a sustainability strategy, this term is closest to us. But the corporate strategy and the sustainability strategy must be well connected, however, we have chosen to create our own sustainability strategy."*

*You could imagine that the corporate strategy should contain sustainability, right? Maybe we will get there sometime [...].” (General Manager, Respondent 8, Company 5)*

Furthermore, in the creation of new corporate strategies, the companies emphasize how it is important to take into consideration the change in surroundings and the development of circular economy as a concept. This is because new objectives are required to successfully direct behavior towards circular economy, which emphasizes further the use of planning as a control system (Flamholtz, 1983; Malmi & Brown, 2008).

*“[...] we are now embarking on a new strategy process [...]. We will base something on this [previous strategy, ref.], but quite a lot has happened within the circular economy since (the year the strategy was created ed.), so we will probably be even more critical in relation to what we can contribute towards waste reduction, the part of the circle that is before it [the waste, ref.] comes to us.” (CEO, Respondent 6, Company 3)*

*“It [the strategy, ref.] has been a bit old-fashioned then, where the strategy has been about being [REDACTED] [REDACTED]. Now we see that more and more of [REDACTED] is about being able to offer sustainable and circular solutions for managing domestic waste, so we are in the middle of a work where we fill our strategy with new sustainability content [...].” (CEO, Respondent 10, Company 4)*

Furthermore, these two CEOs expressed that the strategic long-time work is about enhancing the companies for future circumstances. Although the circumstances of today consist of a monopoly for the companies, the CEOs elaborated that this state is not necessarily permanent. Now when new strategies are drawn up, there is an underlying thought about being prepared for future possible changes.

### **Action planning towards circular economy**

Planning towards circular economy in the companies also consists of short-term objectives and actions. This is to ensure that the long-term goals are achieved and elaborated in the day-to-day business. This supports the literature of Malmi and Brown (2008) and Johanson and Madsen (2013) that action planning has a more tactical focus and entails goals for the near future. How the companies carry out action planning varies to some extent. The development of action plans or strategies for one year time is consistently stated by four of the companies, which is considered short-term planning since it is for the near future (Malmi & Brown, 2008,

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p. 291). These plans are according to the companies carried out from the long-term strategy. Through this, the planning becomes more operational and concrete in the day-to-day business and thereby clarifies the expected behavior of the employees in accordance with the plan (Malmi & Brown, 2008, p. 291).

*“[...] we have a four-year waste strategy that we work according to. And that is very good because we also have a communication plan that is in line with the waste strategy. [...] The waste strategy consists of initiatives and action plans. The communication plan divides the concrete measures that appear in the waste strategy. So thereby, we have more direct directions, what are we going to take a chance on? Which stakeholders are there, for example? [...] So it is more concrete when we divide it down into specific things that we will achieve in the next four years to get, for example, increased material recycling.”* (Head of Communication, Respondent 3, Company 2)

*“In the corporate strategy, we have annual business plans, which focus on our six focus areas and create targets each year in relation to the business plan. [...] we have a strategy hierarchy consisting of the corporate strategy, annual business plans, and a separate strategy for the part exposed for competition. [...] But every year, we have business plans where we divide it [the corporate strategy, ref.] down on a shorter basis [...].”* (CEO, Respondent 9, Company 5)

On the other hand, Company 1 emphasized how they do not establish strategies with a shorter perspective and, by that, action plans. The company rather allocates the overall long-term plans to each manager based on what affects their operations. By doing so, the plans are divided throughout the organization. Thereby, the manager can ensure that day-to-day operations are in accordance with long-term strategic plans. Malmi and Brown (2008) state that this coordination of goals can control the activities of groups and individuals so that they are in line with the overall objectives of the organization (p. 291).

*“The objectives we get now [from the EU, which is then implemented in Norwegian law, ref.], are divided internally all the way down to the individual employee, so everyone takes a piece of the pie. [...] If we are going to achieve those objectives, we have to sort [the waste, ref.] better, but then the whole value chain has to work [...].”* (CEO, Respondent 5, Company 1)

Two other companies also contend that each manager has responsibility for a part of the overall strategy. However, these companies also drew up a short-term strategy, in which the long-term strategy is decomposed.

### **Summary**

As elaborated by the respondents from all companies, planning is used regarding action- and long-term planning towards circular economy (Johanson & Madsen, 2013; Malmi & Brown, 2008). Furthermore, the respondents highlighted how there are created long-term plans regarding circular economy used to direct the effort and behavior of the employees (Flamholtz, 1983, p. 154-156). Both the waste hierarchy and the new regulations of the EU are pointed out as elements incorporated in the long-term strategies which create clear objectives for the behavior (Malmi & Brown, 2008, p. 291). Regarding action planning, four companies develop a one-year plan directing behavior regarding the work towards circular economy. This plan decomposes the long-term plans, so it is better incorporated into the day-to-day business by creating goals within the following year. This enables the coordination of behavior throughout the organization in line with the corporate strategy towards circular economy (Johanson & Madsen, 2013; Malmi & Brown, 2008, p. 291).

## **4.3 Cybernetic controls**

This section will elaborate on the data collected regarding the third research question, which is “How are cybernetic controls used towards circular economy in waste management companies in Norway?”. Firstly, the chapter will have an in-depth view of the answers of the respondents about the use of budgets in the five companies investigated, followed by non-financial measurements, and financial measurements.

### **Budgets**

Circular economy is included in the budgets for all the companies participating in this study, however, they explain that circular economy is not included as an own activity but through other activities in the budget. Two companies explain this because the overall objectives of the organization have an impact on the budget, and therefore circular economy has an effect through different activities. The quotations emphasize that the budgets are used in line with the strategy and objectives of the companies to plan for desired performance (Hansen et al., 2003; Hoff & Helbæk, 2021; Malmi & Brown, 2008). This indicates that the budgets operate as a control system towards circular economy as it focuses on planning for activities,

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acceptable behavior of the employees, and evaluating the performance in accordance (Malmi & Brown, 2008, p. 293).

*“[...] that [circular economy ref.] is not a term we include in our budget. [...] but we focus on reuse and circularity, and therefore it will influence the budget for 2023, already in 2022. Since we turn the focus to reuse, it will affect the budget. Because if we are going to realize new concepts of reuse and make our service offering available so people can use it obediently with sustainability and a circular economy, it will have an effect on the budget. Thereby, you will be able to see it in the budget, but not as an own activity for circular economy.”* (General Manager, Respondent 8, Company 5)

*“[...] we need to deliver on our main goal of material recycling and on reuse, however, we do not have any climate budget. [...] We are at the point where we are looking at everything we need to improve. And then we need to see [...] how much it will cost us and how we need to adapt the operation to make it happen. Or out to the customers, because some measures may not cost that much, but there are big changes involved with each individual household [...].”* (Head of “Relevant Department”, Respondent 2, Company 2)

Furthermore, the Head of Finance of Company 3 elaborated that circular economy is a consequence of the budgets rather than included in the budget. The respondent highlighted how the operations in the organization impact the budgets. Additionally, the CEO of Company 3 pointed out that the strategy provided the basis of the budgets, and the budget operates as numerical action plans towards circular economy (Hoff & Helbæk, 2021, p. 26-27). Further, the CEO elaborated on the challenge of using the budget as a control mechanism when activities necessary to achieve the strategy towards circular economy are further away from the regular operations. For example, budgeting for more bins for sorting is possible but incorporating activities for increased sorting and waste reduction at the upper level of the waste hierarchy is more challenging. This indicates some limitations of using the budgets as a control mechanism towards circular economy, as it is necessary to evaluate the performance of the plan (Hansen et al., 2003, p. 96).

Moreover, the CEO of Company 4 elaborated on the function of the budget as a control mechanism in relation to circular economy, as the budget is used to direct the performance and, thereby, the behavior of the company by adding cost to activities aligned with the strategy. Similarly, the CEO of Company 1 underlined how the budgets, in many ways, are the ones

determining the plan for the following year. These three companies answered following the two previous companies, as the budget as a control mechanism regarding circular economy is used as a tool for planning (Hansen et al., 2003; Malmi & Brown, 2008). Despite some limitations highlighted by the one company.

*"[...] We are municipal in the sense that we have a budget that must be approved by the owner municipalities. At a detailed level, the strategy has been the basis for our budget processes. [...] So the strategy is pretty much the basis for the budget, but to identify and come up with good objectives to operationalize it into a budget becomes more difficult when you are further away from the core business or what we do on a daily basis [...]." (CEO, Respondent 6, Company 3)*

*"Yes, there are included activities, which previously have been called environmental projects, which now are included as a part of becoming more sustainable. So that includes building up and sorting out food disposal and establishing downstream solutions, which all have a cost. We also include an increased cost in incineration tax. As well as we add costs associated with building a sorting facility in order to get more material recycling and other types of activities." (CEO, Respondent 10, Company 4)*

The Head of Communication informed how Company 2 has different social responsibility measures regarding reuse and recycling, which might have a higher expense for the company, but help them reach a higher level in the waste hierarchy. The respondent highlighted that these measures must be considered when the budget is being made. By contemplating these costs, the budget is used to control the performance, and direct the operations towards circular economy to be aligned with the plans of the organization (Hansen et al., 2003; Malmi & Brown, 2008).

*"We have for example a good number of things that we focus on in relation to social responsibility [...] it might be a higher expense, but we reach a higher level in the waste hierarchy. We get more credit for reuse or material recycling here [...], but it is a higher expense. [...] we set aside money for that [in the budget ref.] to increase reuse, material recycling instead of energy recycling and landfilling." (Head of Communication, Respondent 3, Company 2)*

### **Non-financial measurements**

In the annual reports of last year, it also appeared that all the companies have various non-



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financial measurements carried out following the work towards circular economy. According to the companies, the non-financial measures enable the company to follow the development of the activities by the waste hierarchy and make changes if necessary. The non-financial measurement provides information on the quality and the ability of the operations to detect unwanted development (Ittner & Larcker, 1998, p. 217-218). The companies highlighted material recycling rates as one of the non-financial measurements used to measure the operations towards circular economy. Consequently, higher numbers of material recycling are expressed as desirable for the companies, as it entails more waste being recycled versus remaining at lower levels of the waste hierarchy. Thereby, the operations of the company are more aligned with the principles of circular economy.

Further, the companies measure total waste collected and how it is treated according to the levels of the waste hierarchy in terms of material recycling, incineration, and landfill. Two companies also pointed out an analysis conducted to investigate whether the waste is being sorted incorrectly to see where any measures to improve sorting should be implemented. As the respondents elaborated, the non-financial measurement allows the companies to adjust their behavior and performance according to work towards circular economy by using the results as feedback into the system of the actions (Ittner & Larcker, 1998; Malmi & Brown, 2008).

*“[...] on the material recycling, we have concrete numbers on the various types of waste. We collect and add up the numbers and follow the development in the waste hierarchy on how far we have come, such as material recycling inclusive reuse, and we also separate those two numbers. It is important for us regarding reuse, as it is the upper level in the waste hierarchy [...].”* (Head of Communication, Respondent 7, Company 4)

*“The most important for us is the waste hierarchy, and we divide it into percentages, kilos, and numbers so we can look at it [the development towards circular economy, ref.]. Thereby, we can differentiate between reuse, material recycling, energy recovery, and landfill. Here we have a lot of KPI reports, we have monthly reports where every member of the organization becomes familiar with them [the KPIs, ref.], and it becomes a part of the subconsciousness [...].”* (Head of Communication, Respondent 3, Company 2)

*“[...] it is important that we manage to sort out and increase the material recycling, and we are now working on increasing the degree of sorting [...].”* (CEO, Respondent 9, Company 5)

Four companies stated in their annual report that they have non-financial measurements regarding reuse. In the interview with the last remaining company, it was elaborated that they are in the process of developing non-financial measurements regarding reuse. Thereby, all the companies either have or will have measurements on reuse. By including non-financial measures higher up the level of the waste hierarchy, the management is moving towards circular economy (Ranjbari et al., 2021, p. 2). This gives further indications of the use of non-financial measurements towards circular economy as a part of the cybernetic controls in all companies (Ittner & Larcker, 1998; Malmi & Brown, 2008). Regarding the upper level of the waste hierarchy, waste reduction, the CEO of Company 4 pointed out how this also is a focus. As appeared in the annual report of the four other companies, they also include measurements regarding waste reduction. From the interview with the CEO of Company 5, it is emphasized how waste reduction and ensuring that products do not become waste is one of the essential elements they can do towards circular economy.

*“[...] we measure the degree of material recycling in relation to what we collect and what ends up in landfill and measure how much we get for waste reduction in the municipality every year. [...].”* (CEO, Respondent 10, Company 4)

Regardless of the several respondents elaborating on the existing non-financial measurements, two of the companies highlighted the consistent work on improving the key performance indicators (KPI) and measures in work towards circular economy. Cybernetic controls is seen as a feedback loop, and the continuous work on measurements is obedient to how cybernetic controls are used as a management control system (Green & Welsh, 1988, p. 289).

### **Financial measurements**

As the business of the companies is based on the economic model of the self-cost principle, several of the respondents answered that the economic focus is on reducing the waste fee. With the self-cost principle model, it is elaborated that the business must break even, and the residents cover the entire cost of collection and treatment of waste through the waste fee (Meld. St. 45 (2016-2017), p. 20). All the companies informed how they compare their fees with companies in other municipalities, or experience pressure from owners to have the lowest

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fee. As elaborated by the respondents, the financial measurements as the waste fee, perform as a control system because it enables comparison between companies, which further can direct the behavior of the organization (Ittner & Larcker, 1998; Malmi & Brown, 2008).

*“The most primitive thing is that household renovation is financed by a waste fee that each individual homeowner pays. That fee varies from municipality to municipality, and then we are, of course, compared to other municipalities, and that is because it is a self-cost area, which means that the residents must pay what it costs to produce the service. [...] We are a separately funded area. We are not exposed to competition, however, we are exposed to political pressure to keep the fees down, but we are not exposed to competition with other companies to be as efficient as possible. Therefore, a benchmarking scheme is established where we try to compare our cost-effectiveness with other companies. And then we try to document the cost of the different elements of our offer.”* (CEO, Respondent 6, Company 3)

Four of the companies elaborated on a connection between the waste fee and non-financial measurements. Despite this, none of the respondents elaborated on using hybrid measurements, for example, balanced scorecard, towards circular economy (Ittner & Larcker, 1998; Malmi & Brown, 2008). The connection between non-financial and financial goals is explained by the companies that households obtain a lower fee if they have a higher degree of recycled waste. This is because there are markets for selling sorted waste, and the company can therefore sell this and consequently receive an income. In this way, waste disposal companies reduce their costs, which results in lower waste fees for households.

*“We charge a price for both paper and cardboard, which means that there are lower costs for households and businesses, which makes it more worthwhile to sort [the waste, ref.]”* (Head of Operations and HR, Respondent 4, Company 3)

*“[...] we basically have many measurements, and we have agreements with many material recycling companies, such as (a material recycling company, ed.). If we sort, or our residents, sort poorly, we get a deduction, a penalty rate. Because we do not get that much money for delivering (a type of waste, ed.) if the quality is not good. Then we have to investigate what we can do in advance to sort out more of what we receive [of waste, ref.], but as well, what can we do to get our citizens to sort better [...].”* (Head of Communication, Respondent 3, Company 2)

Although there is a focus on having the lowest fee, the companies differ in whether they use financial measurements in their work towards circular economy. Only one of the companies stated that it operates by adding a price per ton on waste, and this constantly connects the work regarding circular economy with financial measurements.

*“The material recycling percentage stands for itself and does not provide info about how much it costs. But we are now adding tons of value on more of what we do and thereby connecting it [Financial measurements and non-financial measurements, ref.] more.”*  
(CEO, Respondent 2, Company 2)

Despite the link between the fee and non-financial KPIs, four companies elaborated that there is limited use of financial measurements towards circular economy. This is explained as the companies find it challenging to prepare well-suited financial measurements. This is in accordance with the research by Crutzen et al. (2017), who found limited use of financial measures in the work of sustainability (p. 1296). Thereby, there is an ongoing process in three companies to create financial measurements related to circular economy. The companies explain that another possible reason for the limited use of financial measurements is related to that they operate based on the self-cost principle and must thereby break-even. One of the companies also pointed out the conflicting incentives with the current self-cost principle model and circular economy. This because the companies earn money by collecting waste, on the other hand, circular economy is about less waste being created.

*“We are a company that must break even every year since we are a (publicly owned company, ed.). But it's clear, we must make the service as good and as cheap as possible. But we don't have any specific financial measurements for that [circular economy, ref.]”*  
(Sales Manager, Respondent 1, Company 1)

*“[...] no, so that is also part of the work that is being done now. That we modernize the KPIs so that finance is linked to activity to a more detailed degree than just at the upper level as how many kilos of waste we have collected for the millions we received.”* (CEO, Respondent 10, Company 4)

*“[...] It is about doing things in the cheapest possible way, [...] so there are actually no economic incentives in the current economic model linked to thinking reuse. When we have created objectives regarding reuse [...], in a way, we cannibalize our own business [...]. We make money by bringing in as much waste as possible, and the more waste, the more*

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*you pay, both from households and from the industry, but it [circular economy, ref.] is more about reuse and reducing waste [...].” (CEO, Respondent 9, Company 5)*

Although several companies elaborated that it is common to compare the waste fee, two of the companies highlighted a challenge regarding comparing numbers and KPIs from different waste management companies. According to companies, there is no common standard for various measurements and KPIs for companies in the industry. In the exercise of cybernetic controls, an extensive part consists of comparing performance to standards and accordingly can be challenging to detect unwanted variances and modify the behavior (Malmi & Brown, 2008, p. 292). The respondents elaborated that the results of this are that companies operate with quite different measurements, despite it having the same name, based on how the company chooses to calculate it. The absence of standards used to detect undesirable variances and make adjustments causes the companies to compare measurements to their numbers before making adjustments (Green & Welsh, 1988; Ittner & Larcker, 1998).

*“[...] It is clear that [finding good measurements, ref.] is one of the most difficult things in our industry. We almost always have to compare the numbers to ourselves because the industry has statistics that cannot be trusted because we report in so many ways. So, if we are going to compare ourselves with (other companies, ed.). Will some of the numbers be possible to compare, but then there are always some things where you report in a completely different way [...].” (Sales Manager, Respondent 1, Company 1)*

## **Summary**

As respondents elaborated, all companies consequently use budgets as one of the control systems towards circular economy by including extra costs in different activities necessary to achieve the goals. Thereby, the budget function as a plan that facilitates and evaluates behavior according to the defined objectives towards circular economy (Hansen et al., 2003; Hoff & Helbæk, 2021). However, one of the companies elaborated on some limitations of using the budget as a control mechanism towards circular economy, as there are difficulties in measuring some of the activities. All companies use non-financial measurements as control systems to control and direct behavior towards circular economy by measuring the operations and followingly adjusting behavior (Ittner & Larcker, 1998; Malmi & Brown, 2008). On the other hand, companies expressed a limited use of financial measurements to control performance towards circular economy.

## 4.4 Reward and compensation controls

In this section, the data related to the following research question will be presented: “How are reward and compensation controls used towards circular economy in waste management companies in Norway?”. Based on this, there has been gathered information from the respondents on the topic of reward and compensation controls in their organization and the operation of these control systems. In addition, the respondents were asked to elaborate on how the employees are motivated in the work towards circular economy. According to data collected, this chapter will be divided into two parts, extrinsic incentives and intrinsic incentives, as these are natural sections of the answers of the respondents.

### **Extrinsic reward**

There is a common agreement among the respondents that monetary rewards are not used to motivate employees in the work towards circular economy. Thereby, extrinsic rewards are not used as a control system towards circular economy in any of the included companies (Bonner & Sprinkle, 2002; Flamholtz, 1983). Based on the answers of the respondents, there are no indications that such incentives are considered to be introduced to motivate employees. During the interviews, we received two possible explanations as to why extrinsic rewards were not used. One of the explanations concerned that the operations of the company were required by law, and the other was about the company having public owners.

*“No, there is no bonus system in a company such as ours [...], so there is no money included.” (Sales Manager, Respondent 1, Company 1)*

*“No, we do not have that [bonus, ref.], and I neither believe we are going to have it either. We are operating a company with an important social mission, so everyone has important tasks, so I find it wrong to reward someone more than others for the work they are doing. To operate domestic waste is required by the law, so I do not believe we are going to have it [bonus ref.]. No, not at least in a way where someone is rewarded more than others.” (General Manager, Respondent 8, Company 5)*

### **Intrinsic reward**

In the interviews, the respondents were asked what motivated the effort of employees, either concerning the direction, duration, or intensity of the work towards circular economy. As monetary rewards were not used in any of the companies, the respondents elaborated on other rewards being used by the company to direct and motivate the effort of the employees towards

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circular economy. This as all companies emphasized that motivation is an important element in the work towards circular economy, which is in line with the theory of Jacobsen and Thorsvik (2019), who emphasized that the motivation of employees is a crucial element for the company to achieve their objectives (p. 228). Different non-monetary rewards were highlighted by the respondents as elements used to increase motivation and performance in accordance with the objectives of the organizations towards circular economy (Jacobsen & Thorsvik, 2019; Malmi & Brown, 2008).

Three of the companies emphasized an intrinsic reward by rewarding organizational members regarding good results or contributions towards circular economy by giving attention within the organization. The employees can achieve recognition through attention at general staff meetings or on internal communication platforms, the organization serving cake, or applause. One of the companies also elaborated on how internal competition between the members of different departments provides an engagement to achieve the goals and plans towards circular economy. By linking effort to the task Bonner and Sprinkle (2002) state that this can impact performance in three ways, by directing the effort of the employees, the duration of the work regarding the task, and the intensity of the work (p. 304). Although it is not necessarily possible to indicate in which direction the behavior of employees was affected, based on the elaborations of the companies there are indications of there being an effect on the behavior.

*“[...] it is more that it is appreciated if you come up with good solutions and that it is brought attention to who has been working with it, so it is more as an internal thing [...].”*  
(Sales Manager, Respondent 1, Company 1)

*“[...] but it is probably more that we have (multiple, ed.) recycling stations and there is a pride when you work on the [recycling, ref.] station and can see that your [recycling, ref.] station is much better than other [recycling, ref.] stations, so we try to make it visible [for the employees, ref.]. And then, the operation managers also have to convince the employees that they have to shape up and see if there is a possibility to improve. So, it is clear, there is a bit of clapping and such when we increase material recycling, so we are raising encouragement about it in the organization as well because we have to work towards the EU's demands of increased material recycling [...].”* (Head of Communication, Respondent 3, Company 2)

*“[...] but celebrating what we achieve together is important. Because this is something we must achieve together as a company, all of us. [...]”* (General Manager, Respondent 8, Company 5).

Three companies elaborated on increasing the motivation of employees by bringing attention to the operations in a comprehensive aspect. Further, a motivational factor that is beneficial in the work towards circular economy is to direct attention to the social mission of the companies.

*“There are no incentives beyond the internal motivation and if you can envision that you are taking part in something bigger than your own weekdays and company.”* (CEO, Respondent 10, Company 4)

*“They basically work as a part of it [circular economy, ref.] already, so we are not going to motivate them to become a part of it, but for some employees, we experience that making it visible that they are a part of an important field, accordingly sustainable development, and circular economy, provides an extra motivation. By showing people the broad aspect, it motivates not all, but many.”* (CEO, Respondent 6, Company 3)

Respondents from three of the companies elaborated on the focus on improving the knowledge of the employees as an element that increases their motivation. One of the companies contended that this is because some employees are doing the same operations today as they did previously, despite the increased focus on circular economy within the company. By improving their knowledge and thereby getting a greater understanding of their work in an enhanced value chain, the work becomes more rewarding. In accordance with Jacobsen and Thorsvik (2019), internal rewards such as education can motivate employees by meeting a higher level of Maslow's pyramid (p. 232-233). Two companies pointed out that establishing “why” the business operates as it does, increases the motivation to work towards circular economy and emphasizes the necessity of each employee understanding the overall organizational operation.

*“[...] then there are probably many of those who work on the recycling stations that are doing the exact same [work, ref.] today, as they did a year ago, but since the company is going to think more about new value, reuse, and repair, and who we can collaborate with and how we can use our areas differently. It will be important to gain an understanding and an anchoring of those out there [employees in the organization, ref.] [...].”* (General Manager, Respondent 8, Company 5)



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Furthermore, in relation to training, respondents from Company 3 elaborated that because the organization offers to improve the knowledge of the employees, the company becomes more desirable to be a part of for the employees.

*“[...] we are an industry that traditionally recruits a lot of uneducated labor and many with a diverse background. [...] We have used a lot of resources to formalize the competence that people have in the form of being employed and working in a field, but do not have any documentation of the competence, but then you can as a part of your job and during working hours get qualified to get a certificate of completed apprenticeship. Which is a part of increasing the reputation of the employees and increasing the wage. But we see that we get people who take pride in their work and become more independent and are ready to make decisions and dare to take more place since they have a certificate of their knowledge. It is not like a bonus in the finance industry, but it is still a form of boost” (CEO, Respondent 6, Company 3)*

### **Summary**

The results from the interviews are similar across the companies as rewards and compensations controls are used to a minor degree towards circular economy, as no one uses monetary reward to create incentives and control the behavior (Bonner & Sprinkle, 2002; Flamholtz et al., 1983; Malmi & Brown, 2008). However, the companies elaborated on focusing on intrinsic rewards to increase the motivation and performance of employees who behave in accordance with the objectives of the organizations. By establishing compliance between behavior and the aim towards circular economy through different intrinsic rewards such as improving knowledge or giving attention, the effort direction, duration, or intensity can be improved (Bonner & Sprinkle, 2002; Malmi & Brown, 2008).

## **4.5 Administrative controls**

In this last section, we will present the data regarding the research question, “How are the administrative controls used towards circular economy in waste management companies in Norway?”. By carefully considering all the answers of the companies, a precise understanding of how administrative controls is used in waste management companies can be achieved.

### **Organizational structure**

As the framework of Malmi and Brown (2008) states, the design and structure of the

organizations can be used as a control system (p. 293). Three of the companies pointed out during the interviews how there is a separate department within the organization, with circular economy as one of their responsibilities. In addition, one of the other companies elaborated on the ongoing process of creating a department with this responsibility. Thereby, four of the five included companies will have a separate department of sustainability where circular economy is one of the areas of responsibility, which corresponds with previous research by Crutzen et al. (2017). This is argued by Flamholtz (1983) to function as a control device, as having a separate department can facilitate specialization and thus can create control and desired behavior throughout the organization (p. 158). By using the organizational structure to emphasize the work towards circular economy through having separate departments, it contributes to the ability to control behavior (Alvesson & Kärreman, 2004; Flamholtz, 1983). Furthermore, the respondents explained that the work towards circular economy affects all departments in the company as it influences the operations of the entire organization.

*“[...] I would say that it is (a department ed.) that is responsible, but this [circular economy, ref.] affects all departments because we are very concerned with material recycling goals and the waste hierarchy. [...] the formality, however, is in (the department ed.) [...].”* (Head of Communication, Respondent 3, Company 2)

*“We have a department that coordinates the aspect of environment and sustainability. Among other things, it is about that we have several permits that we have to deal with [...]. But we have a (department, ed.) that has coordination responsibility for sustainability.”* (CEO, Respondent 6, Company 3)

*“We have an ongoing organizational development project [...] where we work towards finding someone who has responsibility in relation to sustainability and customer orientation in relation to sustainability [...].”* (CEO, Respondent 10, Company 4)

As accounted for, four companies operated with a separate department containing the responsibility for circular economy, among other responsibilities. In the last company, they have organized the work towards circular economy to be a part of the already established management group that consists of leaders from different departments in the organization. Each of the leaders has the overall responsibility for the goals towards circular economy and to incorporate the work into their departments. Thereby, the objectives are incorporated into the operations of the organization.

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*“[...] each of the leaders has a big responsibility for the objectives. With us, it is the operations that matter, so all the support functions as HR, economy, communication [...] support the objectives that we must achieve and support that the operation must be arranged towards them [...].” (CEO, Respondent 5, Company 1)*

Thus, it emerged from the results that the organizational structure as a control system, to a greater extent, consists of companies having a separate department with the responsibility of circular economy. Regarding decision-making in relation to circular economy in organizations, four of the companies emphasized that the decision-making is the responsibility of the management group. Thereby, the managers can control and direct the behavior of the employees throughout the different departments of the organization (Flamholtz, 1983, p. 159). The Sales Manager from Company 1 further emphasized the opportunity each department of the organization has of submitting ideas to the management group regarding circular economy.

*“[...] And we have our own upper management group that handles all the important proceedings, and all strategic important proceedings must be anchorage in the upper management group [...].” (CEO, Respondent 9, Company 5)*

*“[...] we have a management group on the top of the organization which consists of representatives from central departments. This is the strategic coordination group that must anchor things up to the board and out in the organization, the actions we decide to implement, and our objectives and values [...].” (CEO, Respondent 6, Company 3)*

*“[...] there is a management group in (the organization, ed.) which controls most of the company. So, it [decision making ref.] can go two ways, it may be that the management group challenges certain departments [...], or it may be that the departments notice that something has to be done. [...] and it is the management group that decides on what to do with this. And it is (the CEO, ed.) who ultimately decides, and in some cases, things are brought up to the board [...].” (Sales Manager, Respondent 1, Company 1)*

The last remaining company elaborated on how decision-making is a part of the department with the main responsibility of sustainability and circular economy. Furthermore, three of the companies also emphasized the role of the board and owners in the decision-making process.

### **Ownership structure and corporate governance**

All companies included in the research are publicly owned by different municipalities, and as presented in chapter 2.5.1, various formalities exist for such companies. In this chapter, however, the following research question is regarding the administrative controls, including the effect of board and owners towards circular economy. All information regarding the differences that may occur in boards because of different organizational forms is anonymized.

All companies elaborate on governance structure being used as a control system towards circular economy, however, there are some variations between the companies. The increasing interest from the owners in the work towards circular economy is repeated among the companies. Two of the companies elaborated that the strategy of the companies is aligned with the requirements of the owners regarding circular economy, and thereby, enables the ability of owners to control the behavior of the company. Furthermore, four of the companies elaborated that the requirements of the owners come through different public documents or strategies. The companies highlighted how the requirements of these documents often are a result of input from the companies themselves but are finally decided on by the owners. By that, the companies, to some extent, have an impact on the requirements, which also enables coordination of the behavior between the administration and the owners of the companies (Abernethy & Chua, 1996; Malmi & Brown, 2008). As mentioned previously in cybernetic controls, two of the companies also pointed out how the pressure of the owners to keep the waste fee down further directs the behavior of the company (Abernethy & Chua, 1996; Malmi & Brown, 2008).

*“[...] when the waste plan is being decided on, it also is introduced to the (owners, ed.) so it is us [the company, ref.] who comes up with the suggestion, and the (owners, ed.) who adopts the waste plan, [...] so it is a cooperation between the administration [of the company, ref.] and (owners, ed.).” (Head of Communication, Respondent 3, Company 2)*

One respondent also elaborated on the conflicting interest of the requirements from owners regarding circular economy, where they try to balance between both being able to decrease the fees and taking environmental considerations into account. According to the function of the board in the work towards circular economy, two companies elaborated that the board consists of following up on the requirements of the owners regarding circular economy. Furthermore, the results are more divided regarding the function of the boards in the aspect of circular economy. One of the companies has elaborated that the board will have a more

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important role going forward, whereas another company highlighted how the board always has followed the work towards circular economy. This may indicate that the boards have some control over the operations of the company towards circular economy, but as the respondents express, clear requirements from the different documents come from the owners (Malmi & Brown, 2008, p. 294).

### **Procedures and policies**

Respondents from all the companies emphasized that circular economy is a part of the procedures and policies of the company. By including circular economy in rules and policies, the behavior of the employees is constrained to act in accordance with this. Thereby rules and policies are used as a form of control system towards circular economy (Kristoffersen, 2014; Malmi & Brown, 2008). There are emphasized different kinds of procedures and policies in the interviews with the respondents. Two of the companies mentioned how the strategy has affected internal governing documents, whereas three of the companies drew more attention to the effect of external policies of circular economy affecting internal procedures and policies. However, the respondents agreed that the procedures and policies are used as a guiding tool in the work towards circular economy.

*“There are waste regulations, legislation, and permits, so we have a standard procedure that has been drawn up by the waste industry. And this is incorporated through our quality system. All employees know their duties well and know the upstream and downstream. And where waste comes from and where it is sent.”* (Head of Operation and HR, Respondent 4, Company 3)

All the companies elaborated that external procedures and policies consist of clear requirements and have an extensive effect on the operations of the organization, which are in line with the explanation by Kristoffersen (2014) of how external rules affect companies (p. 31). The companies stated that external policies and procedures come from Norwegian law and the EU.

### **Summary**

According to the organizational structure, four of five companies operate with a separate department where circular economy is one of the main responsibilities, and thereby the organizational structure is used as a control mechanism (Flamholtz, 1983; Malmi & Brown, 2008). However, only one of the sustainability departments is assigned the decision-making

responsibility regarding circular economy. Three of the other companies elaborated on the responsibility of decision-making being assigned to the upper-management group. Furthermore, the owners are highlighted as important in the decision-making towards circular economy through establishing commanding documents. In accordance, the internal procedures and rules are used as a control system towards circular economy, with the effect of external rules (Kristoffersen, 2014, p. 31).

## 5. Discussion

This chapter begins with a discussion of the results in relation to the existing research on the studied phenomenon. In chapter 2.5, it was clarified that there was relatively limited research on the topic of management control systems from a sustainability and circular economy perspective. The existing research has mainly focused on separate parts of the management control systems for sustainability (Morsing & Oswald, 2009; Norris & O'Dwyer, 2004; Riccaboni & Leone, 2010). Despite this, a few previous studies exist on how sustainability is incorporated into management control systems (Maas et al., 2016, p. 237). We desire to contribute to filling the existing gap in the literature by investigating how management systems are used towards circular economy by researching the use in waste management companies. Furthermore, the chapter contains the practical implications of the research and the limitations of the research. The last part of the chapter comprehends ideas for future research.

### 5.1 Theoretical implications

In this chapter, there will be a discussion of the results presented in chapter 4 compared to the findings of existing research on the phenomenon. The chapter is structured based on the theoretical framework presented in chapter 2.6.1. This because the theoretical framework has formed the foundation of the research along with the five research questions, which, when combined, provide an answer to the main research question of the thesis.

Two studies will be consistent in answering the theoretical implications, where both studies are using the theoretical framework of Malmi and Brown (2008) in their research. The study of Crutzen et al. (2017) concerns the use of management control in relation to sustainability, and the research of Svensson and Funck (2019) focuses on management control in circular economy. Both studies, with additions from a few other studies, will be used to clarify the theoretical implications.

#### **Research question 1: How are cultural controls used towards circular economy?**

As the results in chapter 4 demonstrate, there are some variations in how the companies use cultural controls as management control towards circular economy, as some of the companies elaborate on existing sub-cultures and the use of training to achieve the desired behavior. However, there are also similarities in the use of cultural controls, as all companies elaborate on the use of value-based control towards circular economy. Crutzen et al. (2017) detected in

their research that out of 17 companies, 10 of them had applied cultural controls as a part of their management control system towards sustainability (p. 1296). Furthermore, in the 7 remaining companies, Crutzen et al. (2017) find that cultural controls are used, but to a varying extent (p. 1296). We discover, in compliance with the research of Crutzen et al. (2017), how cultural controls are an aspect of all the management control systems of companies, where different aspects of cultural controls are being performed in the organizations (p. 1296).

All companies highlighted how circular economy is included in the values of the organization, and based on the results, there is a variation in how value-based control towards circular economy has been institutionalized. The elaborations of the respondents can be drawn in the direction of employees adopting the values through socialization, recruiting, or explanation. This can be seen in the context of what Crutzen et al. (2017) find in their study, as shared values are observed as one of the cultural controls used in their sample (p. 1296). Moreover, Svensson and Funck (2019) find in their research the importance of implementing the values regarding circular economy throughout the organization (p. 395). This appears as a focus for the organizations included in this study as well, as all the companies elaborated on how circular economy applies in the core operations of the company and is, therefore, the necessity of anchoring the values in the organization.

In addition, Crutzen et al. (2017) found that internal communication regarding sustainability was one of the standard cultural controls (p. 1296). This is in accordance with the result of our research, where several of the companies highlighted general staff meetings as an essential element of anchoring circular economy in the culture of the companies. However, Crutzen et al. (2017) further elaborate on results regarding the use of visual symbols for sustainability (p. 1296). The result of our research is dissimilar as symbols were limited expressed by the respondents. However, our findings regarding visual symbols are in accordance with the study of Corsi and Arru (2020), where they find symbols to be required to a limited extent required regarding the encouragement of the sustainability goals of the companies (p. 40). Furthermore, the results from the latter research show that the education of employees is essential to establishing sustainability as part of the organizational culture (Corsi & Arru, 2020, p. 40). This coincides with our results, where three companies elaborated on how training is critical to anchoring circular economy in the corporate culture.

All this combined can indicate cultural controls being used as a control mechanism in the included waste management companies towards circular economy. These findings of cultural



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controls as essential control systems towards circular economy are in accordance with what Morsing and Oswald (2009) found in their research that the culture of the organizations is a crucial element in implementing sustainability strategies (p. 94). Johanson and Madsen (2013) also found in their results indications of cultural controls as the most critical management control to manage the behavior of the employees (p. 21). However, the research of Johanson and Madsen (2013) did not consider either sustainability or circular economy (p. 18)

**Research question 2: How are planning controls used towards circular economy?**

As presented in the results in chapter 4.2, all the companies include circular economy in their planning through action- and long-term planning. Regarding long-term planning, our findings indicate a difference between whether the companies have decided to include circular economy explicitly as a part of the corporate strategy or not. However, all the companies elaborate that circular economy is included in their strategic work, either through separate strategies or as a part of the corporate strategy. This follows the research by Crutzen et al. (2017), where 15 of 17 companies have included sustainability in their long-term planning (p. 1295). Furthermore, the research finds that ten companies had incorporated sustainability in their strategic management procedure (Crutzen et al., 2017, p. 1295). Furthermore, there are some contradictions between the findings of Crutzen et al. (2017) and our results. All companies in our research elaborated on long-term planning, creating objectives to achieve in relation to circular economy, for instance, a higher degree of material recycling. On the other hand, Crutzen et al. (2017) find that companies, to a smaller extent, create explicit goals related to sustainability that are communicated in the strategy of the company (p. 1295).

Furthermore, in relation to the creation of objectives with the strategy of the organization, previous research has found that objectives developed and integrated with sustainability strategy can direct the effort and behavior of employees (Arjaliès & Mundy, 2013; Riccaboni & Leone, 2010; Svensson & Funck, 2019). The latter found that the strategic objectives of the organization are used in work regarding circular economy in long-term planning (Svensson & Funck, 2019, p. 395). Additionally, Riccaboni and Leone (2010) found that integrating sustainability strategy into objectives is essential for communicating and transforming relatively abstract principles associated with sustainability into concrete action that can be carried out in the organization (p. 135-136). Our research found that long-term political objectives affect the strategy towards circular economy in planning. The companies are subject to regulations from the EU as these are incorporated into Norwegian law. In addition, the results indicate that the waste hierarchy affects the planning regarding circular economy in the

companies, and they plan towards achieving a higher degree in the hierarchy. These objectives, combined when incorporated in long-time planning, direct the effort and behavior expected of the employees of the companies.

Furthermore, Svensson and Funck (2019) find in their research that companies decompose long-term strategic planning to set strategic objectives to establish action plans (p. 395). In compliance, four companies in our research elaborate that to achieve long-term goals for circular economy, the planning also consists of an action plan for the near future. This, however, contradicts the findings of Crutzen et al. (2017), who found that only seven out of 17 companies had created action plans in relation to sustainability (Crutzen et al., 2017, p. 1295). However, one of the companies in our research does not establish action plans and thereby is in accordance with the findings of Crutzen et al. (2017, p. 1295). On the contrary, they allocate long-term plans to managers of the departments affected by the plans. In this way, the manager can direct the effort and behavior of the employees so that the operations are connected to the long-term objectives of the company.

### **Research question 3: How are cybernetic controls used towards circular economy?**

Regarding how the companies use cybernetic controls towards circular economy, budgets, non-financial and financial measurements are emphasized by the companies. In relation to the use of budgets, all companies highlighted how it is used as a control system to direct behavior. This adheres to the research of Crutzen et al. (2017), where all companies applied performance regarding the environment in the budgets (p. 1296). However, one of the companies in our research pointed out a challenge of using the budgets as a control system, when the actions towards circular economy are further off their core operations. Furthermore, none of the companies include a separate activity of circular economy in the budgets, but it becomes visible through other activities. These findings relate to the research by Arjaliès and Mundy (2013), who found that companies had challenges in measuring the financial aspect of sustainability (p. 295). Therefore, separate corporate social responsibility budgets were not created, but additional funds were assigned to different operational units in the company (Arjaliès & Mundy, 2013, p. 201).

In the research by Svensson and Funck (2019), the results indicate that circular economy results in the development of new performance measurements (p. 396). This is equivalent to the results conducted in our research, where multiple respondents elaborated on the continuous work evolving financial and non-financial measures. However, in our research, four

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companies indicated a challenge regarding establishing good financial measurements connected with the work towards circular economy. Crutzen et al. (2017) find in their research a limitation in integrating sustainability performance with financial performance (p. 1296). This is equivalent to the findings of Epstein and Roy (2001), who found that the environmental impact is less clear and the connection to the financial measurements is challenging, therefore, they are often not included in the process of decision-making (p. 599). The findings of both Crutzen et al. (2017) and Epstein and Roy (2001) correspond with our research results, where one of the companies elaborates on the lack of economic incentives in the existing company forms. This also follows the findings of the previously presented research by Arjaliès and Mundy (2013), who found a challenge in measuring the financial advantage of sustainable and social measurements (p. 295). Furthermore, the latter research elaborates that the reason is due to a lack of comprehensive measurements (Arjaliès and Mundy, 2013, p. 295).

Accordingly, Corsi and Arru (2020) found in their research that formal tools were adopted by all the companies where the most popular were benchmarking, performance indicators, and budgets (p. 40). This coincides with the results from our study, where both budgets and measurements have been discussed in the previous section. Several companies also indicate that benchmarking is commonly used, especially regarding obtaining the lowest waste fee, thereby affecting the company towards circular economy. However, related to benchmarking of other measurements, two companies elaborate on a challenge as there are no standards for the industry to follow.

#### **Research question 4: How are reward and compensation controls used towards circular economy?**

Earlier research has found that rewards are rarely used as a management control system regarding sustainability (Arjaliès & Mundy, 2013; Crutzen et al., 2017; Johanson & Madsen, 2013). Arjaliès and Mundy (2013) and Crutzen et al. (2017) found that only a few companies applied rewards as a control mechanism for sustainable and social measurements to motivate employees. Johanson and Madsen (2013) conclude that reward and compensation controls is the least important control mechanism to direct the effort and behavior of employees (p. 21). Further, they point out that many companies struggle with making reward and compensation systems motivating for the employees (Johanson & Madsen, 2013, p. 25). Our results indicate that none of the companies has implemented monetary incentives to motivate their employees towards circular, which follows findings of previous research.

However, the findings in our research imply that the companies focused on motivating their employees in the work towards circular economy through intrinsic rewards. The companies had different focus areas on which intrinsic rewards were used to encourage behavior aligned with the objectives of the companies towards circular economy. One of the companies explicitly elaborated on the importance of internal motivation, whereas other companies focus on creating a feeling in the employees to be a part of something greater. Furthermore, four companies concentrate on rewarding the employees by highlighting good results or contributions towards circular economy for the entire organization. Our findings indicate that all the companies work on improving the internal motivation of their employees with an intrinsic reward. These findings follow the research by Crutzen et al. (2017), who found that the intrinsic motivation of employees is a reason why reward and compensation controls are not applied to work towards circular economy (p. 1296). This is also in compliance with the research of Rehman et al. (2019), where the findings indicate that there should be a focus on intrinsic rewards, otherwise, the performance of the employees reduces (Rehman et al., 2019, p. 19). However, the research of Rehman et al. (2019) does not address the use of reward and compensation controls in an aspect of sustainability.

Pérez et al. (2007) found that increasing training and awareness improvement will enhance the environmental knowledge and abilities of the employees, and raise participation and awareness related to environmental management (p. 405). In accordance with this, three of the companies included in our research use the improvement of knowledge and skills as a motivation for the employees and thereby as a part of the reward and compensation controls towards circular economy.

#### **Research question 5: How are administrative controls used towards circular economy?**

Previous research conducted by Crutzen et al. (2017) found that all the included companies had integrated sustainability into their formal structure by creating a separate department (p. 1296). Furthermore, in the research by Arjaliès and Mundy (2013) 34 out of the 36 companies had created a separate department responsible for the environmental and social strategy (p. 290). Corsi and Arru (2020) also found that all included companies in their research had established a sustainability department (p. 39). The findings of our research follow all these studies, as four of five companies have created a separate department with responsibility for circular economy and sustainability. This is further emphasized by Ditillo and Lisi (2014), who points out the organizational structure as an essential control mechanism in the context of sustainability (p. 34). Furthermore, Gond et al. (2012) highlighted the importance of

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incorporating sustainability in the formal structure of the organization, so it facilitates the socialization of specialists on sustainability and other managers within the organization (p. 209-210).

Eccles et al. (2014) found in their research that companies with a high degree of sustainability have implemented the work towards sustainability on the company boards (p. 2839). The companies from our research highlighted how owners and the board are involved in the work towards circular economy. Therefore, there are similarities between the findings of our study and Eccles et al. (2014). Previous research detects how the separate sustainability departments are responsible for the decision-making regarding sustainability (Arjaliès & Mundy, 2013, p. 291). This contradicts the findings of our research, where the decision-making regarding circular economy is assigned to the management group. By that, the sustainability and circular economy department have limited approval authority in the companies.

Moreover, administrative controls are operationalized through policies and procedures (Malmi & Brown, 2008, p. 293). Crutzen et al. (2017) found that all the companies have included sustainability in their rules and policies (p. 1296). These findings correspond to our research, as all companies elaborate on the use of internal policies, rules, and procedures towards circular economy. Regarding how internal rules of companies are used, they are, to a greater extent, affected by external rules and policies. As highlighted in the use of administrative controls, the policies of the EU are pointed out to influence the internal rules. Thereby, the internal rules and policies are used towards circular economy by incorporating the external regulations to affect the behavior in the desired direction towards circular economy.

## 5.2 Practical implications

Our research is one of few on management control systems towards circular economy. Regarding practical implications, the research will contribute to increasing companies, especially waste management companies, knowledge regarding how management control systems are used towards circular economy. From the result presented in this research, all the control systems are used together and form a package of management control systems towards circular economy (Malmi & Brown, 2008, p. 287). This chapter will concern the practical implications in relation to the different control systems of the theoretical framework.

**A practical implication of planning controls**

Although it might seem self-explanatory, the first practical implication relates to using long-term and action planning as control systems towards circular economy. All companies elaborated on the importance of using long-term planning to create objectives that direct the comprehensive behavior of the organization towards circular economy. This is particularly important concerning the pointed-out increasing objectives and regulations from the EU, with clear overarching goals for the companies towards circular economy. The regulations affect the overall operations of the companies, which makes it necessary to plan and facilitate the achievement of these goals in the long-term. Therefore, using only action planning could be confined to obtaining these aims. Long-term planning has the advantage of determining the strategy of the company and thereby directing behavior towards circular economy by establishing goals for the upcoming years. This complements the study of Riccaboni and Leone (2010), who found that establishing sustainability as a part of the strategy creates clear objectives for the operations of the organizations, and the plans direct the operations of each division (p. 139). Therefore, incorporating the objectives in the strategy creates clear goals of sustainability which can be translated into measurements and operate as guidelines in everyday operations and the long-term (Riccaboni & Leone, 2010, p. 139). Thereby, in line with the practice of four companies today, by combining long-term and action plans, the day-to-day behavior and operations can be influenced towards circular economy. Then, using both forms of planning controls is desirable for the company management regarding sustainability and circular economy.

**The use of measurements towards circular economy**

In coherence with the previous implication, all companies operate with objectives towards circular economy through their planning controls; thereby, measurements are created to direct behavior in accordance. However, the results regarding the use of measurements towards circular economy indicate a primary emphasis on non-financial measures related to the several levels of the waste hierarchy. Concerning the non-financial measurements, the implication relates to enhancing the measurements used towards circular economy so they, to a greater extent, can be used to improve and direct the behavior of employees. The measures of today are primarily focused on output, for example, the amount of waste recycled. However, using measures based on output instead of measures based on the performance of the employees could lead to moral hazard (Hendrikse, 2003, p. 95). To achieve the upper level of the waste hierarchy as the company desires and for the measures to be used as a control system, it is

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necessary to detect undesirable behavior. Therefore, our implication is for the companies to develop measurements regarding the conduct and effort of employees to a greater extent. Alternatively, create clear incentives for the employees to behave in accordance with the objectives of the companies. By doing so, the moral hazard could be avoided, and the control systems can function to a greater degree.

Further, as a part of the cybernetic controls of the companies, the waste fee is used as a financial measurement towards circular economy. The organizations are pressured to obtain the lowest fee possible, which entails affecting the households to increase sorting as this enables more waste to be sold, thereby reducing the fee. On the other hand, questions can be raised as to whether the fee as a part of the self-cost principle is designed to be used towards circular economy. The practice of the self-cost principle is whereby the companies receive a fee based on the amount of waste collected to compensate for the cost of handling waste (Meld. St. 45 (2016-2017), p. 20). Thereby, the fee is not used as a financial measurement to promote waste reduction, even though waste reduction is the uppermost level in the waste hierarchy and desirable in circular economy. This may indicate that a change in the self-cost principle, along with how the fee is designed and used, is necessary for it to be a financial measurement towards circular economy.

As measurements towards circular economy primarily consist of non-financial measures, there is a lack of using financial measurements. This is, according to the companies, because of difficulties in creating financial measurements to use towards circular economy. Our findings follow the results of the previously presented research by Arjaliès and Mundy (2013), who also found that companies had complications in measuring the financial results of sustainability (p. 295). Further, as one of the companies in our research pointed out, the budget has some limitations as a control system towards circular economy. This is because of the difficulties of measuring the financial activities closer to the upper level of the waste hierarchy and, thereby, the levels contributing towards circular economy. For example, can activities related to behavioral change among the customers of the waste management companies be harder to measure but necessary for less waste to be generated. In contrast, budgeting for a physical change, such as introducing a new bin for sorting a new product, is more manageable. As the companies have managed the operations and behavior of employees without financial measurements, this may imply a limited need for such control systems. There may be a connection between the absence of the use of financial measurements towards circular economy and how the companies cannot profit from their operations, which is related to the

self-cost principle (Meld. St. 45 (2016-2017), p. 20). However, by including more measurements in the management control of the companies, it enables greater control of the behavior of employees and detects undesirable actions.

### **The use of organizational design towards circular economy**

Another implication of our results is regarding the use of organizational design as a control system towards circular economy. Four companies elaborated on creating a separate department for sustainability and circular economy. By creating a separate sustainability department, the organizations enable specialization in the field (Flamholtz, 1983, p. 158). Further, by facilitating cooperation throughout the organization, directing behavior through the organizational structure is possible. Creating an organizational structure that facilitates specialization and collaboration across divisions is essential, and using the organizational structure is expected to be particularly important in the aspect of sustainability (Ditillo & Lisi, 2014, p. 34). A separate department provides for specialization on sustainability, and through the socialization of employees, it increases knowledge and performance.

However, concerning the results, the decision-making regarding circular economy is assigned to the upper management group in several companies. Thereby, the sustainability division does not have decision-making authority related to circular economy. An implication of using administrative controls in this manner is that the department gets a limited power of action concerning the work towards circular economy. This could imply that the decisions, to a certain extent, could be taken by employees with a lower level of knowledge within circular economy, which can lead to suboptimal decisions in the worst case. However, implementing initiatives regarding sustainable development will most likely affect operations managed by existing departments. Therefore, it can be beneficial for the companies that the upper-management group makes sustainability decisions if they are able to establish the changes in the various departments of the organization to a greater extent. On the other hand, if well-established cooperation is ensured between the sustainability department and the other departments, it will also be possible to achieve the same establishment even if this department makes the decisions of sustainability. In any case, the critical point of our implication is that the companies ensure compliance between the sustainability department and the decisions taken in the organizations. As discussed, several possible solutions enable this.

### **Practical implication of conflicting interests**

The subsequent practical implication of the results regarding the use of management control



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systems is the possibility of an arising principal-agent problem (Gibbons, 1998; Hendrikse, 2003). This is because there might be a conflict of interest between managers and employees, as the values about circular economy may not be anchored in the personal values of the personnel. The companies elaborate on the values to a greater extent being institutionalized in the organization through socialization or explanation, where only one of the companies particularizes employees being recruited with these values. Thereby, it implies to be essential to use cultural controls to a greater extent to establish the values of employees to be in accordance with the goals of the organization. This corresponds to Riccaboni and Leone (2010), who found that the use of cultural controls is a crucial aspect of the work of sustainability (p. 140). If the values of the employees are not in line with the values of the organization, there could be conflicting interests. This should be seen in relation to the previous implication of measurements to direct behavior mainly being based on the results of companies, not on the effort of employees and creating a possible moral hazard.

Therefore, it is essential for companies to ensure the anchoring of circular economy in the culture and the behavior of employees so that conflicts of interest do not arise. This is in line with the previous research of Ditillo and Lisi (2014), who found that an essential part of anchoring sustainability principles is ensuring they are shared among the members and decision-makers of the organization (p. 37).

### **Practical implications on the use of reward and compensation controls**

It is clear from the results that limited companies recruit employees with values regarding circular economy. Therefore, it may imply that the practice of today using primarily intrinsic rewards will not increase the motivation of the employees. By that, it could be argued that extrinsic rewards are necessary to achieve the behavior of the employees that is desirable for the organization. Contradicting, if the value-based control has succeeded in establishing circular economy as a part of the values of employees through either the internalization of explanation or socialization, intrinsic rewards are likely to affect the behavior as desired by the organization. Furthermore, it could also be argued that the work of employees is to a great extent of social responsibility, and therefore extrinsic rewards are not suitable (Bénabou & Tirole, 2006; Gneezy et al., 2011). Our suggestion is to clarify what motivates the employees so that reward and compensation controls can be used more focused and increase performance to a greater extent.

## 5.3 Limitations

Our research faces several limitations that call for future research. In this chapter, we will further discuss how the limitations regarding the theoretical foundation and the methodology restrict the findings of the research. The limitations will be elaborated on based on reliability and validity, as described in chapter 3.6.

### 5.3.1 Theoretical limitations

This research seeks to contribute new insights into the phenomenon of the use of management control systems towards circular economy in waste management companies in Norway. The research is based on existing theory, and limitations arise as there is limited research on the phenomenon (Johanson & Madsen, 2013; Svensson & Funck, 2019). Therefore, the theoretical foundation is based on theory that uses management control systems in a combination of theory on circular economy. A consequence of this is that it makes it hard to see connections and draw conclusions about the phenomenon this study aims to research. Furthermore, this can therefore be seen as a threat to the validity of the research as the limited research on the topic causes difficulty to demonstrate significance in the findings, making it hard to generalize the results of the research (Saunders et al., 2016, p. 400).

Another limitation related to the theoretical foundation of the research is our approach of defining waste management companies. In chapter 2.5.1, waste management companies are defined as companies handling waste through activities like collecting, sorting, and treatment (Ranjbari et al., 2021, p. 2). This definition constitutes a broad definition of the activities in waste management companies, which contributes to including an extensive aspect of organizations. The broad definition can be a threat to the external validity of the research as the findings may be difficult to generalize (Saunders et al., 2016, p. 400). A more specified definition of waste management companies can contribute to an in-depth understanding of a particular activity in waste management or a selection of specific companies. Consequently, a more specified definition of waste management companies can constitute in greater homogeneity of the findings by causing more generalization of the findings (Saunders et al., 2016, p. 400).

The last theoretical limitation is related to the selected primary framework of management control systems by Malmi and Brown (2008). This creates the foundation for the five research

questions that answer the main research question. However, the framework consists of some theoretical limitations. Each control system is explained to a limited extent, and an in-depth view is not provided. Thereby, there is a risk of missing out on findings as the research does not have the opportunity to seek detailed information from each company on the individual control system. However, when the five research questions were created, there was supplemented with some other existing literature in the field. Therefore, we believe that our theoretical foundation is suitable for the research and provides a suitable insight into the phenomenon.

### **5.3.1 Methodological limitations**

The choice of methodology can cause limitations in the research. Firstly, the limited number of participants can act as a limitation (Saunders et al., 2016, p. 400). This cross-sectional qualitative research studies a phenomenon at a particular time, as described in chapter 3.3.3. Furthermore, due to the time constraint of the research, the sample size is relatively small. A small sample size is a threat to the external validity of the research as it affects the transferability of the study. This limits the research by not being able to make causal explanations of the results (Saunders et al., 2016, p. 400). A longer time frame of the research could have resulted in a depth in the findings, which we could not accomplish in this research (Saunders et al., 2016, p. 200). Due to these limitations, we were not able to explain the results further.

Another limitation of the research is the sample of participants. As discussed in chapter 1.3, this exploratory multiple-case study is delimited to Norwegian waste management. Therefore, the research findings can mainly be generalized to the management control systems of the organizations participating in this research and potentially to other waste management companies in Norway with similar organizational structure. Due to differences in the organizational structure and management control, it is challenging to generalize the findings outside the research sample, as described in chapter 3.4.1. Other organizations may have different control patterns for managing circular economy and are therefore not homogenous with our sample. A consequence is therefore that it can be challenging to generalize conclusions to other groups (Buchanan, 2012, quoted in Saunders et al., 2016, p. 205).

The research participants have various backgrounds concerning their education and previous work experience, causing a difference in the understanding of the phenomenon of the research.

A consequence of this can cause a difference in the interpretations of the questions by the participants, which can contribute to limitations of the research by affecting the validity (Saunders et al., 2016, p. 203). Another limitation that can occur from the answers of the participants is the ability the researchers have to understand the meaning of the answers, which can lead to research errors if the researcher misinterprets the answers. This threatens the reliability of the research as the results may contain false assumptions (Saunders et al., 2016, p. 203).

The research consisted of interviews conducted in Norwegian, and as all the participants were Norwegian, this was a natural starting point. Thereby, it allowed the participants to express themselves naturally and clearly (Saunders et al., 2016, p. 403). Therefore, the results from the interviews had to be translated into English to be applied to the research (Saunders et al., 2016, p. 416). This causes a limitation of the research regarding information getting lost during the translation process (Saunders et al., 2016, p. 416). Research errors may occur due to translating data as the meaning of words may change if the researcher is not thorough in the translation process, which threatens the reliability of the research as this can lead to biases in the results (Saunders et al., 2016, p. 416).

A final methodological limitation of the research is related to the fact that the interviews were conducted digitally. Thunberg and Arnell (2022) explain that using a digital platform for conducting interviews may limit the relationship between the participant and the researcher, as it is more complicated to achieve the same personal connection digitally than if the interview had taken place physically (p. 762). Digital interviews make it hard to capture the body language of the participants as only the upper body is visible on camera. This can cause the researcher to overlook information that could have been of value to the research, causing a threat to the reliability of the research (Thunberg & Arnell, 2022, p. 762). Furthermore, when interviewing on a digital platform, the surroundings can create distractions for the participants, causing participant errors in the external reliability of the research if the participants are affected by this (Saunders et al., 2016, p. 403). Digital interviews are therefore affected by how comfortable the participants are during the interview regarding expressing themselves in a safe environment without distractions (Thunberg & Arnell, 2022, p. 762). If the participant is not comfortable, it will affect the answers in the interview, causing a threat to the reliability of the research (Saunders et al., 2016, p. 421).

## 5.4 Future research

In the following chapter, interesting findings regarding management control systems towards circular economy that call for future research will be pointed out. The limitations presented in the chapter above emphasize the possibilities for future research on the phenomenon. Further, as pointed out in the background of the research, there is limited research on the use of management control systems in relation to sustainability and circular economy. Therefore, it is a desire for more research in the area to contribute to further insight and understanding of how control systems are used in companies. Our research has discovered other aspects of waste management companies and circular economy that are interesting and relevant for future research. Therefore, this chapter is divided into three parts, each representing a possibility for future research.

### 5.4.1 Replication of the research

An idea for future research could be to replicate our research as the use of management control systems towards circular economy may vary within another sample or over time. As emphasized in the methodology chapter our research is limited to five Norwegian waste management companies over a period of four months. Therefore, a possibility for future research is to replicate our research by increasing the sample size of the research. By increasing the sample size and including more respondents the research can, to a greater extent, draw generalized conclusions (Saunders et al., 2016, p. 400). In addition, a replication could also be done with a longer time frame, as our research is cross-sectional, and the time frame of the thesis is constricted. However, by conducting a longitudinal research it is possible to study changes and development over a longer period (Saunders et al., 2016, p. 200). This could be relevant as circular economy requires continuous development to achieve resource efficiency and is not an end goal (Lüdeke-Freund et al., 2019, p. 37). Based on this, research over a longer period would be interesting as increased insight into how the use of management control systems will be accomplished.

There are as well possibilities to replicate the research within the industry of waste management or by investigating the use of management control systems in another industry. Our research is delimited to only publicly owned waste management companies, however, there exist as well privately owned waste management companies. By replicating the research using waste management companies with private owners, there are possibilities to increase

insight into the use of management control systems in the industry and investigate if there exist differences in the use caused due to owners (Saunders et al., 2016, p. 400). Another possibility is to replicate our research in another industry. By investigating another industry, it would enhance the insight and understanding of how management control systems are used in relation to sustainability to a greater extent (Saunders et al., 2016, p. 400). There might be variations in the use of management systems that are linked to the industry of the company.

The results of this research can be strengthened by being replicated if there are detected similarities, and thereby increasing the degree of reliability and validity if the results are detected over several studies (Saunders et al., 2016, p. 205).

#### **5.4.2 The effect of collaboration towards circular economy**

A note from the results that creates the basis of the next proposed research for the future is the use of external collaboration. All companies elaborate on extensive cooperation related to the work towards circular economy, whereby the Norwegian Waste Management and Recycling Association is pointed out as important to unite the work of the various companies. The collaborations that are pointed out exist both between waste management companies as well as with other companies. One of the companies pointed out cooperation with companies who produce products to create packaging suitable for circular economy. By this, the work towards circular economy is an important element of the entire value chain. Whereby the waste management companies are limited to handling the products as they are designed, there is a desire for a change in the entire value chain from the design of the product to be compatible with sustainable development. This underpins the aspect that circular economy and sustainable development are not possible for a company to achieve on its own, and cooperation is necessary (Jørgensen & Pedersen, 2018, Kiron et al., 2015).

Additionally, all companies elaborate on collaborations within the waste management industry by sharing knowledge and experiences. These findings are interesting as they contradict a global survey done by Boston Consulting Group in 2015, which found that less than 50% of companies are engaging in cooperation regarding sustainability (Jørgensen & Pedersen, 2018, p. 123). Therefore, it would be particularly interesting to investigate the use of these collaborations towards circular economy within waste management companies. Why are particular alliances created, which ones are more essential, and how are they used in the work towards circular economy? By having insight into such questions, it could improve the

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performance of the companies related to circular economy and sustainable development. This because the SDGs can only be achieved through global collaboration (Florini & Pauli, 2017, p. 584).

A challenge and the paradox of collaboration between companies is to compete and cooperate simultaneously (Jørgensen & Pedersen, 2018, p. 123). However, what makes waste management companies special regarding creating alliances and collaborations, is how the companies are not in competition with each other. Because the municipal boundary determines the market for the various companies, and the municipalities grant them exclusive rights to perform the service (Meld. St. 45 (2016-2017), p. 21). The limited market for the companies might imply a greater use of collaboration within the industry of waste management and facilitates for open sharing of knowledge. This underpins the interesting future research on how these collaborations have or which effect they have on the operations of the companies towards circular economy.

### **5.4.3 Drivers and barriers towards circular economy**

Another idea for future research is considering the barriers and drivers of companies towards circular economy. From the research carried out, the objectives and regulations from the EU were particularly highlighted to be central in the companies planning by creating objectives and regulations that affect the operations of the companies. It is mandatory for the companies to act in accordance with the regulations because they are incorporated in Norwegian law. This indicates that the EU and its regulatory changes are a driver for companies to change their operations according to the principle of circular economy, which follows the findings of Govindan and Hasanagic (2018, p. 301). However, there might as well exist several other drivers towards circular economy that causes a change in the operations of the companies. By increasing the knowledge of the drivers towards circular economy and which barriers are necessary to overcome to enable a change from the linear “take, make, and dispose” value chain, the companies can better enable a circular business model.

Moreover, by investigating the motivation for the companies to focus on circular economy over time, it can be clarified which drivers have a more substantial influence on the organizations. As companies have several stakeholders with different interests, which affect the performance of the organization (Jørgensen & Pedersen, 2018, p. 129). By raising the knowledge of the interest of the stakeholder, the barriers and drivers the companies are facing

towards circular economy are accounted for. For instance, as circular economy and sustainable development get increasing anchoring in society, it is likely that households could demand more environmentally friendly solutions. Thereby, the customers could be one of the drivers for the companies to increase their focus towards circular economy (Ekins et al., 2019; Tura et al., 2019)

Despite possible drivers towards circular economy for the companies, there could as well exist barriers to overcome. Could the type of ownership be a barrier or a driver towards circular economy? As there exist both publicly owned waste management companies as well as waste management companies with private owners, this could be an element to investigate further. Are the publicly owned companies constrained by tight budgets by the municipalities and thus limiting their ability towards circular economy? Moreover, do privately owned companies have owners who do not want to invest in the circular economy? One barrier for the companies could be if there is a lack of economic incentives towards circular economy with the self-cost principle of today which limits the possibilities for the companies to profit from the operations. In addition, waste management companies are limited by the design of the products to achieve circular economy. A barrier could therefore be related to constraints in the supply chain, by the design of the products not being aligned with the principles of circular economy (Ekins et al., 2019; Govindan et al., 2018)

All these elements in the paragraphs above combined illustrate the possibility of future research on the topic of barriers and drivers to take into consideration for waste management companies towards circular economy.



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## 6. Conclusion

The background of the thesis was the limited existing research on the field of management control systems regarding sustainability and particularly circular economy (Crutzen et al., 2017; Ditillo & Lisi, 2014). Because of this, the purpose of the study was to increase the knowledge of the topic and explore how management control systems are used towards circular economy in waste management companies. This is because waste management companies are an important element towards circular economy (Tsai et al., 2020, p. 2). The results were obtained through a qualitative research design by interviewing 11 managers in five waste management companies.

To answer the main research question of the thesis, “How are management control systems used towards circular economy in Norwegian waste management companies?” we conclude that all five control systems are used. However, reward and compensation controls are used to a limited extent as a control system in all companies. Furthermore, how the different control systems are used must be seen in relation since they influence each other. Planning controls is, to a greater extent, used to incorporate the increasing regulatory pressure towards circular economy as well as the waste hierarchy, both in long-term and action plans. The regulations contain concrete, measurable goals for the business, which the companies control and direct performance towards circular economy through non-financial measurements in line with the waste hierarchy in cybernetic controls. However, an implication is that these measurements can have some limitations in being used as a control mechanism, as they are mainly based on the operations of the company and not the behavior of the employees. Thereby, the companies use cultural controls to anchor the desired behavior towards circular economy in the values of the employees, so their effort and behavior are controlled (Svensson & Funck, 2019, p. 395). As companies direct their behavior through values, they focus on increasing motivation through intrinsic rewards. Furthermore, the companies control the behavior through organizational design by creating a separate department of sustainability (Corsi & Arru, 2020, p. 39).

There is excellent potential for future research in the field, which will contribute to an increased perspective on incorporating circular economy or sustainability in management control.

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## Appendix

### Appendix A – Overview of respondents

Respondent	Company	Position	Duration
1	Company 1	Sales Manager	30:57
2	Company 2	Head of “Relevant Department”	32:56
3	Company 2	Head of Communication	36:04
4	Company 3	Head of Operations and HR	42:11
5	Company 1	CEO	48:41
6	Company 3	CEO	53:28
7	Company 4	Head of Communication	48:39
8	Company 5	General Manager	35:51
9	Company 5	CEO	26:25
10	Company 4	CEO	36:10
11	Company 3	Head of Finance	43:41

## Appendix B – Interview guide

### *Introduction*

1. Can you give us a brief description of your position and your areas of responsibility?
2. How long have you been employed in your position and how long have you been employed at (*Company*)?
3. Can you tell in the broader terms about (*Company*) operations and their work toward circular economy?

### *Subject 1: Planning controls*

4. How does the long-term strategic planning of (*Company*) work toward circular economy take place? What measures have possibly been implemented in line with this?
5. Are the long-term strategic plans for the work toward circular economy broken down to have an effect on a shorter perspective? If so, how?

### *Subject 2: Cybernetic controls*

6. Is the adaptation to circular economy included in the budgets? If so, how?
7. Which measurements are used in the work toward circular economy in (*Company*)? If so, how are these used?

### *Subject 3: Reward and compensation controls*

8. Are there any reward systems towards the work with circular economy for the employees in the company? If so, how?
9. How are employees in (*Company*) motivated to work toward circular economy?

### *Subject 4: Administrative controls*

10. How are the responsibility distribution and decision-making in relation to circular economy in (*Company*)?
11. How is circular economy organized in (*Company*) with regard to the organizational structure?
12. To what extent, and how are the board and owners involved in the work with circular economy?
13. Which internal and external rules, guidelines, and procedures affect the work with circular economy in (*Company*)? If so, how is this incorporated into (*Company*)?

### *Subject 5: Cultural controls*

14. Do you feel that (*Company*) values, vision, and mission are guiding the work toward circular economy? If so, how?
15. How do you implement circular economy in the work with the culture in (*Company*)?

## Appendix C – Declaration of consent

### **Vil du delta i forskningsprosjektet?**

Dette er et spørsmål til deg om å delta i forskningsprosjektet "From Waste Management Towards Resource Management in Norway". I dette skrivet gir vi deg informasjon om målene for prosjektet og hva en deltakelse innebærer.

#### **Formål**

Dette prosjektet er tilknyttet en masteroppgave innenfor økonomisk styring ved Norges Handelshøyskole, som gjennomføres høsten 2022. Formålet med oppgaven er å svare på problemstillingen: "How are management control systems used towards circular economy in Norwegian waste management companies?", som kan bli oversatt til "Hvordan bruker norske renovasjonsselskaper styringssystemer i retning mot sirkulær økonomi?"

#### **Hvem er ansvarlig for prosjektet?**

Lisa Isolde Sanne Hjortland og Silje Rennesund Ellingsen, studenter ved Norges Handelshøyskole, med professor Marcus Selart som veileder er ansvarlig for prosjektet.

#### **Hvorfor får du spørsmål om å delta?**

Vi har kontaktet deg med den hensikt å samle inn informasjon og opplysninger fra representanter i norske renovasjonsselskaper. Prosjektet omhandler styringssystemer og derfor er det i hovedsak ønskelig å intervju øvre ledere og andre ledere som benytter disse verktøyene aktivt i sin arbeidshverdag.

#### **Hva innebærer det for deg å delta?**

Hvis du velger å delta i prosjektet, innebærer det at du blir intervjuet av oss i forskergruppen. Intervjuets varighet er anslått til 40-60 minutter, og det vil foregå over Teams. Vi vil ta skjermopptak av intervjuet, og i ettertid vil vi transkribere innholdet i opptaket.

Intervjuet består av spørsmål knyttet til styringen av virksomheten mot en overgang til sirkulær økonomi. Intervjuguide sendes i forkant av intervjuet på forespørsel.

Oppgaven vil bli skrevet på engelsk, derfor vil all informasjon vi samler inn bli oversatt til engelsk dersom det er samlet inn på et annet språk.

I de tilfeller det er relevant vil vi også samle inn skriftlig dokumentasjon (sekundærkilder) som du måtte ønske å dele med oss i intervjuet.

#### **Det er frivillig å delta**

Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykket tilbake uten å oppgi noen grunn. Alle dine personopplysninger vil da bli slettet. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

#### **Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger**

Opplysningene som fremkommer av intervju benyttes kun til de formål nevnt i samtykkeerklæringen. Alle opplysninger behandles konfidensielt og i samsvar med regelverk for personvern.

- Kun prosjektgruppen og veileder vil ha tilgang til datamaterialer
- Navn, kontaktopplysninger og øvrige opplysninger erstattes med koder på egen liste, slik at disse ikke lar seg spore tilbake til respondent

**Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?**

Opplysninger anonymiseres ved prosjektets slutt desember 2022. Samtlige datamateriale slettes ved innlevert masteroppgave.

**Dine rettigheter**

Så lenge du kan identifiseres i datamaterialet, har du rett til:

- innsyn i hvilke personopplysninger som er registrert om deg, og å få utlevert en kopi av opplysningene,
- å få rettet personopplysninger om deg,
- å få slettet personopplysninger om deg, og
- å sende klage til Datatilsynet om behandlingen av dine personopplysninger.

**Hva gir oss rett til å behandle personopplysninger om deg?**

Vi behandler opplysninger om deg basert på ditt samtykke. På oppdrag fra Norges Handelshøyskole har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Hvis du har spørsmål knyttet til NSD sin vurdering av prosjektet, kan du ta kontakt med:

- NSD – Norsk senter for forskningsdata AS på epost ([personvertjenester@nsd.no](mailto:personvertjenester@nsd.no)) eller på telefon: 55 58 21 17.

Eventuelle spørsmål til studien eller informasjon om hvordan du kan benytte dine rettigheter kan rettes til:

- Norges Handelshøyskole attn. Marcus Selart: [marcus.selart@nhh.no](mailto:marcus.selart@nhh.no)
- Norges Handelshøyskoles personvernombud: [personvernombud@nhh.no](mailto:personvernombud@nhh.no)

Med vennlig hilsen

Marcus Selart  
(Veileder)

Lisa Isolde Sanne Hjortland og Silje Rennesund Ellingsen  
(Studenter)

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**Samtykkeerklæring**

Jeg har mottatt og forstått informasjon om prosjektet “From Waste Management Towards Resource Management in Norway” og har fått anledning til å stille spørsmål. Jeg samtykker til:

å delta i intervju

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet

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(Signert av prosjektdeltaker, dato)

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## Appendix D – Overview of secondary data

#	Name	Type of Document	Company
1	Waste strategy and goals	Public document	Company 1
2	Waste strategy	Public document	Company 1
3	Annual Report 2021	Public document	Company 1
4	Annual Report 2021	Public document	Company 2
5	Annual Report 2021	Public document	Company 3
6	Strategy Report	Public document	Company 3
7	Strategy Report	Public document	Company 4
8	Annual Report 2021	Public document	Company 4
9	Annual Report 2021	Public document	Company 5

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## Appendix E – Explanation of quotations format

<b>Sign</b>	<b>Explanation</b>
(text, ed.)	Content is neutralized/generalized for reasons of anonymity
██████	Content cannot be neutralized/generalized and is censored for privacy/anonymity reasons
[...]	The cited quote has a source in a larger quote. The sign indicates that other text is excluded, and where this is located in relation to the cited quotation
[text, ref.]	Clarification of what the respondent refers to/replies to/talks about/means etc.