Master thesis

Circular Economy adoption at Engie's organisational culture

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Abstract

Circular Economy (CE) is a tool for Corporate Sustainability (CS) that has gained popularity in the last years. Like with most CS initiatives, a supportive organisational culture is necessary to successfully adopt CE. However, current scientific literature does not provide an insight on what type of organisational culture would support CE adoption. This thesis aims to identify the changes necessary to an organisational culture for it to be supportive of CE adoption. For this purpose, literature review is used to provide an overview of CE and CE drivers, organisational change for CS and organisational culture. These aspects are integrated in a research framework. The research method was a case study and the grounded theory constant comparative analysis. This analysis used secondary data, mainly interviews with the organisation's employees and with two employees of an external stakeholder. The results show that multiple drivers exist for CE adoption, the most important being customer satisfaction and on a second place, competitors' benchmarking. This indicates that the organisation might be customer and externally focused. Sustainability values would support CE adoption, while values such as risk aversion, customer-focus, money-focus and reactive attitudes within the organisation need to be changed in order to adopt CE. Money-focus values should be substituted with holistic thinking values. The organisation should also have a more proactive, innovative and long-term thinking mind-set. Employees' preconceptions that CS and CE are expensive or "something extra" should be changed. This thesis has developed a CE drivers' model and it has highlighted the importance to undertake organisational culture change when aiming to adopt CE within the organisation. Further research is required to be able to generalise these findings as well as to explore the influence of the existing organisational culture in the perception of the change drivers.

Key words: Circular Economy, corporate sustainability, organisational culture, organisational change, change drivers

Executive summary

There are several drivers for Circular Economy (CE) adoption, the most important being customer satisfaction and on a second place, competitors' benchmarking. This indicates that the organisation might be customer and externally focused. Other drivers, like culture or the culture's sustainability values, would support CE adoption, and link CE drivers to the needed organisational culture change. CE should be promoted internally and not only because of external CE drivers such as customer satisfaction. The reason is that most interviewees do not seem to perceive that CE satisfies the customer and that, whether true or false, hinders CE adoption.

To describe the organisational culture, interviewees have mentioned values that need to be changed to successfully adopt CE. These include values such as risk aversion, customer-focus, money-focus and reactive attitudes. The company also needs to change the employees' preconceptions that CS and CE are expensive or as something additional or external to employees' daily responsibilities.

Money-focus values should be substituted with holistic thinking values. The organisation should also have a more proactive, innovative and long-term thinking mind-set. It might also be necessary to strengthen the overall sustainability values of the organisational culture, which is not perceived as particularly sustainable.

To achieve these changes it has been suggested to use CE within pilot projects. However, this should be accompanied by organisational culture change. For this purpose, a clarification of the responsibilities of every department in achieving CE would aid in its adoption. For this, interviewees have suggested the use of Corporate Sustainability (CS) and CE objectives as well as to publicise and communicate the support for CE from leadership positions and by the organisation as a whole.

Overall, CE has shown potential to be used as a tool for CS. This thesis proves that it requires a supportive organisational culture to be successfully adopted.

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Chapter 1. Introduction

During the last decade, social and environmental problems such as poverty, resource depletion, increasing pollution and volatile resource prices have dominated media attention (Avery, 2015; United Nations Environment Programme, 2006; World Economic Forum, 2014). Companies are perceived as the cause of many of such environmental and societal problems, but it is also within their abilities and to find a solution (Dunphy, Griffiths, & Benn, 2003; Küpers, 2011; Lozano, 2013b). Companies should feel compelled to find such solution, since problems like volatility in materials' prices and supply also affect companies' future economic competitiveness and resilience (Preston, 2012; World Economic Forum, 2014).

In this context, companies have been recognising the relations and inter-dependences between the economic, environmental, social and the time dimensions (Lozano, 2013b). These dimensions are linked through the term Corporate Sustainability (CS) (Chowdhury, Hossain, & Dewan, 2015; Linnenluecke, Russell, & Griffiths, 2009), which is understood as the means to ensure the realisation of organisational objectives while reducing the company's ecological impact and improving social and human welfare (Linnenluecke & Griffiths, 2010).

CS has been embodied in many corporate initiatives, such as Cleaner Production, Corporate Social Responsibility, Environmental Management Systems, Industrial Ecology, The Natural Step, Life Cycle Assessment (Lozano, 2012; Robèrt et al., 2002) and Circular Economy (Murray, Skene, & Haynes, 2015). The choice of one or a combination of such initiatives depends on the company's strategy (Galpin, Whitttington, & Bell, 2015; Robèrt et al., 2002), the company's system and context (Lozano, 2012), and the underlying drivers that will support the sustainable practice (Crittenden, Crittenden, Ferrell, Ferrell, & Pinney, 2011).

In adopting CS initiatives, most of the literature has focused on 'hard issues', like changes in raw materials, processes, and products (Linnenluecke et al., 2009; Lozano, 2013a). 'Soft issues', such as sustainability drivers or organisational culture, have received less attention (Crittenden et al., 2011; Lozano, 2013b), even though they are crucial to CS (Lozano, 2013a). An organisational "sustainability culture" is crucial to develop truly innovative sustainable solutions (Galpin et al., 2015). Unless organisations undertake substantial cultural change, other changes will be superficial and insufficient to develop a truly sustainable organisation (Linnenluecke & Griffiths, 2010).

An initiative with considerable potential to contribute to sustainability is Circular Economy (CE) (Andrews, 2015). According to the Ellen MacArthur Foundation (2013a), CE is based on waste becoming input for other industrial systems, eliminating the use of toxic chemicals, relying on renewable energy, building resilience through diversity and practicing systems thinking. Waste is eliminated through the design of materials, products, systems and business models (World Economic Forum, 2014). In other words, it focuses on material recovery as a way to balance the economic, environmental and social dimensions (Ghisellini, Cialani, & Ulgiati, 2015).

During the last ten years, CE has gained momentum and it is currently receiving high-level policy attention in the European Union, China and the United Nations, as well as support from NGOs and companies (Deutz, Lyons, & Bi, 2015; European Commission, 2014, 2015; Geng & Doberstein, 2008; Greyson, 2007; United Nations Environment Programme, 2006) and increased attention from researchers (Lieder & Rashid, 2015). The reasons are that CE is positively framed, focusing on opportunities rather than threats, and it has the potential to become an open and transparent concept for companies and a source of job creation for the society (Kok, Wurpel, & Ten Wolde, 2013).

Some challenges to CE adoption should be addressed to achieve its full potential. First, companies lack the information and capacities to adopt CE (European Commission, 2014). Second, existing CE literature focuses on waste, resource use and environmental impact, overlooking the business perspective (Lieder & Rashid, 2015). Research with a business perspective focuses on industrial processes (Moreno, Braithwaite, & Cooper, 2014), 'hard issues' that do not take into account organisational culture, even though culture is key to CE adoption (Liu & Bai, 2014). Finally, there is limited research on CE drivers. The lack of research in the explicit business advantages of CE adoption, especially in the individual level, can inhibit CE implementation (Lieder & Rashid, 2015).

To address these research gaps, the main objective of this thesis is to identify the necessary changes to incorporate CE in the organisational culture. The secondary objectives are: 1) to investigate how CE affects organisational culture; 2) to investigate how current organisational culture influences choices in CE adoption; and 3) to identify drivers to CE adoption. These objectives are phrased in the following research question (RQ) and its sub-questions (SQ):

RQ. ***What organisational culture changes promote the adoption of CE?***

> **SQ1.** *What aspects of CE affect or could affect the organisational culture?*
>
> **SQ2.** *How does an organisational culture influence CE adoption?*
>
> **SQ3.** *What drives an organisation to adopt CE?*
>
> **SQ4.** *How do CE drivers influence the adoption of CE in an organisation's culture?*
>
> **SQ5.** *What have been the differences between current organisational culture and the culture necessary to adopt CE?*

This research is structured as follows: after the Introduction, Chapter 2 reviews the theoretical background that grounds the research and helps to build a research framework; Chapter 3 discusses the methods, including data collection and analysis as well as scope and limitations; Chapter 4 highlights the main findings of the research within the case study of Engie Infra&Mobility; Chapter 5 discusses those findings by putting them in context with the literature and the acknowledged limitations; and Chapter 6 presents the conclusions and the recommendations for the organisation.

Chapter 2. Literature review

This section presents a systematic literature review with the objective to define CE and to identify the current state of academic insight with regards to CE. Within this section, several strategies and business models to incorporate CE into the company setting are outlined. The organisational change management for CS literature is reviewed with the purpose to describe the processes with which to achieve the change. Organisational culture and its components also need to be defined, as they are the subjects of change.

2.1. Circular Economy (CE)

CE belongs to the field of sustainable development and CS, as it has been used as a tool to achieve increased environmental sustainability and sustainable resource use (Genovese, Acquaye, Figueroa, & Koh, 2015; Ghisellini et al., 2015; Greyson, 2007; Murray et al., 2015). A sustainable resource use improves our ability, and the ability of future generations, to meet their needs and makes overall sustainability more probable (Sauvé, Bernard, & Sloan, 2015). Most CE definitions consider not only resource restoration and replenishment, but also economic growth and the use of renewable energy (Prendeville, Sanders, Sherry, & Costa, 2014).

One of the most popular CE definitions is from the Ellen MacArthur Foundation (2013a, p. 7): "an industrial system that is restorative or regenerative by intention and design". This definition is favoured by many researchers and organisations (see European Commission (2015) or United Nations (2006)) because of its system thinking approach and popularity (Kok et al., 2013). However, other researchers have declared the necessity of a more concrete and practical alternative (see Haas, Krausmann, Wiedenhofer, & Heinz, 2015; Murray et al., 2015; Prendeville et al., 2014). For example, Murray et al. (2015, p. 9) define CE as "an economic model wherein planning, resourcing, procurement, production and reprocessing are designed and managed, as both process and output, to maximise ecosystem functioning and human well-being." The inclusion of the human well-being in this particular CE definition further emphasises the link of CE and CS.

CE[1] is primarily rooted in Cradle-to-Cradle and Industrial Ecology (Ghisellini et al., 2015; Murray et al., 2015). As with Industrial Ecology, CE focuses on product life extension to minimise material flows, energy flows and environmental impact (Lieder & Rashid, 2015). In the last decade CE has differentiated from Industrial Ecology by 1) extending its focus to economics, 2) by emphasising the role of alternative business models to maximise resource value (Ghisellini et al., 2015; Lieder & Rashid, 2015; Murray et al., 2015), and 3) by stressing the importance of optimising systems instead of components (Murray et al., 2015). This way, CE has contributed to the creation of an economy-wide system model of economic development, production, distribution and recovery of products (Ghisellini et al., 2015).

[1] Even though the concept of CE originally appeared in the work of Leontief (1928) as an economical concept, researchers do not credit him as the creator of the concept (see Murray et al., 2015). The reason for this might be that the concept is currently used with a different meaning, where the references are predominantly environmental instead of economical (Lieder & Rashid, 2015).

There are several strategies to operationalize the CE within an organisational setting (Preston, 2012). Among others, using longer-lasting products, encouraging modularisation, remanufacturing and component reuse, and designing products using less materials (Ellen MacArthur Foundation, 2013a; Preston, 2012) and that are suitable to be upgraded (World Economic Forum, 2014). CE also encourages a shift towards the use of renewable energy and the elimination of toxic chemicals, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models (Ellen MacArthur Foundation, 2013a).

Alternative business models –i.e. the organisation's logic on how to create value (Hock, Clauss, & Schulz, 2015) are often required for organisations to adopt CE (Genovese et al., 2015). The reason is that CE requires organisations to implement, for example, the development of take-back systems, the capabilities to remanufacture products or the development of leasing agreements (Gregson, Crang, Fuller, & Holmes, 2015). There are five business models that reportedly foster CE, namely, a circular supply chain, recovery and recycling, product life extension, a sharing platform and product as a service or performance-based payment models (Lacy & Rutqvist, 2015; World Economic Forum, 2014).

Considerable organisational changes are required for an organisation to adapt its business model (Lacy & Rutqvist, 2015). Organisational changes tend to be complex and uncertain, which suggest that the change pathway and strategy should be planned for (Lozano, 2013b). For that reason, sustainability literature has fostered the specific research field of organisational management for CS, which is reviewed next.

2.2. Organisational Change Management for Corporate Sustainability

According to Lozano (2013b), organisational change management focuses on how an organisation transitions from the current state (*status quo*) to a more desirable state (*status quo novus*). Organisational change management for CS has the objective of achieving a *status quo novus* where the organisation is more sustainable.

For the organisation to break with unsustainable attitudes and to respond quickly to external stimuli, it is necessary to manage and balance change drivers (Lozano, 2013a). Previous research by Lozano (2013a) provides an overview of CS drivers (see Figure 1). Internal drivers include internal organisational processes; external drivers involve relationships with external stakeholders; and connecting drivers offer a deep understanding of operant CS drivers. According to DeSimone and Popoff (2000), internal drivers are more useful in moving an organisation towards sustainability.

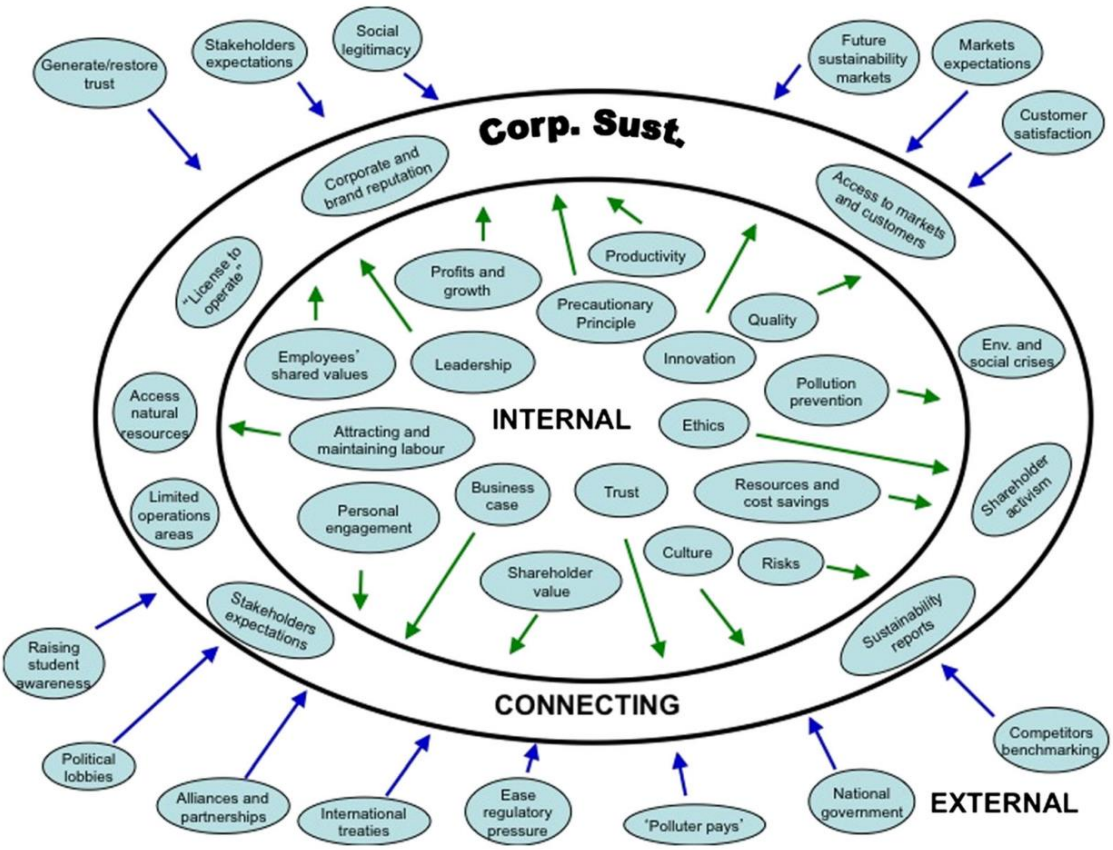

Figure 1. Corporate Sustainability driver model (Lozano, 2013a).

In addition to change drivers, the organisational culture will also affect the organisational change processes (Fernández, Junquera, & Ordiz, 2003). An organisation is made of the divergent values and beliefs of individuals (Johnson & Macy, 2001), that interpret organisational behaviour to define organisational culture (Luthans, 2002). However, to achieve change it is not enough to take into account the views and perceptions of the individuals within the organisation (Clement, 1994). Organisational groups have different sets of values, norms and behaviours (Donate & Guadamillas, 2010) which should be also be taken into account (Clement, 1994). The organisation as a whole also influences individuals and groups through the organisational culture, making the learning process mutual and inter-related among individuals, groups and the organisation (Lozano, 2008). Therefore, due to their interrelations, the three ontological levels of the organisation –i.e. individuals, groups and organisation, should be taken into account when planning organisational change (Lloria & Moreno-Luzon, 2014).

An organisational change model that takes into account the interrelations among the three organisational levels is Lozano's (2008) MuSIC memework (see Figure 4). It differentiates between behavioural –i.e. what is done-, emotional –i.e. what is believed- and informational attitudes –i.e. what is learnt. The three sets of attitudes also interact among each other, so change must be congruent among them. Furthermore, the MuSIC memework exists within an organisational system that includes goals and rules (Lozano, 2013b).

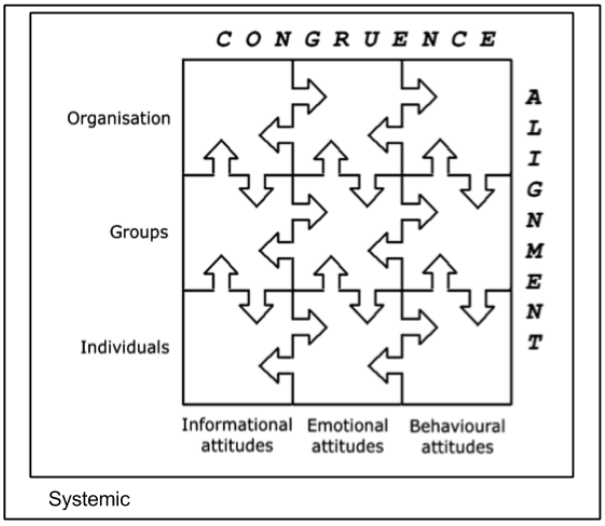

Figure 2. MuSIC memework (Lozano, 2013, p.285)

Ideas, discourses and techniques used during the change process should be coherent (Dambrin, Lambert, & Sponem, 2007) and take into consideration the nature, scale, timescale (Buchanan et al., 2003) and possible ramifications of change (Forsythe, 2005). This can be achieved by developing a change plan or institutional framework guidance to adopt a more sustainability orientated state (see Figure 3).

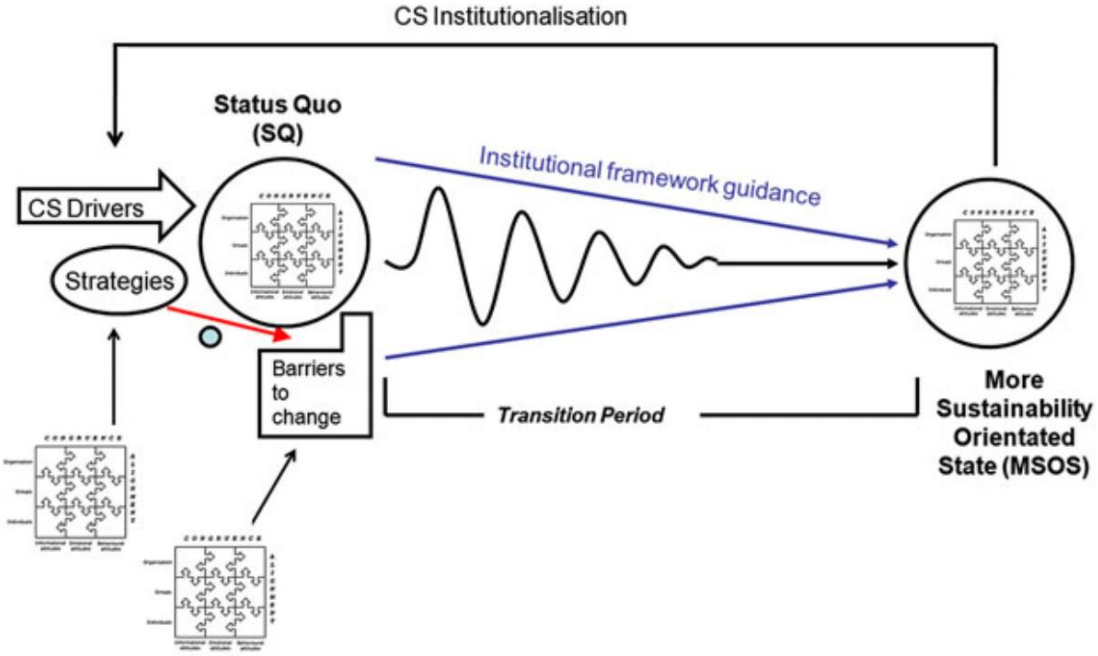

Figure 3. Organisational change from *status quo* to *status quo novus* (Lozano, 2013b, p.292). This research understands the *status quo* as the organisational culture and focuses in the change drivers.

An analysis of the existing organisational culture can be used to design the organisational change initiative (Forsythe, 2005). To ensure successful change within the organisation it is useful to work with and through the existing culture (Clement, 1994). Current values and ideological underpinnings of an organisation's culture affect change implementation and the types of outcomes that can be

observed (Linnenluecke & Griffiths, 2010). Furthermore, it is necessary to find and act upon specific opportunities –i.e. change drivers (Kopnina, 2015).

Organisational changes are better accepted if they are perceived as central to the survival of the organisation (Buchanan et al., 2003; Dawson, 1994; G. Johnson, 1992) and as coherent with the different elements of corporate culture (Dubruc, Peillon, & Farah, 2014) – i.e. artefacts, values and underlying assumptions. Organisational change for CS often requires changes to the organisational culture (Appelbaum et al., 2016). Organisational culture can be either the main barrier or the main driver when adopting an innovation (Fernández et al., 2003; Hock et al., 2015; Naqshbandi, Kaur, & Ma, 2014) like CE. For this reason, literature on organisational change management has to be reviewed.

2.3. Organisational culture

The definition of organisational culture varies across literature, though most definitions have similarities (Bortolotti, Boscari, & Danese, 2015; Harris & Ogbonna, 2002; Luthans, 2002). One of the most widely used definitions of organisational culture (see Baumgartner, 2009; Donate & Guadamillas, 2011; Alavi et al., 2006; Fernández, et al., 2003; Hock, Clauss & Schullz, 2015) was proposed by Schein (2004) and is represented in Figure 4. According to Schein (2004), organisational culture consists of basic assumptions, values and artefacts.

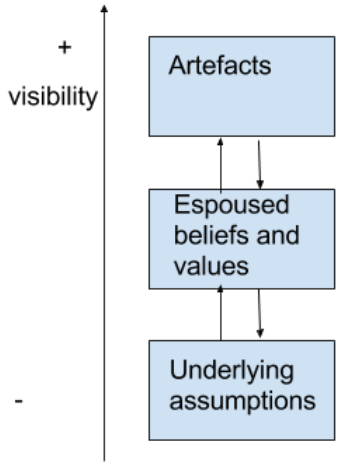

Figure 4. Elements of the organisational culture. Adapted from Schein (2004)

Artefacts are easily recognised, as they include visible structures and processes (Clement, 1994; Hock et al., 2015; Schein, 2004), so they require the deeper levels of culture to give them meaning (Schein, 2004). They include the ways of communicating, procedures, products, office arrangements, architecture, documentation, technology, rituals, ceremonies and the organisation's myths and stories (Baumgartner & Zielowski, 2007; Clement, 1994).

Organisationally shared beliefs and values can stem from the successful behaviour of individuals in the organisation (Baumgartner & Zielowski, 2007). Beliefs and values are not visible (Hock et al., 2015), but they are integral to strategies, goals and philosophies (Johnson, 1992; Schein, 2004). They manifest in the organisation's mission (Babnik, Breznik, Dermol, & Širca, 2014) and in the behaviour and perceptions of organisational members (Babnik et al., 2014; Dubruc

et al., 2014; Hock et al., 2015).

When analysing beliefs and values, it is important to note which ones are congruent with underlying assumptions and which are just rationalisations or aspirations instead of actual values (Schein, 2004). Over time, values are transformed into non-discussable assumptions supported by beliefs, norms and operational rules of behaviour (Baumgartner & Zielowski, 2007).

The deepest level of organisational culture is the underlying assumptions, which are unconscious, taken-for-granted beliefs, views, perceptions, thoughts and emotions (Schein, 2004). They conform the individual's mind-sets (Dubruc et al., 2014) and affect the individual's understanding of strategic issues as threats or opportunities (Fernández et al., 2003). This level is the most difficult, but most crucial to change in order to succeed in the change initiative (Clement, 1994).

To achieve success in an organisational culture change process, the insights provided by the organisational change management for CS literature need to be taken into account. It is thus necessary to take a step back and understand the inter-linkages between the fields of CE, organisational culture and organisational change management for CS. This leads to the development of a research framework that provides a holistic perspective into all of these aspects.

2.4. Research framework

Organisational culture and organisational change are inter-related fields. In the organisational change for CS literature, few authors have designed an empirical change plan to achieve an organisational culture more suited to CS. Following the example of the two authors that have done this, Alavi et al. (2006) and Donate & Guadamillas (2010), for the purposes of this research the desired organisational culture is conceptualised in terms of values that should support and promote the use of CE practices.

Because of the lack of research in the topic, a comprehensive list of CE-supporting beliefs and values cannot be found in literature. However, there are hints in the literature that values that support CE include: sustainability values (Preston, 2012) and environmental awareness (Liu & Bai, 2014), an affinity towards innovation and risk-taking (Genovese et al., 2015; Liu & Bai, 2014), closed-loop (Preston, 2012), long-term (Genovese et al., 2015) and holistic/system thinking (Ellen MacArthur Foundation, 2013b; Kok et al., 2013; Pitt & Heinemeyer, 2015). System thinking entails values related to high quality design (Pitt & Heinemeyer, 2015). By empirically establishing which values are perceived as supportive of CE, this research can contribute to fill an existing research gap.

To uncover espoused beliefs and values and underlying assumptions, behaviour (Baumgartner & Zielowski, 2007; Schein, 2004) and artefacts should be observed (Kopnina, 2015). Artefacts are part of the systemic aspect of the MuSIC memework (Figure 2), while behaviour is one of its levels. This highlights the relationship between the MuSIC memework (Figure 2) and Schein's organisational culture model (**Error! Reference source not found.**). Therefore, besides its intended

purpose, the MuSIC memework can also be used to uncover and to analyse organisational culture.

Artefacts can be analysed to uncover the deepest levels of organisational culture (Clement, 1994). According to Engert & Baumgartner (2015) and Baumgartner & Zielowski (2007), the pertinent artefacts include CS instruments and guidelines, goals and Key Performance Indicators (KPIs), the mission and vision, policies, objectives, compensation schemes, strategy and strategic decision-making processes, communication strategy, technology, business models, efficiency programmes, disclosure and reporting. Once these artefacts are analysed and the organisational culture uncovered, the organisational change management process has to be designed.

Uncovering change drivers is an essential step in this process. Since CE is a CS initiative, it is possible that previously uncovered CS drivers apply to CE. However, there are CE specific drivers that push and pull change towards a more circular organisation (Andrews, 2015). Even though CS drivers have been previously researched (see Lozano, 2013a), there is a research gap involving both a systematic literature research and an empirical study of CE drivers.

A specific analysis on CE drivers can be useful to design the organisational change process towards CE. Some CE drivers, like innovation, are also a CS driver. Other CE drivers, like waste reduction and materials and labour cost reduction are more explicit than related CS drivers. This facilitates their complementary use by grouping CE drivers under a more general CS driver. Therefore, for the purposes of this research, Lozano's CS drivers' model (Figure 1) is complemented with CE-specific drivers found in CE literature (Table 1). By putting these together, a new driver's model for CE is obtained (Figure 5).

Table 1. CE drivers, literature sources and related CS drivers

CE driver	**CE driver sources**	**Related CS driver**
Recycling policies	(Velis & Vrancken, 2015)	National government
Improve relationship with customer	(Kok et al., 2013)	Customer satisfaction
Attract new customers	(van Weelden, Mugge, & Bakker, 2015)	Access to markets and customers
Need to move towards more service driven models	(Moreno et al., 2014)	
Innovation	(Kok et al., 2013)	Innovation
Value creation	(World Economic Forum, 2014)	Profits and growth
Value capture from vertical integration	(Roos & Agarwal, 2015)	
Improve margins	(Linder & Williander, 2015)	
New business opportunities and revenue streams	(Andersen, 2007; Roos & Agarwal, 2015; Schulte, 2013)	
Reduce liabilities	(Rizos, Behrens, Kafyeke,	Precautionary

	Hirschnitz-Garbers, & Ioannou, 2015)	principle
Cutting waste	(Ellen MacArthur Foundation, 2013a; European Commission, 2014)	
Lower pollution	(Andrews, 2015; Ghisellini et al., 2015)	
Reduce environmental impact	(Linder & Williander, 2015)	Pollution and prevention
Reduce labour costs	(Murray et al., 2015)	
Reduce waste disposal costs	(Andersen, 2007; Ghisellini et al., 2015)	
Reduce material costs and materials use (efficiency)	(Andersen, 2007; Esposito, Tse, & Soufani, 2015; Ghisellini et al., 2015; Liu & Bai, 2014; Murray et al., 2015; Pitt & Heinemeyer, 2015)	
Reduce warranty costs	(Rizos et al., 2015)	Resources and cost savings
Reduce energy costs		
High and volatile resource prices	(Ellen MacArthur Foundation, 2013a; Kok et al., 2013; Linder & Williander, 2015; Moreno et al., 2014; Schulte, 2013)	
Resource supply threats and volatility	(Andrews, 2015; Ellen MacArthur Foundation, 2013a; Esposito et al., 2015; European Commission, 2014; Moreno et al., 2014; Pitt & Heinemeyer, 2015; World Economic Forum, 2014)	
Resource scarcity	(Kok et al., 2013; Moreno et al., 2014)	
Volatile or fragile supply chains	(European Commission, 2014; Ghisellini et al., 2015; Kok et al., 2013)	
Reduce supply dependence	(Kok et al., 2013)	Risks
Environmental stewardship	(Kok et al., 2013)	Ethics
Brand benefits from differentiation	(Ellen MacArthur Foundation, 2013b; Linder & Williander, 2015)	
Brand benefits from environmental leadership	(Roos & Agarwal, 2015)	Corporate and brand reputation
Increase brand protection	(Linder & Williander, 2015)	
Business opportunities for reprocessing	(Andrews, 2015)	
Reliable supply of recycled materials	(Andrews, 2015)	Future sustainability markets

Decreasing costs of establishing reverse supply chains	(World Economic Forum, 2014)	
New partnership opportunities with suppliers	(Roos & Agarwal, 2015)	Alliances and partnerships
Create new job opportunities	(Ellen MacArthur Foundation, 2013a; Ghisellini et al., 2015)	Social legitimacy

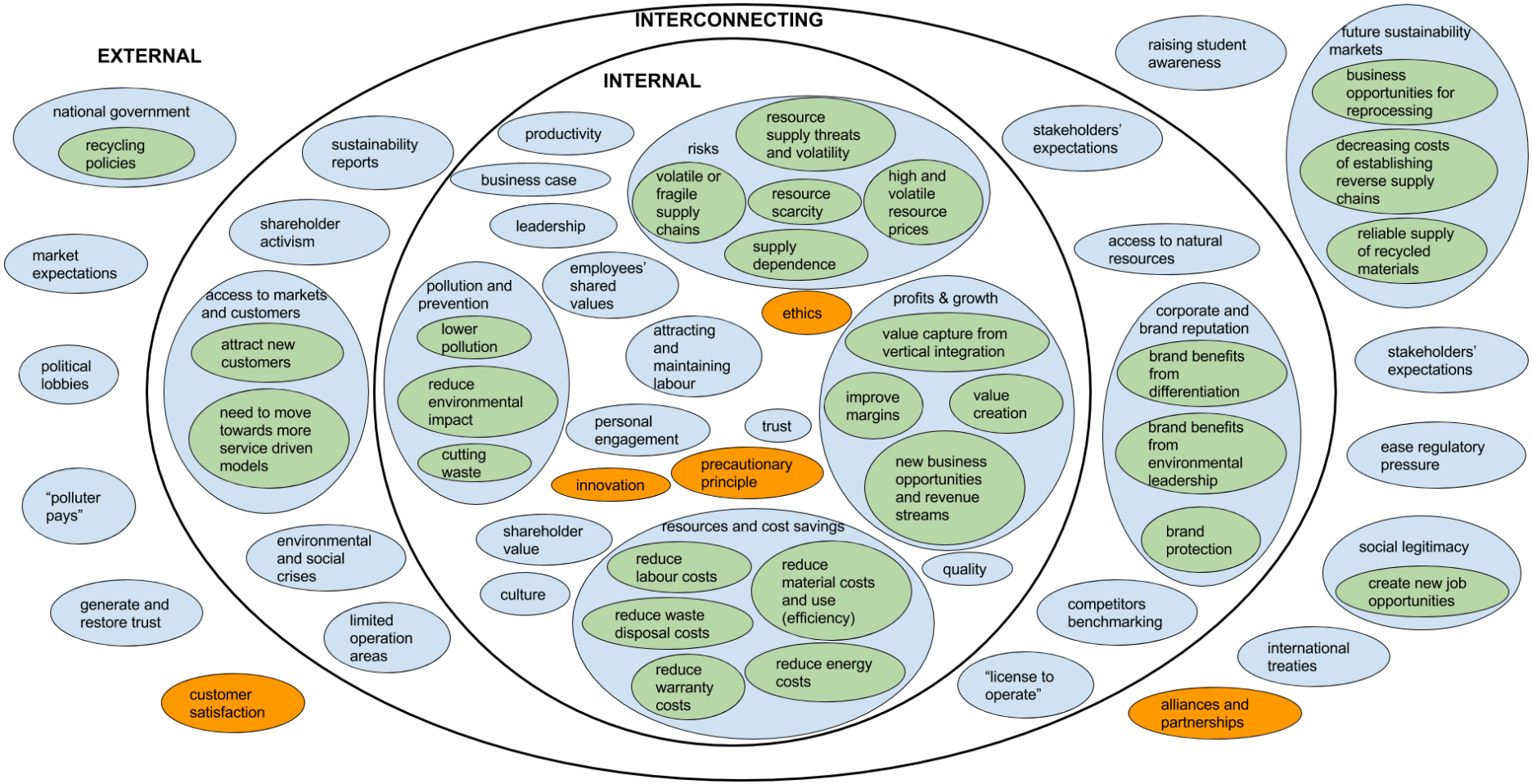

Figure 5. New drivers' model. Blue drivers are general CS drivers. Green drivers are CE-specific drivers. Orange drivers are both CS and CE-specific drivers. Adapted from Lozano (2013a)

In order to identify the necessary changes to incorporate CE in the organisational culture and to design the organisational framework guidance, the main RQ is formulated, "*What organisational culture changes promote the adoption of CE?*"

To determine which organisational culture changes are necessary for CE adoption, organisational change literature typically advocates 1) an analysis of the current culture, 2) identifying the desired culture and 3) developing a change plan to achieve the desired culture (Harris & Ogbonna, 2002; Lane, 2013). Even though Figure 3 was designed with a broader purpose than to achieve organisational culture change, the three steps are present there as 1) *status quo*, 2) more sustainability orientated state or *status quo novus* and 3) institutional framework guidance.

Additionally, the change drivers should also be taken into account in this process (see Figure 3). The relationship between drivers and organisational members' behaviour must be understood, as to better recognise the drivers' influences upon observable actions (Crittenden et al., 2011). Organisational values, such as environmental awareness (Liu & Bai, 2014), can also be a driver to CE, so CE change drivers (Figure 5) need to be assessed together with the organisational culture. This leads to the development of the following SQ:

SQ1. *What aspects of CE affect or could affect the organisational culture?*

SQ2. *How does an organisational culture influence CE adoption?*

SQ3. *What drives an organisation to adopt CE?*

SQ4. *How do CE drivers influence the adoption of CE in an organisation's culture?*

SQ5. *What have been the differences between current organisational culture and the culture necessary to adopt CE?*

Chapter 3. Methods

The broad topics that are researched within this thesis require an exploratory and qualitative approach. Qualitative research focuses on the content rather than on quantification of the data collection and analysis (Bryman, 2004). The chosen methods of qualitative research are a case study and grounded theory. These methods are discussed in detail in the next sections.

3.1. Data collection

A case study is ideal to extend the knowledge of complex phenomena such as organisational culture (Dubruc et al., 2014; Ying, 2014), as it allows "to focus on a 'case' and retain a holistic and real-world perspective" (Ying, 2014, p. 4).

The two main reasons to use a case study for this thesis are: 1) the limited amount of situations and individuals analysed within a case study provides a good understanding on how events, actions and meanings are shaped by their context (Maxwell, 2005); and 2) case studies allow the construction of incremental theory and are specially useful to gain new perspectives on a research topic (Dubruc et al., 2014), namely, CE drivers and the impact of CE on the organisational culture.

This research was undertaken in Engie Nederland (henceforth Engie), which until April 2016 was known as Cofely (Engie, 2016). Engie is the market leader in technical services and installations, including sustainable technological solutions for energy efficiency, asset efficiency and human comfort. It employs approximately 6200 people in the Netherlands (Engie, n.d.). Engie stated its desire to adopt CE but they have not yet engaged in it, except in some small-scale projects, making it a relevant case study for this research.

Engie is divided in several business units, namely West, Nord, Zuid, Energy and Infra&Mobility. The case study for this research was Engie Infra&Mobility. The focus of this business unit is to deliver infrastructural projects like bridges, tunnels and sluices. In the Netherlands, this business unit has around 350 employees, organised in different departments (Figure 6). It is characterised by servicing institutional clients, mainly the Dutch infrastructure agency Rijkswaterstaat.

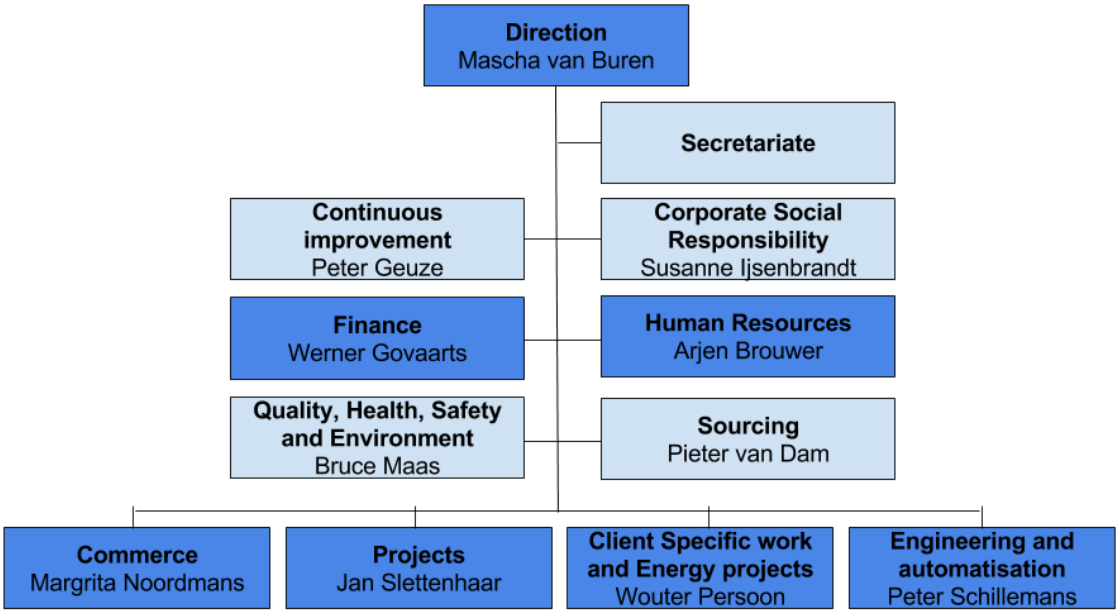

Figure 6. Engie Infra & Mobility organogram. The directive positions are highlighted in dark blue.

The total empirical database consisted of an array of documents from the organisation and several in-depth interviews with 12 interviewees. More information about those aspects of the research is provided next.

3.1.1. Organisation's documents

Several of the documents internal and private to the organisation were collected. The research framework provided a list of the documents that might be relevant in order to analyse the culture's artefacts. Among them are, for example, the yearly sustainability objectives and the introductory information for new employees, which informs them of the organisation's expectations and general objectives.

3.1.2. Interviews

The primary data sources are in-depth interviews. Qualitative interviews provide an approach that allows to detect issues not previously covered in literature (Campbell, Moy, Feibelmann, Weissman, & Blumenthal, 2004). Semi-structured qualitative interviews are used because of their flexibility and in-depth capacity

which allows to address pre-determined issues as well as follow-up questions (Harris & Ogbonna, 2002).

Engie employees were interviewed in order to uncover CE drivers and the *status quo* of the organisation's culture. These interviewees were selected together with the sustainability manager of Engie Infra & Mobility with the objective to get an overview over different departments and hierarchical levels that are representative of the organisational operations (see Table 2).

Table 2. Internal interviewees' information

Internal interviewees			
Interviewee	**Position at Engie Infra&Mobility**	**Work time in organisation**	**Job responsibilities**
A	Corporate Social Responsibility manager at Mobility department	3 years	Support in designing sustainable solutions, design CS strategies and objectives
B	Regional account manager	6 years	Sales. Find possible contracts and uncover client's needs to achieve a good starting point for the client's tender
C	Head of sourcing department	3 years	Aid in the selection of suppliers
D	Category manager– sourcing department	3 years	Manage supplier relationship with cable suppliers
E	Head of maintenance department for Zeeland region	12 years	Engineer the design, maintenance and service of infrastructure projects
F	Head of Innovation	2 years	New business opportunities and growth. Communication, internal and external.
G	Cost engineer – Commerce department	5 years	Create cost -price budgets and supervise project tenders during the whole process
H	Manager customer sales and new business	7 years	Sales. Find possible contracts and uncover client's needs to achieve a good starting point for the client's tender
I	Business developer – smart grid solutions	2 years	Project manager in the development of smart grids and smarter energy infrastructures
J	Head of Calculations – Commerce	2 years	Design tenders, including cost - price budgets and supervise project tenders during the

	department		whole process

An external stakeholder, the work wear supplier Intersafe, was used to uncover an external perspective on CE drivers and Engie's culture. This provides a way to triangulate the information provided by internal interviewees. Two interviewees attended the meeting, where each provided a unique perspective due to their different job responsibilities and the different nature of their relationship with Engie (see Table 3).

Table 3. External interviewees' information

External interviewees			
Interviewee	**Position at Intersafe**	**Time in contact with Engie**	**Job responsibilities**
K	Key Account manager - Intersafe	2 years	Handle the contracts with Engie
L	Category manager footwear & work wear - Intersafe	25 years	Direct the development and sales of products in the category for the Netherlands, Belgium and France.

Two questionnaires were used, one for the internal interviewees and one for the external interviewees (see Appendix 1). The interviews were semi-structured, to allow space for the interviewee to mention any additional elements that they considered relevant (Bryman, 2004; DiCicco-Bloom & Crabtree, 2006). The interviews ranged from 60 to 90 minutes and were recorded and transcribed to facilitate the subsequent data analysis.

3.3. Data analysis

The data was analysed using the grounded theory constant comparative method, where theory is developed through the continuous interplay between data analysis and data collection (Strauss & Corbin, 1994). With this method, literature can help to identify existing knowledge in the research subject (Bryman, 2012) and "to stimulate our thinking about properties or dimensions that we can then use to examine the data in front of us" (Strauss & Corbin, 1998, p. 44). This method consists of four steps that are explained next:

1. Data was categorised with the basic themes obtained from literature. The transcriptions of the interviews were coded with a qualitative data analysis (QDA) software package, Nvivo. This software enables the researcher to organise relevant information around entities called 'nodes'. The nodes used for the analysis of this case study were based on the theoretical framework developed in Chapter 2. The information was interpreted according to the different aspects of the MuSIC memework (Figure 2), taking into account Schein's three levels of organisational culture (Figure 4),

including the different CE supportive values and the list of CE drivers gathered from literature (Figure 5). The list of nodes used for the data analysis can be found in Appendix 2.

2. Categories and their properties were integrated. New nodes were inductively derived from the interview data. As part of the iterative coding process, when new concepts were discovered, previously coded interviews were analysed anew to uncover any overlooked evidence of the new node. This way, codes emerged both from the research framework and from repeated concepts or ideas in the collected data (Bryman, 2004).
3. Theory is derived from the categories. The data that is gathered within the nodes provides insights into the relationship of CE, CE drivers and organisational culture. These insights are developed within the discussion of the SQ in Chapter 4.
4. Theory was written and modified. The findings of this thesis lead to a proposed CE drivers' model and a description of the required changes to the organisational culture to adopt CE. These findings are developed within the discussion of the SQ in Chapter 4 and within Chapter 5. This provides a base for future research.

Due to the large quantity of ethnographic and interview data, not all raw data is presented in this thesis. Instead, several qualitative statements were presented in this document to serve as example in order to increase the transparency of the analytical process.

3.4. Scope, validity and limitations

Regarding the research scope, it should be noted that the research objective is not to make a detailed transition plan nor to list and analyse CE barriers. An innovation is institutionalised only after a long period of time (Lozano, 2006), so out of time constraints institutionalisation is also outside the scope of this research.

There are several factors that affect the replicability and generalizability of the study, like the reliability and validity of the findings.

3.4.1. Reliability and validity

Several factors can affect the case study reliability. Organisational change can be complex (Dawson, 1994), continuous, iterative and uncertain (Lozano, 2013b). Its research is difficult to unravel (Colyvas & Maroulis, 2015) as direction and tempo of organisational change is hard to predict (Lozano, 2013b).

Assessing the external validity of qualitative and ethnographic research is problematic, especially when small samples are used (Baker & Edwards, 2012). Case studies can never be fully and safely generalised (Bryman, 2004; Tsang, 2014; Ying, 2014), and their findings require further research to apply them on a broader scale. In this case, an added difficulty is that the number of interviewees is rather small. Therefore, the results of this research are valid for Engie Infra&Mobility, but broader application should be done with caution and taking into account the scope and limitations of this research.

A further limitation is related to the possible gap between attitude and behaviour. Especially when analysing environmental propositions, an interviewee might

express a more positive attitude towards a certain offer than they have in reality (van Weelden et al., 2015). The research is aimed at overcoming these limitations by triangulation, making use of several questions with a similar purpose in order to uncover any incongruences and using external interviewees to obtain an external perspective in the obtained data.

Several factors related to the organisational culture concept can affect the validity of the research. There are multiple definitions of organisational culture. This means that, had another definition of organisational culture been used, the results could have varied. However, the different definitions and values that conform organisational culture are just different tactics with which to capture a view of the complex concept of organisational culture (Lloyd-Jones, Lewis, & Eason, 1999).

3.4.2. Limitations

Data collection is limited by the design and structure of the questionnaire as well as by interviewee selection (Saunders, Lewis, & Thornhill, 2011), since different interviewees could have led to different results. However, using multiple interviewees mitigates biases and provides a broader insight into complex processes (Fawcett, Magnan, Bradlee, & Fawcett, 2008). Error and bias can also stem from limited interview time and from the possibility of prompting a specific answer through the follow-up questions (Saunders et al., 2011). Not mentioning specific drivers or aspects of organisational culture in the follow-up questions helps to mitigate this.

Data analysis is limited by the personal experience of the interpreter (Dilthey & Jameson, 1972) and by her knowledge. To diminish this limitation, the analysis process used NVivo to maintain the chain of evidence and to ensure the coding is precise and transparent. Precise coding helps to identify, develop, and associate ideas, and to build theory in a more systematic and creative way (Lozano & Huisingh, 2011). Transparency in the analysis process is ensured using quotes from the interviewees.

It should also be mentioned that English is not first language neither of the interviewees nor the interviewer. This could in certain instances have led to misinterpretations or misunderstandings that add a limitation to the study.

Chapter 4. Findings

This section presents the findings of the research. This Chapter presents the findings from the case study and organises them in several sections, aimed to provide clarity and order. These sections follow the logical order of the questions that were posed to the interviewees (see Appendix 1).

4.1. Organisational culture described by the interviewees

The corporate mission of Engie Infra&Mobility is “to contribute to a better world through sustainable technology” (Engie, n.d.). When asked to define the mission, the interviewees mostly mentioned the “energy transition” (D, J, B, F, I). For example, interviewee D defined the mission as “Being the partner for our clients in energy transition [to renewable energy sources]”.

Some interviewees mentioned both sustainable energy and sustainability itself as part of the mission (F, H, I). For example, interviewee I stated "Their [Engie] basic mission is to be leader in the energy transition, whatever that means. Comes down towards making an interpretation for that, right? But I think their basic mission is to, from a technology point of view, the services that we provide, make a better, more sustainable world". Other interviewees also expressed difficulties to understand the practical implications of the mission. For example, interviewee J said "We don't have any translation yet, let's say from our mission statement to what sustainability actually means for the company".

Two interviewees could not provide a definition of Engie's corporate mission (C, A). Interviewee C justified this by saying that "We don't have a real mission for ourselves, we just follow what the customer wants. […] Especially Engie Infra & Mobility we are struggling with our identity". Even though he claimed he didn't know the mission, interviewee C was nonetheless aware of it. He later stated "Now we have like a slogan, it's not the mission, but it's the slogan… innovative sustainable technology".

Two interviewees claimed the mission and vision statements should be changed (I, C). The organisational mission should highlight the commitment of the organisation to CE, according to interviewee C. He said "If our company really wants to have a sustainable image, our direction, our high above, should be more clear about that message, about that mission: "we always want something sustainable in our offers". But right now, I don't see that". He also declared that the mission should provide more information on the pathway to CE adoption. According to interviewee C, "The mission is not really clear. It should tell us what we are going to do exactly. For example, how are we going to be circular? […]It should be our mission. Our slogan says that we are a sustainable company. So our slogan should promote us to be more interested in CE".

Organisational culture was defined with a number of terms that, according to the interviewees, are shared by most employees (see Table 4). The most used terms to define the organisational culture were: 'risk-averse', 'traditional and slow moving', 'customer-focused', 'money-focused' and 'reactive'.

Three interviewees (A, F, J) mentioned 'sustainability values' as an integral part of Engie's culture. Other interviewees (E, D, L, K), even though they had not directly acknowledged sustainability as an integral part of the organisational culture, nonetheless mentioned that it is increasingly more important within the organisation. For example, interviewee E stated "But now [the last few years] it's more every time we send an offer, we have to think about it [sustainability]".

Several interviewees contradicted that statement. Interviewee H stated that "The people [at Engie] don't think sustainable". In the same line, other interviewees also indicated that sustainability is "perceived as extra" (F, B, C), only considered as per request of the customer (F, G, C, H) or that it is considered that "it does cost incredibly much more effort and knowledge to apply such things [CS and CE]" (G). Interviewee G also explained "We have projects that are based on the lowest price without a whole [sustainability] plan around it […]. Then you do not even consider these kind of terms". Interviewee C said that "If the customer wants sustainability,

we offer sustainability. If the customer wants the lowest price, we offer the lowest price [without sustainability]".

Interviewee I emphasises that there is a difference between Engie's external image and its organisational culture. He stated that "I see the 'duurzamheid verslag' [sustainability report] and I see the reportings [*sic*] about it. Sometimes I think it's more the outside of it, the image, than it's really our daily common daily business. So I think there's somewhere a mismatch there". He is not alone in that perception, as interviewees J and C also provided similar statements. According to interviewee C: "[…] [In] a managers meeting, they always say 'we are innovating, and we are circular, and we are busy with CE'. And that's it. Then they stop and everybody goes away and everybody is back to the normal way of work".

The external interviewees also declared that sustainability is not an integral part of Engie's organisational culture (K, L). For example, interviewee L said that "We talk about sustainability and CE [since a year and a half ago], but the people who should be, let's say, the game changers, I didn't meet them yet".

Table 4. Values that conform the general organisational culture of Engie Infra&Mobility

Value	Interviewees	Example quote
Risk-averse	(5) B, F, I, G, H	Interviewee B: "They're thinking, a lot of people that I speak think 'Ah, the new generation products, they don't work. Please, do your work as you always have done' […] A lot of risk, it's new […] It's scary"
Traditional and slow-moving	(5) D, J, H, I, B	Interviewee I: "A part of the job is still [done] very traditional, for very traditional clients"
Customer-focused	(5) E, C, G, B, K	Interviewee J: "And we're still […] very much driven to follow the needs of our clients"
Money-focused	(6) B, C, E, H, I, L	Interviewee I: "It's my feeling that those kind of choices [choices of design and supply] are not made on sustainability but most times are made just on money". Interviewee L: "[…] still so much cost-driven. […] that's the only project they choose. What do I pay now? What is your offer? What can I earn?"
Reactive	(5) C, J, H, F, B	Interviewee J: "We practically always wait until the client asks a question".
Friendly, social and enthusiastic	(4) C, J, A, D	Interviewee C: "How I would define the company culture would be as really friendly […] almost like a family, we are not very competitive"
Lack of accountability,	(3) C, D, G	Interviewee C: "When people make mistakes: 'that's no problem'. That's one

criticism perceived as finger-pointing		thing in the culture […] people tend to blame each other when things go wrong. Not in a hard way, not fight. But they are like 'he should have done that'"
Innovation-focused	(3) E, C, F	Interviewee E: "Infra & Mobility [culture] is more innovation and more interested in, for example, data than the other part of Engie [previous name of Engie]".
Short-term thinking	(3) E, C, B	Interviewee C: "We don't think in the long-term […] [even] risk management is project-oriented"
High-quality focused	(3) E, C, H	Interviewee H: "Something that everybody shares is that Engie always gets the job done, and they always get the job done right"
Sustainable	(3) A, F, J	Interviewee J: "Sustainability makes the culture of Cofely [previous name of Engie] different from others"
'Flat' and informal (lack of hierarchy)	(3) J, G, I	Interviewee J: "Basically everybody talks to everybody and funny enough most of the information actually between all employees is just spread from mouth to mouth"
Internally focused	(2) F, H	Interviewee F "[The culture is] very inside driven. A lot of meetings, all internal related"
Realistic and honest	(1) I	Interviewee I: "But I think people here are very… both feet on the ground. So very realistic, well, do what you say, don't make nice talks… really doing what you say"
Support for personal development	(1) A	Interviewee A: "I think [organisational culture is defined by] the support for personal development. That is a big thing […] and they coach you to do it"
Transparent and open	(1) G	Interviewee G: "[Culture is defined by] That openness, transparency"

All interviewees indicated that the employees' mind-sets or organisational culture should change in order to adopt CE. As interviewee G explained, "It has become so normal not to consider it [CS] that it will actually be very strange to consider it from then on […] it will require a different mind-set […]". Interviewee I explained "[CE] is more than just buying [CE] things. It's more like the way of life. So it's not that you can walk in a room with somebody and say '[do it]' […] It's about the mind-sets".

More than half of the interviewees asserted that organisational culture is the main or only barrier for CE adoption (B, H, C, E, I, J). The interviewees had not been directly asked this (see Appendix 1), but had instead been asked to provide other barriers to CE adoption besides organisational culture. For example, interviewee B replied "It's the soft, the mind-set. […] I don't think there are barriers […] [only] culture". Interviewee I said "[…] I think there's the biggest challenge: people getting motivated to change and doing this differently than the way they always did it".

Conversely, two interviewees stated that organisational culture was no barrier to CE (F, A). Instead, they referred to the lack of inspirational CE pilots or examples within the organisation. However, interviewee F also said that "I think there is a lack of knowledge, the mind-set, there is always a way out, […]. There is nobody at the end saying '[…] Why isn't it [CS and CE] in the project?'"

Interviewees I, A and G expressed that, for CE adoption, the organisational culture should not be as money-focused. Interviewee I stated that "I think it's a total different view on projects. When you look back, the money is the first thing people look at. And now [with CE] you are looking at way more aspects of a project". Interviewee A said "I think they [Engie's employees] must realise that there is more than material quality and the cost-price. There are things as responsibility of where the materials come from". These statements are also related to the need to have increase holistic thinking in the organisational culture.

Interviewees H and J highlighted the need have a more holistic-thinking and innovative organisational culture in order to achieve CE adoption. For example, according to interviewee H "[…] the customer is asking to really think about CO_2 emissions, about sustainability, about building differently. But we don't think enough about that, so I think we need to do more".

Other interviewees highlighted the need to change the reactive attitude of the organisation (B, J, F). For example, interviewee B stated that "We don't talk to each other. We have to talk more to each other. Not in the questionary [*sic*] phase, but in the phase in which the customer is still doing research […]. And then we go, proactively. I can hold a presentation there at the customer showing them what they need. We have to discuss early in the process". Interviewee J said that "innovative solutions, and thinking differently, thinking outside of the box, really starting the discussions with our clients about sustainability, even if our client says 'yeah, but I think the solution is this, so I want to have this', we should proactively start discussing it to our clients".

Other interviewees suggested changing the short-term thinking values (I, B), the lack of risk-taking values (B, F), the customer-focus values (J) and the internally-focused values (H). Several statements can be provided to illustrate this. For example, interviewee I said "Short-term thinking could really be a barrier [to CE]". Interviewee J referred to the need of changing the customer-focused values by stating "I also think we can do way more effort convincing the outside world that CE and sustainability is not something that we will do in the future, but something that is actually achievable already now […] And I think in that sense we're still a company following the needs of our clients too closely". According to interviewee

H “And I think the customer as ‘king of the building’ is not enough. We don’t do that enough […]. And we should think more of the product range. So then we have to enhance our performance, and the way we act and think on daily basis”.

Several interviewees mentioned the need to change employees’ assumptions that CS is expensive (D, H, C, J). For example, according to interviewee H: “[…] [employees] don’t see ‘sustainable is cheaper’. In the Netherlands is ‘sustainable is expensive’. That’s the problem”.

Interviewees also mentioned the existence of different sub-cultures within the organisation. Because by their very nature these sub-cultures cannot be generalised, their characteristics do not appear in Table 4, but are instead assessed separately.

4.1.1. Organisational sub-cultures described by the interviewees

When asked about the difference in CS perception by the different departments, two interviewees said that CE or sustainability “should” be interesting for everybody (D, I). As interviewee I said “I think it should be interesting for everybody. It can be interesting for everybody, but I’m sure not everybody is interested in it”.

According to most interviewees, different sub-cultures characterise the organisation’s departments (A, B, E, G, H, C, D). Interviewee C explained that “[…] the engineering department are people that always want to offer the best quality. And the sales department they just want to offer what the customer wants: the winning strategy. […] So we have some differences between… the company is not one, aligned”.

The engineering department was mentioned as the group with a most differentiated sub-culture. Regarding sustainability values, Interviewee A believes the engineering department is especially sustainable: “The group of engineers and of pre-realisation employees are enthusiast [about sustainability and CE]. The realisation people are less […]”. They also have been depicted as lacking both an innovative mind-set (B, H) and holistic-thinking (G, E, J). As interviewee E, an engineer himself, stated “But engineers are a different group. They think in ‘blocks’ […]. It’s not part of their normal daily thinking”. Interviewees H and C also described engineers as a group that tends to offer a high-quality solution, irrespective of the client’s actual needs.

The sourcing department has a specific sub-culture. Regarding sustainability values, interviewee A stated, “There is one group that is not so enthusiast [about sustainability], that is the sourcing people. How to buy sustainable. That is difficult”. Interviewee D, who works at that department, disagreed: “[sourcing employees] are the most open department for that [CS and CE]”. Interviewee C, who also works at the department, described the department as reactive. He said “And whatever that [winning strategy for the project] is, we from procurement translate that into a procurement strategy. So if that tender strategy contains something about sustainability, we will translate that into procurement. […] So we are really in a reactive mode”. They also have been described as specially quality and money-focused (A).

The sales department has also has a specific culture. Regarding sustainability values, interviewee A believed that "The sales people are also enthusiast [about sustainability]". However, interviewee B recognised that "[sustainability] is not the hot topic in sales". Other value that defines this department is that it has more customer-focus than other departments (C).

Instead of different sub-cultures characterising the organisational departments, a few interviewees wished to point out that most differences on values and beliefs depend on the individual characteristics of the employees (J, B, H). These differences were partly accounted for by age, where older employees lack holistic thinking (J) or innovation-focus (B, H). According to interviewee J, "between the old and new generation, you could say in the company most of the old generation still thinks the old way [lack of holistic thinking] […] So then, if you put those people next to somebody that basically puts the whole puzzle together and looks at the total solution, […] I think that is maybe even a stronger solution". For interviewee B, older people "think from the past".

Instead of differentiating sub-cultures by departments or age, interviewee A, D and C, referred to different organisational sub-cultures that depend on the position of employees in the organogram. There were several references that the different business units within Engie have different sustainability values. For example, according to interviewee K, "There's other view [about sustainability] in West Industry than for example people who work by the Shell department in Amsterdam […] I think the demands [for sustainability] for every business unit at Engie are different […] because they have different customers". In that regard, interviewee K defined the case study, Engie Infra&Mobility as more sustainable than the rest of the business units, due to the higher CS demands of this business unit's client, Rijkswaterstaat.

Interviewees perceived differently the amount of support CS has received by the employees at leadership positions within the organisation. On the one hand, interviewee D explained that "sustainability is a focus point of the company, in Paris [headquarters]" and interviewee E perceived that "sustainability goes from the top-down". On the other hand, interviewee C claimed that sustainability is not a strong point "in Paris" because "[they know that] customers are not willing to pay more for sustainability".

Similarly, at the national level, and according to interviewee D, employees working at the national headquarters are more concerned with CS than the rest. However, interviewee B disagreed with that statement and claimed that, among the employees in leadership positions, CS was only ever brought up by the Corporate Social Responsibility director. This statement is reinforced by interviewee F, who stated, "When you are an engineer or a person in the organisation that never talks to Susanne [the CSR director], then I think it's never crossed the minds of people". Interviewee C incised "Because in Engie, direction says yes [to CS], but the business says no. The people that are doing the real work, […] they are stubborn […] they have bigger objectives, like their project has to be profitable, and time, planning, quickly. They don't feel it's their goal, their objective. They don't feel committed". Interviewee J, who initially agreed that employees at leadership positions displayed sustainability values, remarked: "[…] you could say that some

individual bosses in the company actually have a negative impact [on CS adoption] on the people that work under them […]. With different bosses with a different mind-set, we would achieve much more".

The employees that are at the lowest positions in the organogram have been described as the less aware of sustainability (I, A, D, F, C). As interviewee A explains "And the people that work outside in the projects, that is it's far from their job for them". Interviewee C provided another example: "Because executive teams talk sustainability, and you go one level down, they don't talk about sustainability. They talk profitability".

4.2. Role of CE within the organisation according to the interviewees

To define CE, most interviewees used the words "reuse" and "recycle" (J, B, E, C, A, H). For example, interviewee J said "Basically it [CE] comes down to reusing, recycling materials as often as possible […] the business model is completely different". Only interviewees B and J mentioned the use of new business models when defining CE, and only interviewee F highlighted the objective of CE being that "the assets live longer".

Interviewees D and F believed that employees not directly involved with CE or CS would not know the meaning of CE. Conversely, interviewee J believed there is an awareness of the CE concept. He said "I think also our people are more aware of the problem, or more aware of CE, so I think waste materials get reused in our company, instead of throwing away, for example".

There was considerably less consensus on the interviewees' perceptions on how CE applies within the organisational context and the organisational system. Interviewee L highlighted the lack of knowledge about CE in Engie as well in his own organisation by saying "[…] what is circular and what is not. […] that's the level of the discussion we are still in". Some interviewees did not know the role of their job position in adopting CE or how to do it in practice (J, D). Interviewee J said "I think there's nothing too much to be done about sustainability and CE if you look strictly at the price [my job]. But on the other hand we have a lot of influence on the solution". According to interviewee D "But really, I think the focus is: 'OK, this supplier is the best in sustainability'. I don't know where to mention it, the organisation is that big".

CE information should be tailored for every department and incorporated into a CS vision for each of these departments (B, C, J). For example, according to interviewee J, "I think if there would be a ranking for sustainability and they have two suppliers, […] and one is clearly more sustainable than the other, of course we would choose the more sustainable one. But I think the information is not there. There's also no urge basically to generate that list of who is more sustainable than others".

Most interviewees agree that CE adoption would require rethinking Engie's design and engineering practices (J, B, F, I, G). Interviewee J said "[…] connecting all our clients, or all our suppliers and our clients within that circularity model, and by working together with our sister companies, and […] with our recycling factories". According to Interviewee I, "The first steps that you take in CE is in product

developing, and in thinking what do we do with the product when it's end of life. Or what can you do to extend the lifetime. To that extent, we can only do that much, but you can choose from different products. And again, you use the Total Cost of Ownership, and you can do Life Cycle Assessments on that… That I think is something we should do, and not only in the projects we are doing for our customers but also for our internal processes".

According to interviewees E and J, the engineering practices occasionally take up CE initiatives such as reuse, refurbishment and the use of longer-lasting products. Regarding longer-lasting products, interviewee E stated that "When we have a contract for 20 or 25 years, and we have to build it and maintain it, it is for us a better solution [to have assets that last longer] […] in the beginning it's more expensive, but in the end it's cheaper". Interviewee E also said that Engie practices refurbishment. He said "Then we take it [old assets] as a spare. Because we have many contracts. For parts, a broken camera here with broken glasses, but the motor of it, the mirror is good. […] Then we can put the mirror in there [other project]". Regarding reuse, interviewee J said that "what we actually did in this case was actually export it to another company. I believe this one went to Brazil to actually be reused over there".

Other interviewees place the focus of CE adoption in the use of CE suppliers (C, A, D). As interviewee A explains, "Maybe in our business […], it's [about] the lightning and tunnels, for example. […] We can make deals with Phillips […]. And is it for Phillips to make the kind of lamps that they can reuse endlessly". Placing the focus on the use of CE suppliers is not completely unrelated to adopting CE within the design process. According to interviewee D, "[To use a CE product, the employees] first need to have an experience with that. They are not using a new product because there is a new product. First they need to have a first pilot or so, and then, when they have an experience, they probably will use it a second time as well". Interviewee D declared that there is other change to the mind-set of Engie's is necessary for Engie to use CE suppliers. She said, "There's project management, there's engineering, there's calculation and business operations, that should be informed about the suppliers and seeing the suppliers as a partner, and looking together for solutions".

Other interviewees recognised the need to both use suppliers with CE products as well as to take up CE propositions in the asset design, such as reuse and refurbishment of objects (E) or to ensure recyclability (G) and easy disassembly at end-of-life (I).

Interviewees also suggested CE implies changes to the role of the organisation in the value chain, where Engie becomes the service provider, asset owner (B), asset manager (F, D), or the technical integrator of several clients (I, J).

4.3. CE drivers recognised by the interviewees

All interviewees agreed that CE is relevant for the future of the company. The main reason is that its adoption is seen as necessary to respond to market changes (J, I, B). Interviewee J explained that the market is changing to take into account the expenses during the whole lifetime of the project. Interviewee I claimed that one prospective client assured him that they would only become a client if the

circularity of the asset is guaranteed, since "within a few years [they] won't buy anything that is not circular made". Other reasons provided by the interviewees are that CE is a natural evolution of the existing sustainability culture (A) or of the desired sustainability culture (H). As interviewee H explains, "As a sustainable company, I think it should be in our roots to think about the CE".

When interviewed further, some interviewees provided contradicting statements to those provided above. Interviewees F and H did not think that market expectations make CE relevant for Engie. According to Interviewee F, "I don't think the market is asking for it […] Most of the changes happen when it's urgent, when there is a real problem". Also, according to Interviewee G, "[…] there is no intrinsic motivation [to adopt CE]".

Other reasons why CE is deemed relevant by the interviewees are depicted in the CE drivers they mentioned throughout the interviews (see Table 5). In total, the interviewees identified 15 internal, 4 interconnecting and 3 external drivers. These can be observed in Figure 8.

The main external driver is 'customer satisfaction'. Within their statements, interviewees made an emphasis on meeting current customer demands (G, A), future customer demands (I, J), portraying a good image towards the client (E, F), or "[the client] has less costs, and we use our products again" (E). Only interviewee H did not mention 'customer satisfaction' as a CE driver. He said, " It's also not very interested by our clients, because clients do not think in CE". The driver 'alliances and partnerships' included only mentions to the suppliers. For example, interviewee C said that "The suppliers are offering it". Interviewee G disagreed with this statement: "What we see from suppliers is that if you do not ask, it is not offered either".

The interconnecting driver that was mentioned the most by the interviewees is 'competitor's benchmarking'. This was also the second most mentioned driver by the interviewees overall.

The main internal drivers are 'ethics' and 'business case'. Regarding the driver 'ethics', the references the interviewees (F, I, E, H, A) made indicate an engagement with sustainability values at the individual level (see Table 5). For example, interviewee A mentioned "We are all responsible for the way of life we live in", and interviewee E mentioned that CE should be taken up " […] for the future of our children".

External interviewee interviewee L stated that, in his experience, the only change driver for Engie has been obtaining monetary savings or other monetary rewards. He further proceeded to link other drivers, such as 'environmental protection', to the existence of a 'business case' that subsequently 'improve margins'. For example, he said "And then they say 'we choose a t-shirt that lasts two years instead of one year, so we chose to have a more durable solution' Yeah, come on. Durable is only cost driven [because that t-shirt costs 7.5€ per year instead of 10€ per year]".

Some drivers overlap. For example, the driver 'resources and cost savings' overlaps with 'improve margins' and 'business case'. Interviewee E stated that at

the engineering department they already take up some CE activities such as reuse of assets or parts of assets wherever possible. The main reason is that monetary savings obtained make the practice attractive for the company, even though material savings could also be an influencing driver in the decision (see Table 5).

Table 5. List of change drivers for CE adoption within Engie

External drivers	Interviewees	Example quotes
Customer satisfaction	(11) D, E, B, J, F, C, I, A, G, H, L, K	Interviewee G: "It is more a demand from the government to think along with them about that [CE]"
Market expectations	(3) A, B, J	Interviewee J: "If a client wants […] sustainability improvement, one of the first companies that comes to their minds is Engie, simply by the way that we do marketing and the references they have, of other projects that we do"
Alliances and partnerships	(2) C, D	Interviewee D: "[Another reason to take up CE is that] The suppliers are offering it [CE]. They are coming to us with new innovations, with the way they are looking at the future, how they can do that"
Interconnecting drivers		
Competitors' benchmarking	(6) A, F, E, H, I, D	Interviewee D: "[CE can] give us added value to our customers, in comparison to our competitors"
Corporate and brand reputation	(3) C, F, I	Interviewee C: "[adopting CE] it's about image, I think"
Attract new customers	(1) E	Interviewee E: "I think a few companies will choose for Engie because of this [showing to the customers that Engie takes up CE]"
Need to move towards a more service-driven model	(1) B	Interviewee B: "If you look at the biggest changes of the government, they are sourcing everything out. […] they are looking at multinationals like us to take the whole asset [and offer them a service]"
Internal drivers		

Ethics	(5) A, F, E, H, I	Interviewee I: "[The reason to take up CE is that] You have responsibility for the world as well".
Business case	(5) E, D, J, L, K	Interviewee D: "[CE] will bring us in closer contact with the customer, so we have more opportunities to sell other things to the customer"
Leadership	(4) C, E, F, J	Interviewee E: "who every time tells it, preaches it [about sustainability and CE] and gives us a look in the future is Susanne [CSR employee]"
Improve margins	(4) E, H, L, K	Interviewee E: "You have less costs, and we are using our product again. It's a winning situation".
Reduce environmental impact	(3) E, I, J	Interviewee J: "[…] we are using more new basic materials than we are actually recycling. Everybody knows that business model is broken towards the future"
Culture	(2) A, F	Interviewee F: "I think it's a culture thing that we have it and we want to be busy with sustainability"
New business opportunities and revenue streams	(2) B, J	Interviewee J: "what we actually did in this case was actually export it [used equipment] to another company. […] And it has value again […] they could not afford new equipment, but they could afford second-hand equipment"
Resources and cost savings	(2) H, B	Interviewee H: "The way that I look at it is that CE makes things not only cheaper but also gives us the possibility to do things better"
Reduce materials costs and use	(2) E, J	Interviewee J: "So that's really a situation in which everybody is getting better from it, because we're not wasting material"
Personal engagement	(1) E, A	Interviewee A: "We are all responsible for the way we live in"

Employees' shared values	(1) A	Interviewee A: "[Employees at Engie] They are interested and concerned about the environment"
Attracting and maintaining labour	(1) I	Interviewee I: "[…] looking at when you want to attract new employees, […] looking at a lot of people our age, a lot of them are interested in these topics [like CE]"
Quality	(1) H	Interviewee H: "The way that I look at it is that CE makes things not only cheaper but also gives us the possibility to do things better"
Value capture from vertical integration	(1) B	Interviewee B: "We deliver energy, we make services, transporting energy. And we also build the on-shore and off-shore market of windmills. […] We can take a bigger piece of the cake"
Lower pollution	(1) H	Interviewee H: "[the reason why CE is relevant is that] I think that the technology push as we know it now, and it's mostly in electronics, phones, computers, is so fast and cheap and pollutioning [*sic*] our world"

External interviewees K and L also mentioned the CE drivers that affect their own organisation, namely 'customer satisfaction', 'ethics', 'business case', 'create new job opportunities' and 'environmental stewardship'. For example, interviewee K said "For Intersafe it is also to please the customers, to get answers on their question", whereas interviewee L added: "For us it's also business case, of course". With this, he acknowledged that for his organisation the drivers for CE adoption are equally subordinated to the expectation of future economic benefits.

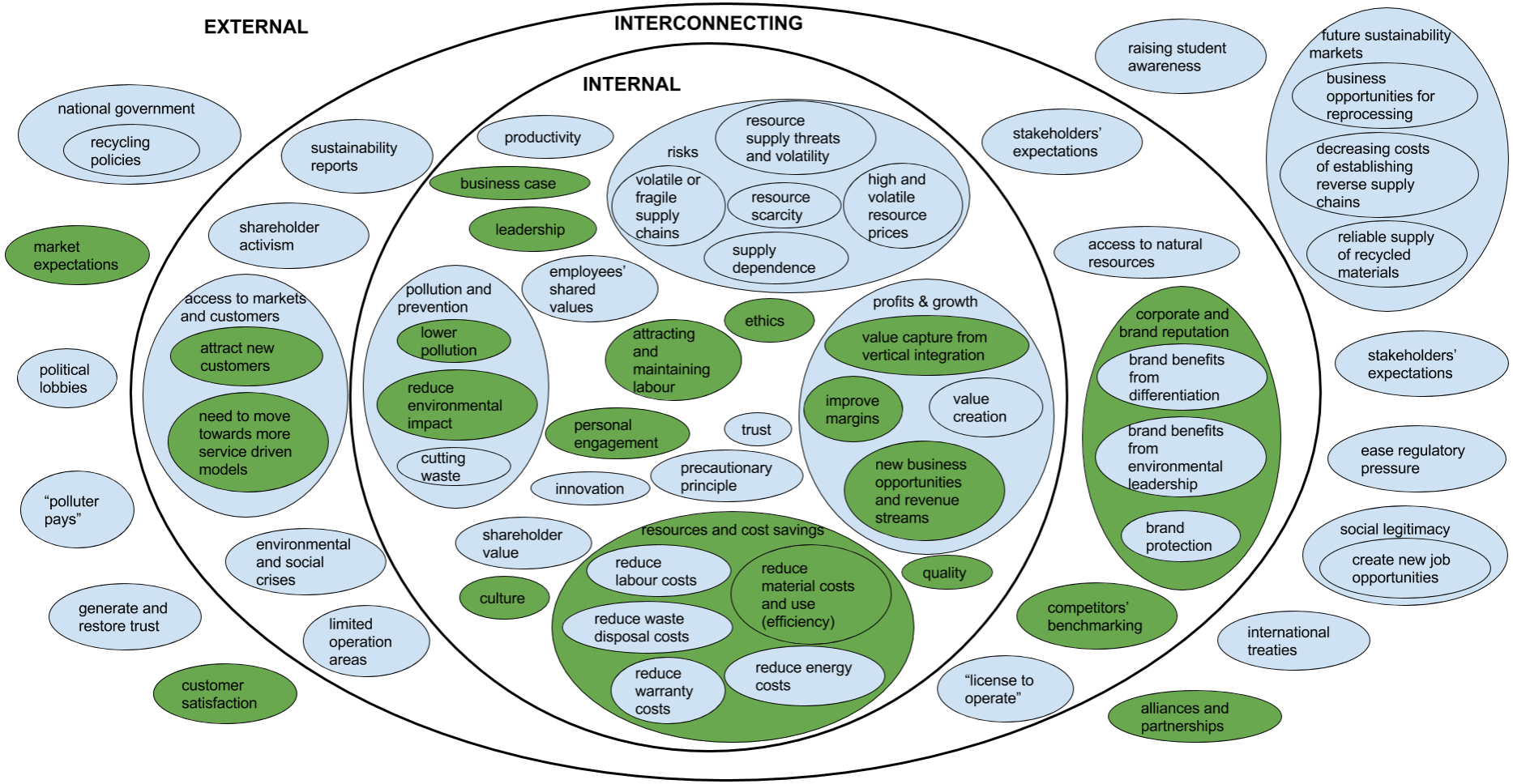

Figure 7. CE drivers mentioned by the interviewees (green). Adapted from Lozano (2013a).

In order to triangulate these findings, the interviewees were also asked to briefly list drivers for CE adoption for Engie's clients, namely Rijkswaterstaat and other governmental institutions. These are described in Table 6. There are 3 external drivers, 3 interconnecting drivers and 8 internal drivers. In this case, no driver appears to dominate over the rest.

The main external driver for Engie's clients is 'stakeholder expectations'. Among the external drivers, 'customer satisfaction' cannot be differentiated from 'national government' in the statements provided by the interviewees, that referred to Rijkswaterstaat both as client and as governmental agency (see Table 6). For example, according to interviewee A "The Dutch government makes an agreement to make sourcing sustainable [for Rijkswaterstaat]. They must have sustainable sourcing and as part of it they explore what circularity can do for them".

The main interconnecting driver is 'corporate and brand reputation', closely followed by 'competitors benchmarking'. There are three internal drivers that are equally important: 'reduce materials' costs and use', 'business case' and 'resources and cost savings'.

Table 6. List of perceived drivers of Engie's clients

External drivers	Interviewees	Example quotes
Stakeholders' expectations	(2) G, A	Interviewee A: "[the client's interest in sustainability and CE] is NGO provocated [*sic*]"
Social legitimacy	(1) G	Interviewee G: "It is of course important that, which reaches the news more and more, when a threatened animal or plant is found, a project is simply paused"
Customer satisfaction / National government	(1) F	Interviewee F: "Rijkswaterstaat [is government controlled, so it] is only doing it when the minister is asking for it, when there is a governmental thing. When there is a new rule, or… I think when the ministry wants it, and the minister wants it, Rijkswaterstaat has to do it"
Interconnecting drivers		
Corporate and brand reputation	(3) C, I, G	Interviewee C: "For the client, Rikswaterstaat, it's the image […]. They really have to work on their identity. So for Rijkswaterstaat it's about the identity"
Competitors' benchmarking	(2) B, E	Interviewee E: "The government also wants to be the best 'boy of school', as we say. So that when

		The Netherlands are united in Brussels, we are always one step ahead. Always better"
Need to move towards a more service driven model	(1) B	Interviewee B: "If you look at the biggest changes of the government, they are sourcing everything out. […] they are looking at multinationals like us to take the whole asset [and offer them a service]"
Internal drivers		
Reduce materials' costs and use	(3) B, E, J	Interviewee B: "Another thing is that they [the client] want to save raw materials. That is one driver"
Business case	(3) I, G, L	Interviewee I: "I think it can be, at the end, the financial incentive. Because again, looking at total cost of ownership, and saving fuels or gas or electricity, at the end it can save you money"
Resources and cost savings	(3) E, J, G	Interviewee G: "And the reason why the government [the client] does that, is of course money. So that you need to remodel less in the future and have lower costs"
Quality	(2) G, E	Interviewee E: "quality is also interesting for them [the clients]"
Improve margins	(1) E	Interviewee E: "For the clients… [the driver is that] they want to improve their margins"
Lower pollution	(1) E	Interviewee E: "Also the clients think about lower pollution, […] and they ask: 'What do you do about environment? What do you take care of?'"
Profits and growth	(1) I	Interviewee I: "I think it can be, at the end, the financial incentive. Because again, looking at total cost of ownership, and saving fuels or gas or electricity, at the end it can save you money"
Reduce environmental impact	(1) G	Interviewee G: "[Because of the client's demands] We are not only working on generating energy, but we also look more often at flora and fauna"

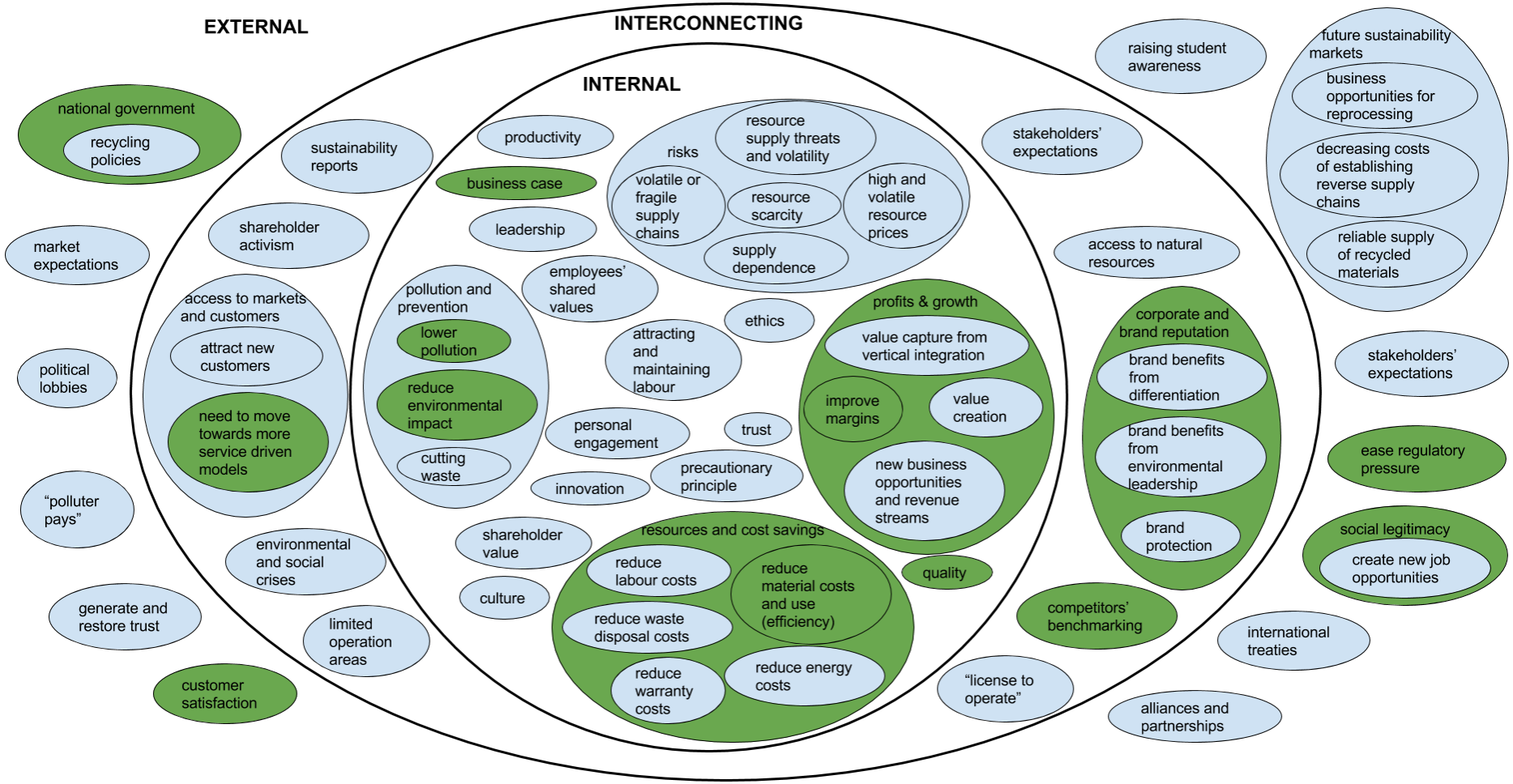

Figure 8. Client CE drivers as perceived by Engie employees (green). Adapted from Lozano (2013a).

4.4. Artefacts recognised by the interviewees

Interviewees were asked about the organisational artefacts, including CS artefacts, in order to provide additional insights on the organisational culture and on the organisational systems where CE would need to be adopted.

In January 2016, policy intended to increase reuse and recycling of materials at the end-of-life was created and, recently, general CS policies for every project have been developed (A). However, several interviewees (C, J, G, I, H) declared that there were no policies or documentation to guide them on CS, let alone CE. For example, interviewee H said that the only policies are "[…] soft guidelines. So we have posters everywhere 'think twice about printing', it's in every email […], we are just more or less following the market".

Several interviewees stated that current organisational policies represent the organisational culture (E, F, J, C), but that policies would have to change to face the future threats and opportunities of the organisation (I, B, E, G, H, C). For example, according to interviewee G, "People have the tendency to keep working in a certain system. Some documents are quite pretty long, quite extensive, quite detailed. […] So they make their own Word- or Excel-document and avoid using them. And that still happens too often. So the use of those documents should actually be enforced more".

The interviewees were asked to provide the main objectives for the organisation (see Table 7). As it can be observed, few interviewees mentioned CS objectives when they had not been explicitly asked about them. When explicitly asked, several of the interviewees admitted that there are CS objectives or KPIs (B, E, F, G, H). For example, interviewee G claimed that "[CS objectives] are indeed already considered, but have not yet been standardised into our processes". Interviewee B claimed to have sustainability objectives "but not formally, in a contract. We have to create that". Similarly, interviewee H has CS objectives "but not in numbers". According to interviewee C, this is a problem for CE adoption, since "[…] we still see it [CE] as something extra, because it's not within the core goals of the company".

Table 7. Organisational objectives described by the interviewees

Engie's objective	Interviewees	Example quotes
Be the leader in the energy transition	(4) D, I, J, A	Interviewee D: "That's [the objective] growing in the energy transition, in different market segments"
Growing or being the market leader	(4) B, E, F, C	Interviewee E: "be in front, lay ahead because of the data information"
Increase profits	(3) B, H, J	Interviewee B: "Making more money [is an objective]"
Become energy neutral in 2050	(2) F, H	Interviewee F: "We want to be energy neutral by 2050"

Become total project and asset manager	(2) D, B	Interviewee D: "[…] [an objective is] becoming more the designer and total project manager […]"
Being the innovating partner for customers	(1) D	Interviewee D: "[An objective is] Being the sparring partner and the innovating partner for our customers"
Obtain more revenue from customers by focusing on services, maintenance	(1) D	Interviewee D: "[…] changing from a lot of projects to focus more on services and maintenance"
Achieve a more varied client portfolio and more sustainable propositions	(1) F	Interviewee F: "We want to widen our client portfolio, and widen our product portfolio with more sustainable propositions"
Contribute to the mobility network of the Netherlands	(1) H	Interviewee H: "And the other one [objective] is to contribute to the mobility network in the Netherlands so that we, as a country, stay attractive for cargo transportation companies"
Sustainability	(1) A	Interviewee A: "I think sustainability is one of them [the objectives]"
Become the technical integrator	(1) I	Interviewee I: "[…] connecting the clients with each other. Clients on urban space, how can they work together. We can be the technical integrator there"

Still, several interviewees claimed not to have CS objectives or KPIs (J, C, I, D). For example, interviewee J said "The hard objective is more like the amount of work that we sell, the amount of turn-over that we generate. Very financially driven […]. Specifically for sustainability there are no strict objectives, at least not for my team".

When existing CS objectives and KPIs were pointed out to the interviewees, they mostly justified their previous answer by highlighting the ineffectiveness of current objectives. For example, interviewee J said "You could say that's more used like an analysis… yeah… you fill in the form and you say 'a project is sustainable, yes or no?' Does that influence the decision? Maybe in very rare occasions, but I would say normally not". Interviewee C similarly explained "[The objectives] say 'we are going to be more sustainable'. That's how it is right now, it's not more concrete than that".

According to interviewee L, several objectives are a barrier to CE. He said "[…] in the end, the buyer [the sourcing employee] has to buy the product. He has a different goal to reach. And I think that works counterproductive. Because some people say 'We want to be sustainable, we want to investigate CE, we want to invest in CE, or sustainability'. But in the end, the people who have to buy the product, at the suppliers, has another goal to reach every year, and it's to go down, to buy cheaper, to push the profitability of the company".

New CS and CE objectives would increase accountability and commitment (G, I, H, B, C, E, K, L). These objectives should be formal and concrete (H, C, B, E). For example, as interviewee H explains "That's a real objective [a numerical objective]. And that's really reshape, force people to rethink the way they work". Interviewee I similarly indicated that "When such a project manager has a goal to… I don't know, to at least use three of the ten suppliers he's using sustainable suppliers, then he will make another decision than he is making now […]. I think goals can help to change the mind-set". Similarly, interviewee K declared "If you make it hard, you make it visible and then people believe it".

Other interviewees disagreed with these statements. For example, for interviewee J "I think the most [challenging is the] awareness and the mind-set, […] I think that's more the mind-set of the people and about culture and motivating everybody to be more sustainable, also inside our company. By the way this company works I don't really think that writing down something actually helps in really changing something with the people".

A clearer division of the role and tasks of every department for CE adoption is also considered important (F, B, G, C, D). For the role of the sourcing department, interviewee C stated that "Sustainability is a goal, but when I read it, for me it's not concrete enough to really do something with it. It's not like 'this is so concrete I know what to do'. It's too general still. I think it should be more concrete, from the procurement perspective". As for the role of business developers, interviewee J suggested some necessary changes: "Our way is more focused on the solutions or what we think is the more sustainable solution and then we find the supplier for it. But you could turn around that model and say 'let's look for the more sustainable supplier and let's say what solution he offers'".

4.5. Additional requirements to adopt CE in the organisational culture according to the interviewees

Five interviewees deemed that it is necessary to increase communication on CS and CE initiatives in order for the organisational culture to adopt CE (B, J, F, C, K, L). The information to be communicated across the organisation should include basic notions on the CE concept (the preferred approach of interviewees E and H) and on its successful use within pilot projects (the preferred approach of interviewees F, A, C, D, G). For example, interviewee C said that "As soon as you have arranged that, you succeeded [with the pilot], then the culture starts changing".

According to interviewees G and C, CE support by the employees at leadership positions should be better communicated throughout the organisation. Interviewee C stated that "Infra & Mobility direction, our general director, and the people right below her, the management team, they should really communicate. If,

if, they want to do something with CE, they have to bring the message, and they have to be congruent, so not just say it, but act". Interviewee L corroborated this by stating "I think it should start from top level. […] To show the people how important is that Engie finds the fact of sustainability belongs to their company. And try to get it all through all layers in the company".

Interviewees H and J had the opposite opinion. They highlighted the necessity to have first movers among the employees' colleagues. For example, according to interviewee J, "I know that most of the people in this company get influenced very easily by their colleagues. […] I'm quite sure that the others will follow. Simply because they don't want to be lagging behind their colleagues. So I think what is most important to really make a change is really start with a small group of believers and start changing things".

Other requirements for CE adoption are that CE and CS should not be seen as "something extra" (C, B), and that the information on innovative and circular products should reach the engineers, and not only the sourcing employees (D, F).

Chapter 5. Discussion

This chapter discusses the case study findings and compares them to the literature review. The research sub questions are used to organise the findings section and to ultimately provide an answer to the main RQ.

5.1. Sub-research Question 1

The first SQ was "*What aspects of CE affect or could affect the organisational culture?"* Organisational culture has been characterised by most interviewees as the most important aspect to be taken into account for successful CE adoption. This is consistent with literature, that had already suggested that organisational culture should be taken into account (Appelbaum et al., 2016) as it could be the biggest barrier or driver for CE adoption (Fernández et al., 2003; Hock et al., 2015; Naqshbandi et al., 2014). In this case, the interviewees have depicted organisational culture as the biggest barrier for CE adoption.

The interviewees characterised CE mainly as a tool to achieve reuse and recycling, ignoring other aspects that make up CE according to literature, like economic growth and renewable energy (Prendeville et al., 2014). However, to describe the required changes for CE to be taken up by the organisation, many interviewees mentioned other aspects of the CE definition by Murray (2015), such as the role played by the procurement department and the production system, which in this particular case consists of the engineering design and process. This suggests that interviewees are mostly aware of the meaning of CE and of the role CE plays for the organisation.

It should be highlighted that, when defining CE, no interviewee mentioned that it is a tool for energy neutrality, even though that is a key aspect of the CE concept (Ellen MacArthur Foundation, 2013a). This is particularly relevant because, as the findings show, Engie's mission and objectives are deeply focused in achieving energy neutrality and CO_2 emissions reduction. Similarly, some of the other objectives, like being the technical integrator or selling more services and

maintenance are in line with the type of CE activities and business models that would be supportive of CE (Lacy & Rutqvist, 2015; World Economic Forum, 2014). Organisational culture would be more supportive of CE if employees had realised that CE adoption is coherent with the organisational culture (Dubruc et al., 2014), as it is a tool that aims to achieve energy neutrality and that focuses on service- and performance-based models (Lacy & Rutqvist, 2015; World Economic Forum, 2014).

CE adoption requires the use of suppliers that can provide assets adequate to CE propositions. To use these assets, the mind-set of the employees needs to change, where suppliers are seen as partners and where employees are open to use new products with CE characteristics. This is related to the crucial role played by the sourcing department, which has been highlighted by several interviewees.

CE also requires different engineering practices, according to the interviewees. However, the engineering department already makes use of longer-lasting products, reuse and refurbishing – i.e. strategies for operationalization of CE within the organisation (Preston, 2012). This is at the moment the biggest contribution to CE adoption within Engie, even though these practices have not been publicised as CE. It is unclear if the lack of publicity is the reason why several interviewees still think engineering practices should be changed, or if the reason is that these practices are not extended enough.

The inter-relation between the effects of CE in the organisational culture and vice versa is strong enough that it makes it impossible to further assess SQ1 and SQ2 separately. Therefore, the following SQ discusses several aspects that belong both to the effects of CE adoption in the organisational culture as well as to the effects the organisational culture has in CE adoption.

5.2. Sub-research Question 2

The second SQ was "*How does an organisational culture influence CE adoption?*" According to the research framework, there can be values in the organisational culture that are supportive of CE whereas other values can hinder its adoption.

The most frequent characterisations of the organisational culture refer to it as money-driven, traditional and slow moving, customer-focused, risk-averse and reactive. These can be considered as espoused beliefs and values in Schein's (2004) terminology. Three of these values have been negatively linked to CE adoption by the interviewees, including being money-driven, reactive and traditional and slow moving. For example, being customer-focused led to the application of sustainability values mostly when the customer requires it, instead of taking it up in the general organisational systems.

The findings do not seem to support that the values of closed-loop thinking (Preston, 2012) and environmental awareness (Liu & Bai, 2014) are crucial to CE. The reason might be that closed-loop thinking is a complex concept that to a certain extent is already included in the minds of the interviewees under the sustainability or holistic-thinking concepts. Environmental awareness might be similarly included in existing sustainability values, since the references employees

made to CS mostly had to do with its environment dimension, as it can be observed, for example, in Figure 7.

Literature also suggested that an organisational culture that enables the take up of CE had to be risk-taking (Genovese et al., 2015; Liu & Bai, 2014) and long-term thinking (Genovese et al., 2015). Two interviewees each declared the need to change the organisational culture to promote those values in order to take up CE. CE literature had not described the need that organisational culture should be less money-focused.

The organisational culture of Engie has not been described as particularly sustainable. Current sustainability values do not ensure the inclusion of a minimal level of CS into projects (E, F, C, G). Instead, CS is only considered as per request of the customer (F, G, C). The interviewees have not paid much attention to the need to change this in order to adopt CE. However, a customer-driven organisation that adapts to the each of customer requirements has been deemed unable to achieve a minimum level of CS, as sometimes those requirements do not include CS.

All interviewees presented a positive personal attitude to CS and CE, for example by stating the necessity to undertake CE. It is possible that the opinions the interviewees expressed were more positive than what they felt in reality (van Weelden et al., 2015). This can also be linked to the fact that the statements provided by the interviewees could be perceived foremost at the informational level of the MuSIC memework (Lozano, 2013b), whereby the interviewees are aware of the reasons why CS is important, but do not feel compelled to act nor it is reflected in the emotional level. This will be further debated in SQ4.

As for the underlying assumptions, a few interviewees had stated that, in their opinion, many Engie employees perceive CE and CS as a cost or as something additional to their daily tasks. These perceptions can affect the individual's interpretations of CE as a undesirable concept, as indicated by literature (Fernández et al., 2003), which could therefore hinder CE adoption.

Several values that have been mentioned as affecting to organisational sub-cultures would also affect CE adoption. For example, the engineers have been defined as a group particularly lacking holistic thinking, and to have holistic thinking has been mentioned by most interviewees as a crucial organisational culture change for the adoption of CE. This demonstrates that the differences between organisational groups have to be taken into account, as indicated by Lozano (2013b).

5.3. Sub-research Question 3

To adopt CE, employees need to perceive CE change drivers that encourage its adoption. For that purpose, the third SQ was "*What drives an organisation to adopt CE?*"

Most of the drivers mentioned by Engie employees are internal. Both CS and CE-specific drivers have been mentioned as reasons for Engie to take up CE. However, it should be taken into account that in their statements many interviewees mentioned CE and CS almost interchangeably. This can be a limitation of the research, and seems to support the fact that CE is a tool within CS, as it was

suggested by literature (Genovese et al., 2015; Ghisellini et al., 2015; Greyson, 2007; Murray et al., 2015).

For Engie, the most important CE driver is external, namely 'customer satisfaction' (see Table 5). This makes it especially important to understand the client's drivers in order to ensure said satisfaction. The client's CE drivers (Table 6) are similar to Engie's and as those of the supplier. Only, 'customer satisfaction' is less prevalent for the client. Because the main scope of the research was Engie, it is understandable that fewer drivers have been found for the client's case. It also should be noted that in this case the client has unique characteristics that might affect this analysis. Namely, for this organisation the government is both a separate entity that creates policy and constrains its activity (driver 'national government') as well as its 'client' (driver 'customer satisfaction'). This particularly hampers the validity of these results outside the scope of this particular research.

The CE change drivers' model (Figure 7) has been useful for this analysis. All CE drivers mentioned by the interviewees belonged to one of the categories within the model, including some drivers that overlapped. However, there are some minor adjustments to the CE drivers' model (Figure 7) that can be derived from these findings.

First, 'leadership' is an internal change driver according to Lozano (2013a), but in this case it was also a perceived as an external driver. The reason is that the case study, Engie Infra&Mobility is part of a bigger organisation, and the leadership was both from employees at leadership positions within Engie Infra&Mobility as well as from the headquarters (external to Engie Infra&Mobility). Because this is case specific, it cannot be generalised outside the specific scope of this project, and it does not necessarily imply that changes should be made to the CE drivers' model (Figure 7).

Second, the driver 'corporate and brand reputation' had been given several CE sub-drivers, namely 'brand benefits from differentiation', 'brand benefits from environmental leadership' and 'brand protection'. As the findings show, interviewee statements do not truly enable a differentiation among these three sub-drivers. For example, environmental leadership is often performed in order to achieve brand differentiation, and both ultimately lead to enhance the brand protection. Therefore, these CE sub-drivers have been eliminated from the final version of the CE drivers' model (Figure 9).

Third, the driver of 'alliances and partnerships' refers in this context to the existence of suppliers that push to have their CE products bought and used by Engie (C, F). We suggest that a specific supplier driver should be included in the driver's model as to mirror the existing client's driver 'client satisfaction' and to reflect both sides of the value chain. Therefore, the driver 'supplier innovation' has been added to the CE drivers' model (Figure 9).

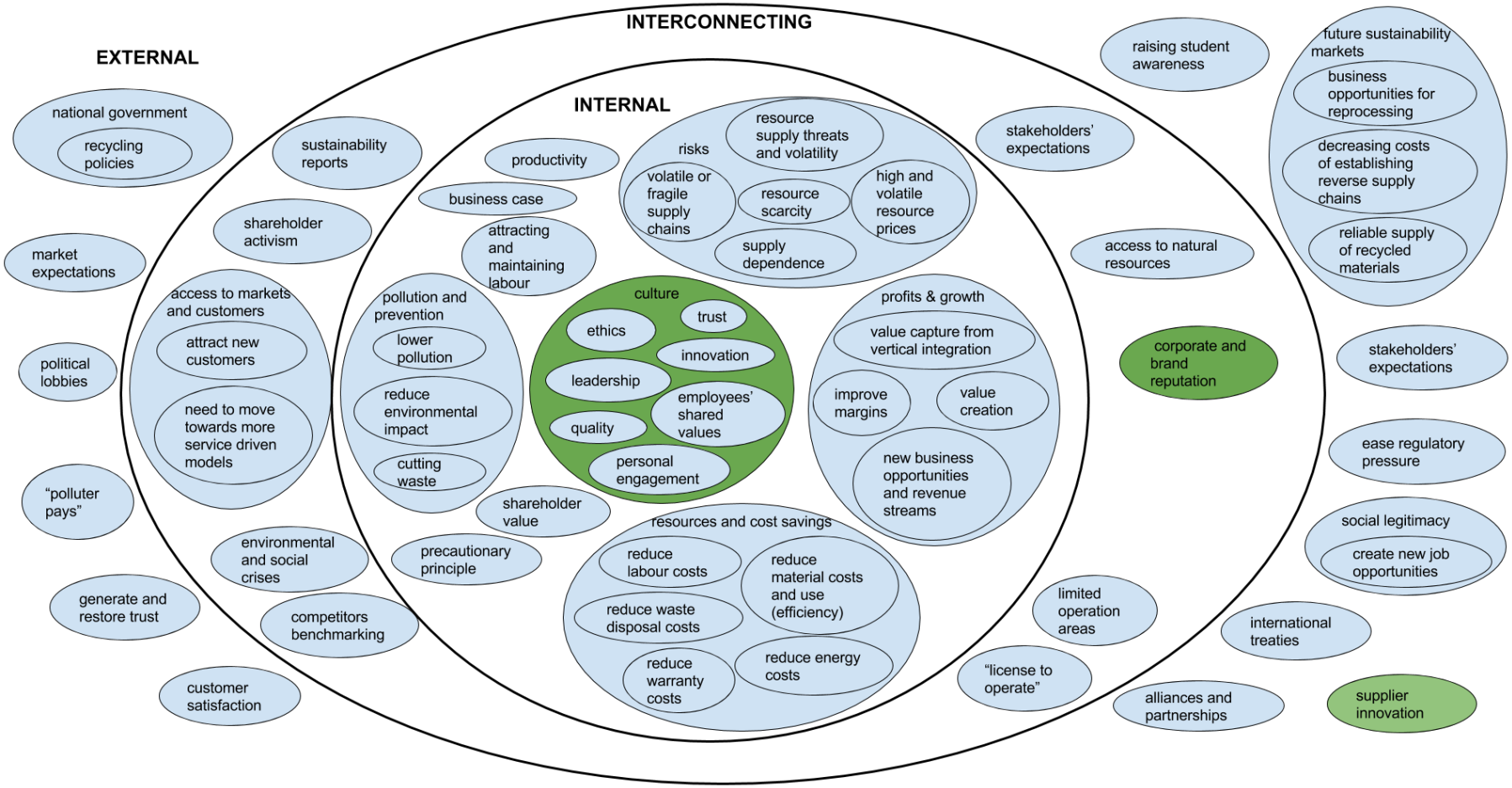

Figure 9. CE driver's model. The findings led to several changes to the previous version of the model. These changes are displayed in green. Adapted from Lozano (2013a).

Most drivers were ultimately linked to an economic benefit, especially by the external interviewees. Namely, the underlying drivers under 'customer satisfaction', 'corporate and brand protection', 'business case', 'competitors benchmarking' or 'resources and cost savings' were all linked to the organisation's wish to obtain future monetary rewards or an economic advantage. Therefore, this means that some CE change drivers might be more relevant than others. This is explored in-depth in the next SQ.

5.4. Sub-research Question 4

The fourth SQ was "*How do CE drivers influence the adoption of CE in an organisation's culture?*" This question is aimed at assessing the relationship between CE drivers and the adoption of CE within the organisational culture.

The fact that the two most important drivers are external and interconnecting, respectively, might prove a difficulty for CE adoption, since according to DeSimone and Popoff (2000), internal drivers are more useful in moving an organisation towards CS.

According to literature, several of the change drivers, like environmental awareness or innovation, can also be considered a value of the organisational culture (Genovese et al., 2015; Liu & Bai, 2014). This was demonstrated by the findings, where sustainability and innovative values within the organisational culture have been described as a driver for CE. Other CE drivers, like personal engagement and employees shared values (Lozano, 2013a) also conform the organisational culture as described by Schein (2004). For this reason, the final CE drivers' model (Figure 9) suggests grouping certain CE drivers under CE-driver culture.

All interviewees expressed that CE is relevant to the future of the organisation. This should facilitate CE adoption (Buchanan et al., 2003; Dawson, 1994; Johnson, 1992). However, some of the interviewees' more indirect statements revealed a lack of perceived urgency. For example, this is exemplified by the fact that CE drivers were expressed as a future customer demand instead of a current customer demand. This would negatively impact the take-up of CE within the organisation and it challenges the relevance of the CE drivers mentioned by interviewees. It is possible that these CE change drivers are not such, but that are instead 'reasons' or 'aspirations' to take up CE (Schein, 2004). These would lack the effectiveness in guiding change that real change drivers have.

At the personal level, interviewees shared a positive attitude and an interest towards CE and CS, mentioning drivers, such as 'ethics', 'environmental awareness' and 'lower pollution' as if their effect was perceived foremost at a personal level.. This might hinder the adoption of CE in a more widespread organisational level. Therefore, it is important to differentiate personal-level motivations from organisation-wide drivers when designing the change plan. The proposed drivers' model could benefit from a new design where, following the same pattern as the MuSIC memework (Figure 2), drivers can differentiate regarding their applicability towards the individuals, the groups or the organisation and the informational, emotional and behavioural level. Further research should also be done to check the CE drivers' model in other contexts, to ensure its validity and generalizability.

The CE change drivers by themselves do not provide a guideline for CE adoption within the organisational culture. Therefore, the next SQ should be addressed to describe the changes necessary to the organisational culture.

5.5. Sub-research Question 5

Since current CE change drivers do not guarantee change for CE adoption, SQ5 "*What have been the differences between current organisational culture and the culture necessary to adopt CE?*" can help in the design of a more effective change process.

The internal interviewees have indicated the organisational culture should change for successful CE adoption. The most important change was the substitution of the money-focused values of the organisational culture with a more holistic thinking, where more aspects of the assets are taken into account (five interviewees). This involves a change to the engineers' mind-set and to not only take money into account when making the purchasing decisions. It was also considered important to change the employees' preconception that CS and CE are expensive (four interviewees) or "something extra" that is outside the employees' usual tasks (three interviewees). Furthermore, the organisation should have a more proactive mind-set, to be able to design CE solutions and projects (three interviewees), and it should foster a long term- and more innovative mind-set (two interviewees each).

The employees' mind-sets and, through them, the organisational culture, can be influenced through artefacts such as objectives and pilot projects. Current CS objectives are not enough to ensure a minimum level of CS. CS policies are often not used or not considered useful. The lack of accountability in CE and CS adoption that interviewees reported might be linked to the lack of CS and CE specific objectives and policies. It is therefore necessary to widen these objectives to include more aspects of CS and CE, where CS and CE adoption can be measured. According to the interviewees, new objectives can help to challenge existing assumptions, and ultimately help to bring about change in the employees' beliefs and organisational culture.

Besides the adoption of new CE objectives, interviewees suggested communication is essential to change the organisational culture. First, it is important to broadcast and make more visible that employees at leadership positions support CE adoption. Second, it is necessary to communicate successful examples, like CE adoption within pilot projects. This can show other employees the way.

Further research is necessary to generalise these findings to other organisational contexts. A detailed description of the values that support CE within the organisational culture would facilitate its adoption. Furthermore, the findings show that research should be dedicated to developing an organisational change strategy, where the detailed roles of every department are taken into account.

Chapter 6. Conclusions

This research has provided insights in the interrelationship between CE and the organisational culture, as well as the role played by the CE change drivers to achieve an organisational culture friendly to CE. To answer the RQ *"What*

organisational culture changes promote the adoption of CE?" a case study within Engie Infra&Mobility was undertaken. The results offer a preliminary insight to the drivers, values, and assumptions that can promote CE.

Sustainability values support CE, while values such as risk aversion, customer-focus, money-focus and reactive attitudes within the organisational culture appear to be a barrier for CE adoption. Money-focus values should be substituted with holistic thinking values. Organisational culture should also have a more proactive, innovative and long-term thinking mind-set. Employees' preconceptions that CS and CE are expensive or "something extra" should be changed. Perceived CE change drivers do not guarantee CE adoption. CE should be promoted internally and not only because of CE drivers such as customer satisfaction.

The changes require clear organisational commitment. The commitment needs to be perceived by employees throughout the organisation, which can be achieved by using communication and CS or CE objectives. The perception that CE is valued by the organisation can ultimately change the organisational culture perceived by employees.

This thesis research provides an innovative CE drivers' model (Figure 9) and an empirically tested list of CE-supportive values that are necessary for CE adoption within the organisational culture. Therefore, it deepens the knowledge of CE adoption within an organisational scope, including research fields where research had been scarce before, namely organisational change and organisational culture. This is particularly relevant because, as it has been stated, organisational culture is crucial for CE adoption.

6.1. Recommendations for the organisation

Since this thesis is based on a single case study, the organisation can induce many recommendations from the discussion and conclusion. These are not repeated within this section.

There are some conclusions that could be considered organisation-specific, which are presented next. Adopting CE within pilot projects does not necessarily guarantee success if it is not ensured that the employees values, such as being risk- or innovation-averse are changed. For this purpose, a clarification of the responsibilities of every department in achieving CE would aid in its adoption. This would indicate how every department is expected to do its part in the take up of CE. For example, to describe that the sourcing department needs to buy certain assets from CE suppliers would more clearly show employees the pathway. Sourcing managers can provide the information on CE products. According to sourcing employees, for this purpose it is important that they are also provided with the decision-making power to enforce the use of these particular suppliers. This decision-making power is granted by the commitment of the leaders within the organisation, which should provide the necessary support and make the support public to other employees through communication.

Salespeople are responsible for bringing up CE early on in the conversation with the customer, when it can still be included in the project's specifications. Engineers should use the information provided by the sourcing department, adopt a more

holistic view on asset design and keep promoting reuse and refurbishment. And most importantly, employees at all leadership positions should publically support CE and communicate how CE aids in achieving organisational objectives in order encourage other employees to take it up.

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Appendix 1

1. Interview with Engie employees

Introduction questions

1. How long have you been employed in Engie?
2. How long have you been employed in your current position?
3. What are your current job responsibilities?

Organisational culture

4. How would you define the corporate mission of Engie?
5. What are the general objectives of the company?
6. How would you define the company's culture? Where culture is the employees' mind-sets, the beliefs and customs, and the employee traits that are valued in the company
7. What kinds of employee traits are valued within Engie? Please give some adjectives of valuable traits
8. How do you address sustainability in practice?
9. Do you like being involved in sustainability initiatives related to your job? YES/NO
    - If NOT, Why not?
10. Do you feel that sustainability is interesting for everybody across the organisation or in practice there are parts of the organisation that seem more interested?
    - Equally regarded
    - Some parts more interested. If so, which groups do you think are most interested? And least interested?

About CE

11. Are you familiar with the term "Circular Economy"? YES/NO
    - If YES, What do you think Circular Economy consists of?
    - If YES, What do you think Circular Economy means for Engie?

After the interviewee provides his/her definition, what he/she said is complemented with all the possible remaining aspects of CE to bring all interviewees to the same ground and to ensure in the following questions they provide comparable answers. This is done through the following definition: **"CE can be understood as optimising material use in the system by reducing, reusing, recycling and recovering materials, including eliminating toxic chemicals and using renewable energy. This can be achieved several ways. For example, developing a circular supply chain, recovering and recycling products, choosing products with a longer lifetime, sharing unused capacities and offering services instead of products".**

12. In your opinion, what aspects of CE affect the company's culture?

13. What do you think are changes to the company culture that are necessary to adopt CE?

CE drivers

14. Do you think CE is relevant for the future of the company? YES/NO
    - If YES, Why do you think CE is relevant for the future of the company?
    - If NOT, Why do you think CE is not relevant for Engie's future?
15. What external aspects do you think are making Engie interested in CE?
16. What internal aspects do you think are making Engie interested in CE?
17. Taking into account these CE drivers, what do you think the role of your job position is in achieving a CE within Engie?
18. How do you think these CE drivers relate to current company culture?
19. Do you have direct contact with Engie's clients? YES/NO And suppliers? YES/NO
    - If YES, With which clients/suppliers do you have direct contact with?
20. Why do you think Engie's clients might be interested in CE?

Artefacts

21. In what ways are the organisation's sustainability concerns reflected in systems, i.e. finance, reporting, incentives and rewards, information, etc.?
22. Do sustainability goals and objectives apply for your job? YES/NO
    - If YES, How do those goals and objectives help to improve the sustainability of the company or the projects?
23. Do guidelines or policies in sustainability apply to your job responsibilities? YES/NO
    - If YES, How do those guidelines help to improve the sustainability of the company or the projects?
    - If NOT, How do you know how to apply sustainability in the context of your job?
24. Do you think the company's general policies truly represent the culture of your company? YES/NO
25. Do you think these policies are adequate to confront the future threats and opportunities your company is facing? YES/NO
    - If NOT, What would the policies need to change to adjust to those threats and opportunities?
26. Are Sustainability Key Performance Indicators used within your job responsibilities? YES/NO
    - If YES, How do those Key Performance Indicators help to improve the sustainability of the company or of the projects?
    - If NOT, Do you think Key Performance Indicators are necessary to improve the sustainability of the company's activities? YES/NO
27. Are sustainability objectives linked to specific incentives, like compensation schemes? YES/NO

- If YES, 1. Which ones are they?
- If YES, 2. Do they motivate you? YES/NO

28. Which policies, goals or Key Performance Indicators are barriers to achieve a more CE?

Additional requirements for CE adoption

29. What else do you think is needed to facilitate the adoption of CE?

2. Interview with external stakeholders

Introduction questions

30. How long have you been employed in your company?
31. How long have you been employed in your current position?
32. What are your current job responsibilities?
33. For how long have you personally been in contact with Engie?
34. With which of Engie's employees or departments do you usually have contact with?

About company culture and CS:

35. What aspects of sustainability and CE have you already discussed with Engie?
36. In what way do you think Engie's sustainability concerns are reflected in its behaviour?
37. How would you define Engie's corporate culture? E.g. Engie's employees mind-sets
38. How does the company culture of Engie compare to other companies that you deal with?
39. In your opinion, are Engie employees interested in sustainability? YES/NO
40. Do you feel sustainability is equally regarded across Engie or in practice there are parts of the organisation that seem more interested than others? If so, which groups do you think are most interested? And least interested?

About CE:

41. Why do you think CE is relevant for the future of your organisation? What are the drivers making you interested in CE?
42. Do you think these change drivers also affect Engie? YES/NO
43. What drivers do you think make Engie interested in the CE?
44. In which way do you think is Engie reacting to these drivers?
45. Are there any other reasons you think a company in Engie's sector should be interested in the Circular Economy?
46. What do you think is Engie's role in helping achieve a more CE?
47. In your experience, did people's mind-sets have to change within your organisation to adopt CE propositions? YES/NO If YES, How?
48. In your opinion, how would current company culture at Engie affect the adoption of CE propositions?

49. Do you think there are necessary changes to Engie's company culture for them to adopt CE? If YES, which changes do you think are necessary?
50. Have you encountered any barriers or problems when discussing CE or sustainability with Engie?
51. What advice would you give Engie if they want to promote the CE in their projects?
52. Is there anything else you think is needed to facilitate the adoption of the CE? If so, what do you think is needed?

Appendix 2

1. Drivers Engie
    a. External
        i. National government
            1. Recycling policies
        ii. Market expectations
        iii. Political lobbies
        iv. "Polluter pays"
        v. Generate and restore trust
        vi. Customer satisfaction
        vii. Raising student awareness
        viii. Future sustainability markets
            1. Business opportunities for reprocessing
            2. Decreasing costs of establishing reverse supply chains
            3. Reliable supply of recycled materials
        ix. Stakeholders' expectations
        x. Ease regulatory pressure
        xi. International treaties
        xii. Social legitimacy
        xiii. Alliances and partnerships
    b. Interconnecting
        i. Sustainability reports
        ii. Shareholder activism
        iii. Access to markets and customers
            1. Attract new customers
            2. Need to move towards more service-driven models
        iv. Environmental and social crises
        v. Limited operation areas
        vi. Stakeholders' expectations
        vii. Access to natural resources
        viii. Corporate and brand reputation
            1. Brand benefits from differentiation
            2. Brand benefits from environmental leadership
            3. Brand protection
        ix. Competitors' benchmarking
        x. "License to operate"
    c. Internal
        i. Productivity
        ii. Business case
        iii. Leadership
        iv. Employees shared values
        v. Attracting and maintaining labour
        vi. Personal engagement
        vii. Trust
        viii. Ethics
        ix. Innovation
        x. Precautionary principle
        xi. Culture
        xii. Shareholder value

xiii. Quality
xiv. Profits and growth
    1. Value capture from vertical integration
    2. Improve margins
    3. Value creation
    4. New business opportunities and revenue streams
xv. Risks
    1. Resource supply threats and volatility
    2. Volatile or fragile supply chains
    3. Resource scarcity
    4. Supply dependence
xvi. Pollution and prevention
    1. Lower pollution
    2. Reduce environmental impact
    3. Cutting waste
xvii. Resources and cost savings
    1. Reduce labour costs
    2. Reduce waste disposal costs
    3. Reduce material costs and use (efficiency)
    4. Reduce warranty costs
    5. Reduce energy costs

2. Perceived drivers Client
    a. External
        i. National government
            1. Recycling policies
        ii. Market expectations
        iii. Political lobbies
        iv. "Polluter pays"
        v. Generate and restore trust
        vi. Customer satisfaction
        vii. Raising student awareness
        viii. Future sustainability markets
            1. Business opportunities for reprocessing
            2. Decreasing costs of establishing reverse supply chains
            3. Reliable supply of recycled materials
        ix. Stakeholders' expectations
        x. Ease regulatory pressure
        xi. International treaties
        xii. Social legitimacy
        xiii. Alliances and partnerships
    b. Interconnecting
        i. Sustainability reports
        ii. Shareholder activism
        iii. Access to markets and customers
        iv. Environmental and social crises
        v. Limited operation areas
        vi. Stakeholders' expectations
        vii. Access to natural resources
        viii. Corporate and brand reputation

ix. Competitors' benchmarking
x. "License to operate"

c. Internal
i. Productivity
ii. Business case
iii. Leadership
iv. Employees shared values
v. Attracting and maintaining labour
vi. Personal engagement
vii. Trust
viii. Ethics
ix. Innovation
x. Precautionary principle
xi. Culture
xii. Shareholder value
xiii. Quality
xiv. Profits and growth
1. Value capture from vertical integration
2. Improve margins
3. Value creation
4. New business opportunities and revenue streams
xv. Risks
1. Resource supply threats and volatility
2. Volatile or fragile supply chains
3. Resource scarcity
4. Supply dependence
xvi. Pollution and prevention
1. Lower pollution
2. Reduce environmental impact
3. Cutting waste
xvii. Resources and cost savings
1. Reduce labour costs
2. Reduce waste disposal costs
3. Reduce material costs and use (efficiency)
4. Reduce warranty costs
5. Reduce energy costs

3. Culture
a. Espoused beliefs & values
i. Mission
ii. Sustainability values
iii. Environmental awareness
iv. Innovation values
v. Risk-taking values
vi. Closed-loop thinking
vii. Long-term thinking
viii. Holistic/systems thinking
ix. High-quality design values
x. Other values that conform current culture
1. Mentioned as positive for CE

        2. Mentioned as negative for CE
    b. Underlying assumptions
        i. Beliefs and views
        ii. Thoughts and emotions
        iii. Perceptions
    c. Artefacts
        i. Objectives
        ii. Business model
        iii. Certificates
        iv. Technology
        v. Incentives
        vi. Policies and documentation
        vii. Myths and stories
    d. Necessary changes to support CE
        i. Espoused beliefs and values
        ii. Underlying assumptions
        iii. Artefacts
    e. Difference between departments (groups)
    f. Difference between informational, emotional, behavioural levels
    g. Difference between individual, groups and organisational levels
4. Circular Economy
    a. General definition
    b. Role of Engie
    c. Barriers
    d. Requirements