MANAGING ORGANIZATIONAL ENVIRONMENTAL CHANGE: CONSTRUCTING AN ACTION PLAN FOR SUCCESSFUL IMPLEMENTATION OF ISO 14001 EMS IN YIT INFRASTRUCTURE PROJECTS

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Author: Marikki Makkonen
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Supervisor: Tiina Onkila

JYVÄSKYLÄN YLIOPISTO
UNIVERSITY OF JYVÄSKYLÄ

ABSTRACT

Author	
Marikki Makkonen	
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Abstract	

Abstract

There are brilliant theories, models and systems that have been developed to tackle challenges related to the environmental pillar of sustainability. In the corporate context, these include for example environmental management systems (EMSs). However, the worth of these systems only truly becomes apparent on the practical level. Recently, the focus of the literature regarding corporate responsibility has shifted from the mere examination of sustainability-related concepts, models and systems towards how they should be implemented in organizations.

The implementation of corporate social responsibility (CSR) and corporate environmental responsibility (CER) in organizations can be understood as organizational change processes. In this study, the implementation of CER, more specifically, the ISO 14001 EMS in YIT Infrastructure projects, has thus been called organizational environmental change and examined from the perspective of change management. The work has been conducted as a qualitative, intensive case study. The data has been gathered in interviews and meetings as well as through observation. The purpose of this study was to find out the key strengths and challenges related to the implementation of the ISO 14001 EMS in YIT Infrastructure projects. Based on these findings, an action plan was formulated to support the implementation of the EMS in the case organization.

As a whole, the findings from this study seem to go hand in hand with the existing literature regarding the implementation of ISO standards, EMSs and CER in general in the context of construction industry. That is, the key findings of this study specifically highlight the lack of environmental awareness, the importance and lack of CER leadership and culture as well as the challenge in balancing the sustainability triple bottom line (TBL) and the stakeholder interests. YIT Infrastructure projects' strengths regarding the implementation of the EMS and CER in general were the integration of CER in the organization's strategy, strong focus on systems development as well as the sense of urgency for change.

Key words

Change management, corporate environmental responsibility (CER), ISO 14001 environmental management system (EMS), infrastructure construction, Kotter's model, PDCA, MINDSPACE framework, lean management

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Tiivistelmä

Kestävän kehityksen ympäristöulottuvuuteen liittyvien haasteiden hallintaan on kehitelty erilaisia teorioita, malleja ja järjestelmiä. Yritysmaailman kontekstissa esimerkkejä tällaisista edustavat esimerkiksi ympäristöjohtamisjärjestelmät. Näiden järjestelmien hyödyt toteutuvat kuitenkin vasta niiden jalkauduttua käytäntöön. Viime aikoina yritysvastuullisuutta käsittelevä tutkimus on kestävään kehitykseen liittyvien käsitteiden, mallien sekä järjestelmien tutkimisen ja määrittelyn sijaan keskittynyt entistä enemmän niiden käytännön soveltamiseen organisaatioissa. Yritysten yhteiskunta- ja ympäristövastuiden jalkautus ja soveltaminen organisaatioissa voidaan ymmärtää muutosprosesseina. Tässä tutkimuksessa ympäristövastuun, tarkemmin sanottuna ISO 14001-ympäristöjohtamisjärjestelmän soveltamista organisaatiossa kutsutaan näin ollen organisaation ympäristömyönteiseksi muutokseksi ja sitä tarkastellaan muutosjohtamisen kautta.

Työ on suoritettu laadullisena, intensiivisenä tapaustutkimuksena. Aineisto siihen on kerätty haastatteluin, havainnoinnin kautta sekä haastattelun kaltaisissa tapaamisissa. Tutkimuksen tarkoituksena oli selvittää pääasialliset vahvuudet ja haasteet liittyen ISO 14001-ympäristöjohtamisjärjestelmän soveltamiseen YIT Infraprojektit-organisaatiossa. Näiden tulosten avulla on koottu toimintasuunnitelma, jonka tarkoituksena on tukea ympäristöjohtamisjärjestelmän soveltamista organisaatiossa. Kaiken kaikkiaan tutkimuksen tulokset vaikuttavat olevan saman suuntaisia kuin aiempien, ISO-standardien, ympäristöjohtamisjärjestelmien ja yritysten ympäristövastuun soveltamista tutkivien, rakentamisalaan sijoittuvien tutkimusten tulokset. Tämän tutkimuksen tulokset viittaavat erityisesti ympäristötietoisuuden puutteeseen, ympäristövastuuta tukevan johtajuuden tärkeyteen ja puutteisiin sekä haasteisiin tasapainottaa kestävän kehityksen eri ulottuvuuksia ja sidosryhmien intressejä. Ympäristövastuun sekä ympäristöjohtamisjärjestelmän soveltamisessa YIT Infraprojekteissa erityisiksi vahvuuksiksi osoittautuivat ympäristövastuun sisältyminen strategiaan, vahva järjestelmäkehitys sekä organisaatiossa vallitseva käsitys muutoksen tarpeellisuudesta.

Asiasanat

Muutosjohtaminen, yritysten ympäristövastuu, ISO 14001-ympäristöjohtamisjärjestelmä, infrarakentaminen, Kotterin malli, PDCA-malli, MINDSPACE-malli, lean-johtaminen

Säilytyspaikka

Jyväskylän yliopiston kirjasto

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1   INTRODUCTION

1.1   Background of the research

We are living in times of remarkable climatic, environmental and societal changes. To be able to fulfill the needs of the following generations, all societal and industrial sectors must be reactive to changes but also proactively contribute to sustainability, which today is often defined combining Brundtland Commission's (1987, as cited by Carroll, 2015, p. 92) definition of sustainable development: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs" and the triple bottom line (TBL) framework, according to which sustainability consists of three dimensions: environmental, social and economic (Carroll, 2015).

There are brilliant theories, models and systems that have been developed to tackle challenges related to the environmental pillar of sustainability. In the corporate context, these include for example environmental management systems (EMSs) as well as other new governance approaches, such as sustainability rating systems. However, the worth of these systems only truly becomes apparent on the practical level. Recently, the focus of the literature regarding corporate responsibility has, indeed, shifted from the mere examination of sustainability-related concepts, such as corporate social responsibility (CSR) and the motives behind the adoption of sustainability models and systems towards how they should be implemented in organizations (Kudlak & Low, 2015). However, there is evidence that the practical implementation of CSR (Asif et al., 2013, as cited by Souza & Alves, 2017) and different kinds of management standards (Boiral, 2011) still requires further scrutiny. Furthermore, according to Halme, Rintamäki, Knudsen, Lankoski and Kuisma (2018) the fact that CSR performance improvements do not automatically follow CSR management must be acknowledged when defining and discussing CSR.

When it comes to construction industry, there are still challenges in implementing corporate environmental responsibility (CER) in practice (e.g. Martek, Hosseini, Shrestha, Edwards & Durdyev, 2019 and Isaksson & Linderoth, 2018). These include a lack of awareness and leadership (Martek et al., 2019) as well as the difficulty of balancing the pillars of TBL (Martek et al., 2019 and Isaksson & Linderoth, 2018) while considering the stakeholders', notably the client's, interests (Isaksson & Linderoth, 2018). On the other hand, external pressures also typically drive CER-related measures and decisions, such as the implementation of an EMS (Chiarini, 2019). Furthermore, there are a number of possible pitfalls related to the implementation of ISO standards in organizations in general, i.e. not only in the construction industry (Boiral, 2011). All these challenges should be addressed when implementing an EMS or developing an organization's CER. Because the challenges related to the implementation of EMSs and the development

of an organization's CER overall seem to go somewhat hand in hand and because the ISO 14001 EMS is particularly dedicated for managing and steering CER, the implementation process of the EMS and the overall CER development will be discussed closely together in this study.

The implementation of CSR and CER in organizations can be understood as organizational change processes (George & Jones, 1996, as cited by Maon, Lindgreen & Swaen, 2009). Furthermore, previous research has suggested that change management could be a useful tool in leading and steering companies' sustainability efforts (Huong, 2014) as well as in implementing EMSs (Ronnenberg, Graham, & Mahmoodi, 2011). In this study, the implementation of CER in the organization will thus be called organizational environmental change and examined as a change management process.

The change management approach in this study mixes widely accepted and used models that can already be understood as rather classic, such as Kotter's (1996) 8-step change model and the plan-do-check-act (PDCA) model by Deming (Deming, 2000 and Choo, Linderman & Schroeder, 2007, as cited by Matsuo & Nakahara, 2013) with newer management models and ideologies more specifically focused on certain factors affecting change, such as the MINDSPACE framework by Dolan, Hallsworth, Halpern, King, Metcalfe and Vlaev (2012) and the lean management philosophy based on Taichi Ohno's work (Ohno, 1988, as cited by Hallam & Contreras, 2016). Along with the change management models, the theoretical part of this study discusses CER steering and management instruments, especially EMSs and sustainability rating tools as well as the process of implementing an EMS in an organization. The purpose of discussing a wide range of different, classic and more recent theories with different focuses was to formulate as comprehensive as possible a basis for the interpretation and understanding of the results of the study.

During the summer of 2019, I got the honour of planning and composing a practical ISO 14001 manual for the YIT Infrastructure projects segment, which got me close to the organization's environmental responsibility and sustainability efforts on a practical level and gave me the possibility to hear the experiences and opinions of managers, employees and sustainability professionals representing a wide range of different roles. Moreover, this experience allowed me to learn how environmental responsibility is practiced within the construction industry. After completing the manual project, I got the responsibility of contributing to its deployment through planning and conducting an environmental training in cooperation with the environmental manager of YIT Infrastructure projects.

These experiences truly inspired me to continue studying the implementation process of the ISO 14001 standard and the organization's environmental responsibility more thoroughly. I understood that to concretize the benefits of the EMS, its implementation process should be examined from a wider perspective, including all the different phases: decision to adopt, strategic planning, system design, deployment (Ivanova, Gray & Sinha, 2014) and follow-up (Boiral, 2011). When beginning my Master's Thesis project, the timing for a research concerning

the implementation of the ISO 14001 EMS in YIT Infrastructure projects seemed great since the organization had recently, in 2018, gone through a merger with Lemminkäinen Corporation (YIT Corporation, n.d.b) and was now in a stage where planning of new policies, structures, systems and practices as well as reviewing of the old ones, was taking place.

1.2 Purpose and objectives of the research

To determine how the ISO 14001 EMS is currently implemented in YIT Infrastructure projects and to identify the challenges and strengths related to this process, research was needed. Based on my preunderstanding of the situation, which I had constructed while working in the organization for a couple of months, I had an idea of some challenges that might appear in the implementation of the EMS. These included e.g. communication about the EMS, problems in the general information flow within the organization, the collection and harmonization of knowledge in the organization, stabilizing the change as well as engaging partners and other stakeholders in the implementation process. Through this study, I aimed to construct a more thorough understanding of the current situation regarding the implementation of the EMS and the development of CER in the organization. Based on this understanding, I formulated conclusions that could support the organization in choosing the next steps of this ISO 14001-related CER development. The research questions were the following:

1. What are the key strengths and challenges regarding the implementation of the ISO 14001 EMS in YIT Infrastructure projects?

2. What actions should be taken to improve the implementation of the ISO 14001 EMS and the development of CER in YIT Infrastructure projects?

1.3 Research structure and execution

This study concerns the whole YIT Infrastructure projects segment, including all its divisions and countries of operation. The work has been conducted as a qualitative, intensive case study. This approach was particularly suitable for this study, since to answer the research questions, a thorough understanding of the studied system and its context was required. Furthermore, the fact that I had worked in the organization for a couple of months before the beginning of the study and continued working there during the study, as well, provided an excellent possibility for me to understand the case from the inside, which is one aim of an intensive case study (Eriksson & Kovalainen, 2008). The choice of a qualitative approach was very much based on the same reasons, since through working

in the organization I got to experience the individuals' interactions and behaviours in natural settings, which is central to qualitative research (Lichtman, 2014).

The data used in this study was gathered in different kinds of interviews and meeting as well as through observation. Interviews support the insider perspective and the generation of a rich dataset that is required for an intensive case study (Hair, Wolfinbarger, Money, Samouel & Page 2015). The unplanned meetings, on the other hand, are typical when experiencing the studied system in real-life settings (Lichtman, 2014). The observation data further complements, contests and on the other hand, verifies the interview data (Eriksson & Kovalainen, 2008 and Stake, 2010). Observation also played an important role as an empirical basis toward which I was able to critically reflect the findings from this study.

The data analysis was conducted through qualitative, conventional content analysis, i.e. analysis where the concepts, categories and new insights emerge from the data, not from predetermined, theory-based frameworks (Kondracki & Wellman, 2002 as cited by Hsieh & Shannon, 2005). This from of analysis was chosen for two reasons: First, it is a typical form of analysis in cases where there is little existing literature of the phenomenon (Hsieh & Shannon, 2005). Second, the case-centric focus of the study contributed to the choice of this analysis method.

1.4   Introduction of the case organization

YIT's roots extend as far back as in the beginning of the 20th century, in the Helsinki branch office of a Swedish company called Ab Allmänna Ingeniörsbyrån (YIT Corporation, n.d.a). In 2018, YIT merged with Lemminkäinen Corporation with the aim of increasing strength, balance, growth and profitability (YIT Corporation, n.d.b). Today, YIT is the largest construction company in Finland and an important player in the North European construction industry, overall (YIT Corporation, n.d.c). The company specializes at building apartments, business premises and infrastructure, and aims at contributing to the development and construction of sustainable living services and environments. YIT's business activities range from small to complex, extensive projects and cover different kinds of construction operations and services, such as renovation (YIT Corporation, n.d.d). YIT has five reportable business segments: Housing Finland and CEE, Housing Russia, Business premises, Infrastructure projects as well as Partnership properties (YIT Corporation, n.d.e). FIGURE 1 (YIT Corporation, n.d.c., p. 3) shows in which countries the different business segments operate as well as the extent of YIT's operations in each country in the form of employment and revenue.

The case organization in this study is the Infrastructure projects business segment of YIT Group. YIT Infrastructure projects covers a wide range of construction projects, including the building of roads, bridges, railway and metro stations, ports, parking facilities as well as energy, water supply and industrial

plants, the quarrying of tunnels and mines, the reinforcement of the soil and the contribution to the development of renewable energy forms (YIT Corporation, n.d.f). YIT Group's revenue in 2019 was 3,391.5 million euros of which the Infrastructure projects accounted for 806.7 million euros (YIT Corporation, n.d.g). Of the Group total of 7,417 employees, 2,017 were working in Infrastructure projects in 2019. YIT Infrastructure projects segment operates in Finland, Sweden, Norway, Estonia, Latvia and Lithuania (YIT Corporation, n.d.f).
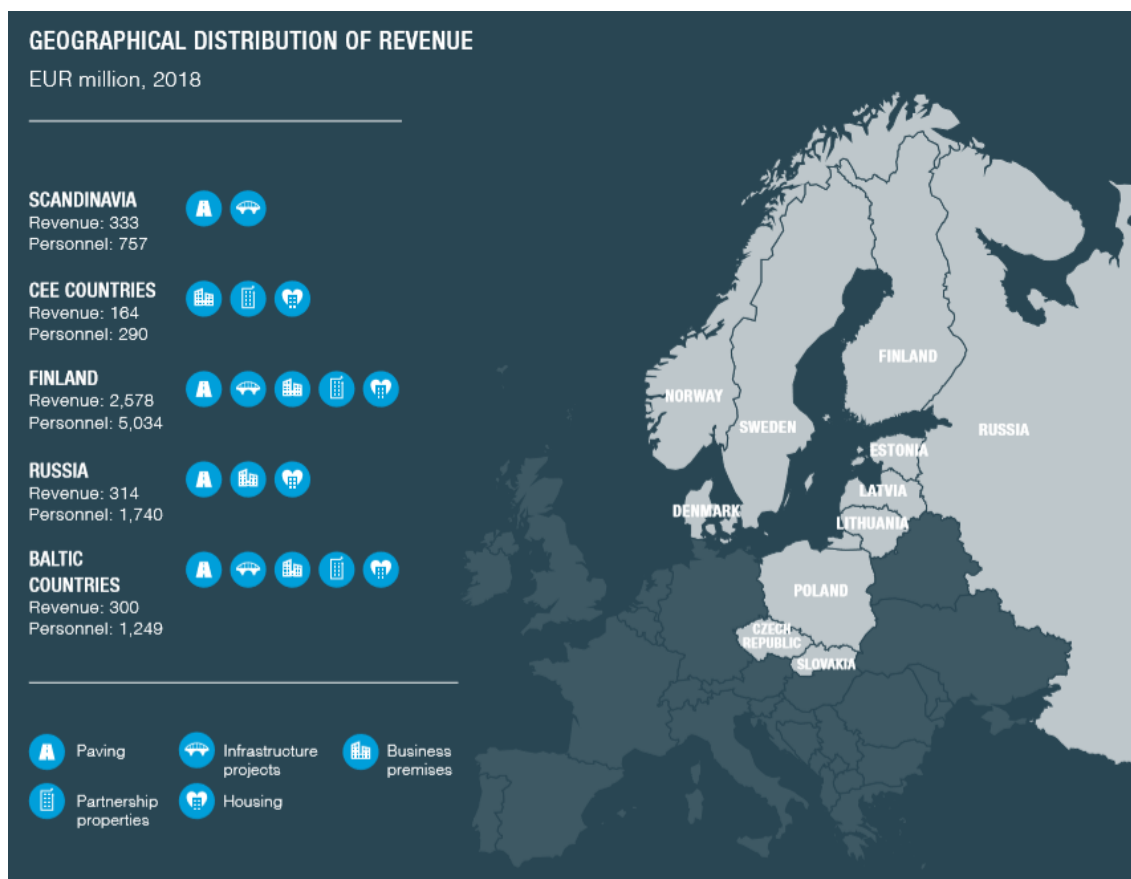
FIGURE 1 Countries in which the YIT business segments operate and the extent of YIT's operations in each country in the form of employment and revenue (YIT Corporation, n.d.c, p. 3)

2 ENVIRONMENTAL ASPECTS AND IMPACTS OF INFRASTRUCTURE CONSTRUCTION

2.1 Environmental impacts of infrastructure construction

Infrastructure encompasses fairways such as streets, roads, railways, tunnels and bridges as well as other structures such as ports, airports, parks and underground systems carrying water, heat, electricity and information (Infra Contractors Association in Finland, n.d). Infrastructure construction is an important player in developing functions that contribute to many sustainability improvements in the society, such as land use, sustainable traffic solutions, pollution prevention and limiting solutions, renewable energy solutions, energy and resource efficiency as well as access to shelter, clean water and means for communication (New Climate Economy, 2016, as cited by Griffiths, Boyle & Henning, 2018).

Despite the necessity of infrastructure to the society, the construction and maintenance of it also contribute to a number of adverse impacts to the air, climate, water systems, soil, ecosystems, cultural and built environment as well as human well-being (FIGURE 2). Two particularly considerable environmental impacts related to infrastructure construction are the modification of ecosystems and environments through changing land use (Millennium Ecosystem Assessment, 2005 and Sala et al., 2000, as cited by Tardieu, Roussel, Thompson, Labarraque & Salles, 2015) as well as material-related impacts, such as natural resource depletion and waste creation (e.g. Zutshi & Creed, 2015).

In infrastructure projects, it is usual that soil and contaminated soil must be excavated and moved around (YIT Corporation, n.d.h). Furthermore, infrastructure construction uses great amounts of rock and soil as raw materials, especially in the northern countries where the groundwork for roads, railways and buildings must be done particularly carefully due to ground frost (Jantunen, 2012). The use of virgin materials contributes to natural resource depletion and the transportation of materials to emissions caused by the traffic. In Finland and other countries where transportation distances are long, the emissions from the transportation of materials and masses contribute to a particularly considerable environmental impact (Jantunen, 2012). The use of raw materials accounts for an increasing share of the climate impact of infrastructure construction (The Finnish Transport Infrastructure Agency, 2018).
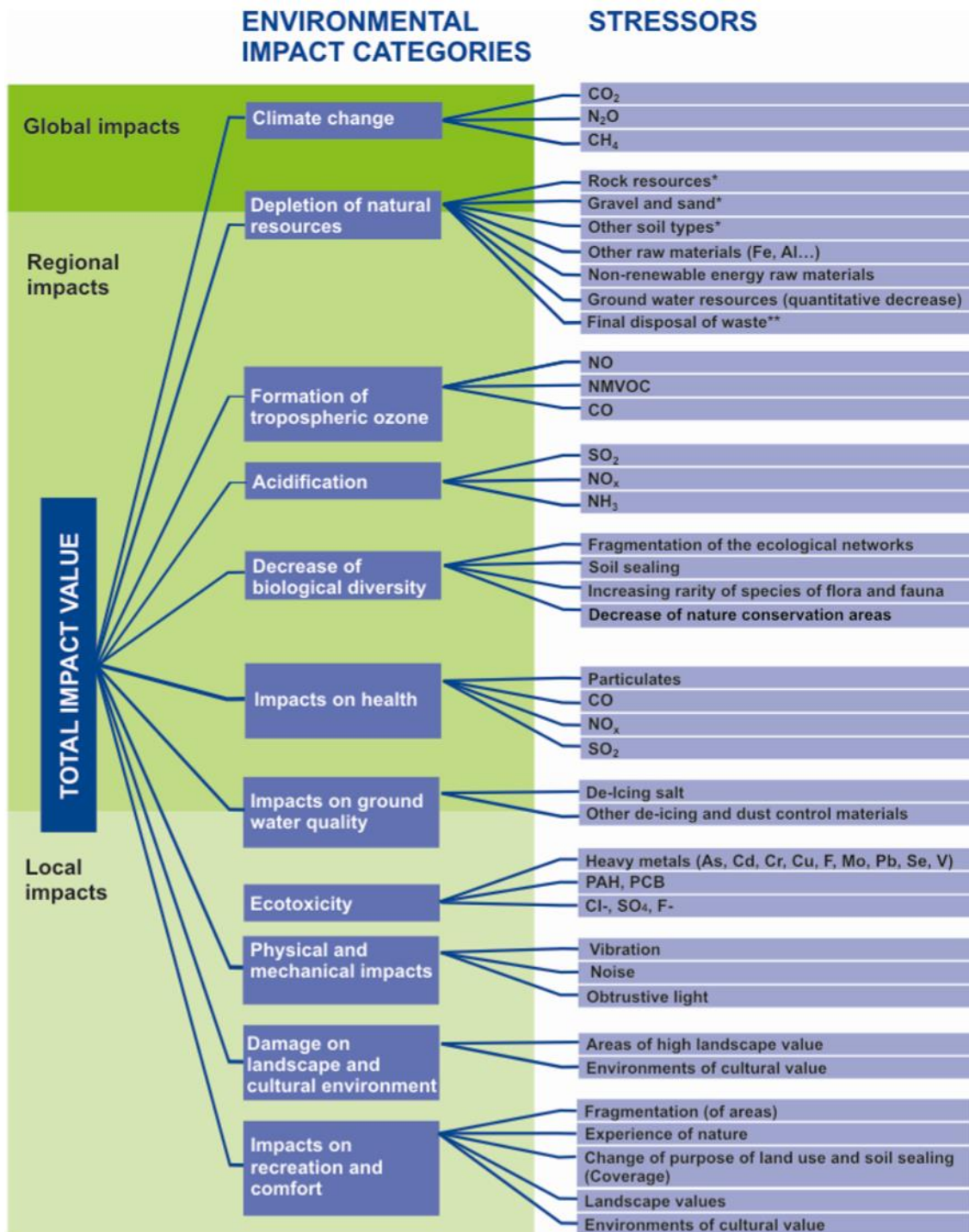
FIGURE 2 Environmental impacts of infrastructure construction (Korkiala-Tanttu, Tenhunen, Eskola, Häkkinen, Hiltunen & Tuominen, 2006, p. V).

2.2 Environmental and climate-related pressures the construction industry is facing

Both the EU and the Finnish Government have set ambitious environmental and climate targets. The most relevant Finnish and EU targets regarding the construction industry are presented in TABLE 1. The practical implication of these targets to the construction industry is that more attention must be paid to the selection and circulation of materials as well as to the life-cycle impacts of construction and that fossil-based energy must be gradually replaced with renewable options.

TABLE 1 Climate and energy targets for the EU and Finland (*European Commission, n.d.; **Ministry of the Environment, 2018; ***Climate Change Act (609/2015); ****Finnish Government, 2019; ***** European Union, The European Parliament and the council of the European Union, 2009; ****** Ministry of Economic Affairs and Employment, 2017 and ******* Ministry of Economic Affairs and Employment, 2014).

	EU			Finland				
	2020	2030	2050	2020	2029	2030	2035	2050
Reduction of GHG emissions (compared to 1990) (%)	20*	≥ 40*	80-95*	20**		40**		80***
Carbon neutrality							x****	
CO_2 reduction IN building sector (compared to 2005)		30**						
Energy from renewables (from total energy consumption) (%)	20*	≥ 32*		38*** **		50*** ***		
Energy from renewables for traffic	10**			20*** ****				
Increase in energy efficiency (%)	20*	≥ 32.5*		20**		≥ 32.5 **		
Energy self-sufficiency (%)						55*** ***		
Coal use prohibition in energy production					x****			

In addition to the EU regulation, the Baltic countries as well as Sweden and Norway follow their own environmental and climate-related legislation and targets

(European Construction Sector Observatory 2019a, European Construction Sector Observatory 2019b, European Construction Sector Observatory 2019c, European Construction Sector Observatory 2019d and Mission of Norway to the European Union, n.d.) Their construction-related environmental impacts, such as waste generation and emissions, their strengths and their success in mitigating their environmental impacts, vary.

In addition to the regulatory pressures concerning the whole construction industry, specific environmental and climate-related pressures are posed to infrastructure construction (Vainio & Nippala, 2014) (TABLE 2). The Finnish Transport Infrastructure Agency (2018) further emphasize the pressures for the infrastructure construction industry to reduce its GHG emissions. According to them, one of the most effective ways to reduce GHG emissions is the assessment of alternative materials, methods, logistics, etc. throughout the whole construction project, especially in its early phases.

Besides regulatory, environmental and climate-related pressures, the construction industry currently faces considerable stakeholder demands and scrutiny regarding environmental management (e.g. Chiarini, 2018 and Zutshi & Creed, 2015). Vainio and Nippala (2014) present societal pressures towards the construction industry, stating that the rapid flow of information in the era of internet and social media may be a possible contributor to better networking but at the same time, a challenge to maintaining a good reputation. Furthermore, according to Vainio and Nippala (2014), social legitimacy has become an important condition for construction projects, which is why stakeholder engagement throughout the project has been enhanced.

TABLE 2 Environmental and climate-related challenges and pressures expected to affect and modify infrastructure construction currently and in the future (Vainio & Nippala, 2014, p. 12)

Level	Challenges and pressures
Global	• Extreme weather conditions are expected to occur more frequently • Low-carbon economy has been set as a target of national economies • Scarcity of soil supplies in the world's centres of growth • Expected scarcity of household water due to e.g. irrigation
National	• Zoning, construction and land-use aim to contribute to eco-efficient communities • Dispersed energy production • The use of renewal energy is expected to increase • The groundwater protection is expected to be emphasized • Environmental regulation is expected to extend and get stricter
Infrastructure construction	• The transportation distances of soil masses and materials are expected to get longer • The circulation of materials from old structures and overall, the use of circulated materials is expected to increase

Project	- The territories and occurrence of endangered species is expected to be done during the early phases of construction - Contaminated soil is identified and processed - Surplus materials are expected to be circulated efficiently between different projects - The processing of runoffs is expected to change

3 MANAGING AND SUSTAINING CHANGE IN OR-GANIZATIONS

3.1 Change management (CM)

Change management (CM) has been described as a continuous, challenging and unavoidable process (Huong, 2014) including a set of tools (Creasy, 2018, as cited by Galli, 2018) for planning, coordinating, organizing and controlling the change and development of an organization's performance as well as the achievement of its strategic objectives (Huong, 2014) and other desired results (Creasy, 2018, as cited by Galli, 2018). According to Huong (2014), CM can be regarded as una-voidable since change itself is unavoidable in the current dynamic, evolving en-vironments and contexts. Huong (2014) states that organizational CM is crucial because a failure to adopt the inevitable changes posed by the internal and exter-nal contexts may lead to the escalation of existing problems, impacts to the soci-ety or the environment or a threat to the organization's survival. Appelbaum, Habashy, Malo and Shafiq (2012) consider the successful implementation of changes a pivotal contributor to an organization's short and long-term success.

Successful CM requires knowledge of the nature, causes, types and possible outcomes of change (Huong, 2014). Because organizational changes are closely related to the changes in the internal and external environments of the organiza-tion, it is important to learn to know them well. The internal environment con-sists of tangible resources, i.e. physical and financial resources as well as intangi-ble resources, such as human capital, trust, skills, reputation, knowledge, etc. (Huong, 2014). The external environment includes the general environment con-sisting of political, economic, sociocultural, technical, legal and environmental (PESTLE) factors and the specific environment consisting of suppliers, customers, competitors and pressure groups (Huong, 2014).

Besides knowing the environments and contexts, the organization going through a change must know and manage all the layers of CM, which according to Galli (2018) are organizations, people and projects. Beer and Nohria (2002, as cited by Lies, 2012) agree with this view, saying that CM is increasingly under-stood as a holistic process, meaning that both hard and soft factors and ap-proaches should be considered in it. Hard factors are controllable and include e.g. costs and life-cycle times (Lies, 2012). Talmaciu (2014) talks about a systematic, hard system change model, characterized by rationality, logic and a limited con-sideration of human-related factors. Soft factors, on the other hand, are not as controllable as hard factors (Lies, 2012) and the soft system approach concen-trates more on the human-related factors of a change process, such as leadership, organizational culture and motivation (Talmaciu, 2014).

3.2 Corporate environmental responsibility (CER) and organizational environmental change

Today, businesses' role in the society is commonly expected to be not only socially, ethically and legally compliant and responsible (Lindgreen & Swaen, 2004 and Luo & Bhattacharya, 2006, both as cited by Maon et al., 2009) but also active in contributing to a better future (Friedman & Miles, 2002, as cited by Maon et al., 2009). In fact, corporations increasingly take part in creating and designing the social order and are therefore seen as drivers of change in today's society (Kudlak & Low, 2015).

3.2.1 Corporate social responsibility (CSR) and corporate environmental responsibility (CER)

There are plenty of overlapping, competing and complementary concepts that describe businesses' role in and responsibilities toward the society (Carroll, 2015). These include for example business ethics (BE), stakeholder management (SM), corporate citizenship (CC), and sustainability (SUS). However, according to Carroll (2015), corporate social responsibility (CSR) can be seen as an umbrella term incorporating the other terms. CSR itself is a rather contested concept having multiple different definitions (Dahlsrud, 2008 and Carroll, 2015), so here I will explain the concept by first going through the related concepts listed above.

According to Carroll (2015), BE focuses on the rightness and fairness of business as well as organizational structures and functions, however mostly from the perspective of what businesses should do, not from what they should not do. SM naturally concentrates on everything that concerns managing the company's relationship with and responsibilities toward its stakeholders as well as understanding the stakeholders' stakes. The aim of SM is to establish and maintain fair and effective relationships with the stakeholders as well as to continuously improve stakeholder management and culture (Carroll, 2015). According to corporate citizenship (CC), companies, just like individuals, are citizens (Carroll, 2015). Therefore, they must fulfil certain expectations and responsibilities to achieve legitimacy and acceptance. The fact that the term CC has recently become rather popular (Carroll, 2015) supports the statements made in the beginning of this chapter, according to which businesses are increasingly expected to take part in the societal development.

According to Carroll (2015), the concept of sustainability (SUS) is based on the Brundtland Commission's (1987, as cited by Carroll, 2015) definition of sustainable development: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Today, sustainability is often defined using the triple bottom line (TBL) framework originally introduced by John Elkington (Carroll, 2015). According to this framework,

sustainability consists of three dimensions: environmental, social and economic (Carroll, 2015).

Certainly, all of these concepts seem to be somewhat embedded in CSR, which according to Carroll (2015) describes the relationships between businesses and the society. Carroll (1979, as cited by Carroll, 2015) described CSR as something that is concentrated on fulfilling the economic, legal, ethical and discretionary expectations posed by the society. According to Carroll (2015), the economic and legal expectations are required from organizations, the ethical expectations are expected and the discretionary ones are desired. In other words, CSR is divided into compliance obligations and activities that are not required by law, the latter of which is becoming increasingly emphasized by both internal and external stakeholders of companies (Carroll, 2015). Dahlsrud's (2008) findings support the role of this voluntariness, i.e. going beyond legal requirements, as an essence of CSR. Carroll (2015) also gives CSR another two-dimensional definition, according to which it consists of protecting (avoiding negative and harmful impacts on the society) and improving (contributing to and creating positive effects to the society.

Dahlsrud's (2015) findings show that the triple bottom line is an important part of the definition of CSR, along with the stakeholder dimension and voluntariness. To conclude, both Carroll's (2015) and Dahlsrud's (2008) findings show that CSR describes the relationship between the society and the corporate world as well as the social, environmental and economic, legally binding and voluntary responsibilities a company has towards the society and its stakeholders.

In this study, the focus will be on the environmental dimension of CSR, i.e. corporate environmental responsibility (CER) (Gunningham, 2009 and Holtbrügge & Dögl, 2012). According to Egri and Ralston (2008, as cited by Holtbrügge & Dögl, 2012), when it comes to research on CSR-related topics, CER has not been popular. Holtbrügge and Dögl (2012) suggest that one reason for this might be a lack of academic CER experts due to the interdisciplinary nature of the topic. Recently, however, the notable changes in climatic and environmental conditions have led to increased awareness of and interest in CER (Gunningham, 2009; Hart, 1995 and Starik & Rands, 1995, as cited by Holtbrügge & Dögl, 2012).

Besides a subset of CSR, CER has been defined as decisions (Huckle, 1995, as cited by Holtbrügge & Dögl, 2012) and practices that seek to mitigate environmentally harmful effects (protect) and create environmentally beneficial effects (improve) (Gunningham, 2009). These decisions and practices encompass for example pollution prevention, material and energy efficiency efforts, the development of clean technology and product stewardship (Gunningham, 2009).

Gunningham's (2009) definition of CER also includes the voluntariness aspect discussed earlier with respect to CSR. Both Huckle (1995, as cited by Holtbrügge & Dögl, 2012) and Gunningham (2009) also mention the alignment of CER with the company's other interests. According to Gunningham (2009), CER practices may for example be linked to new market opportunities, cost savings, efficiency, corporate image and environmental risk reduction. From these remarks it could be inferred that CER, the environmental dimension of CSR, is

something that should be conducted in balance with the two other pillars of TBL, the social and economic. The management of the balance between the TBL pillars is also supported by the ISO 14001 standard (International Organization for Standardization, 2015). The improve and protect division of CER also refers to it being closely related to CSR. Overall, according to these definitions, CER could indeed be defined similarly to CSR, however with a particular focus on the environmental dimension of the TBL.

3.2.2 Organizational environmental change

The interest regarding corporate responsibility has shifted from the mere examination of the concepts of CSR, CER and their motives towards how they are implemented in organizations (Kudlak & Low, 2015). The implementation of CSR and thereby also CER in organizations can be understood as organizational change processes (George & Jones, 1996, as cited by Maon et al., 2009), which include monitoring, learning about and aligning with the surrounding context (Maon et al., 2009). In this study, the implementation of CER into the organization will thus be called organizational environmental change.

Based on Anderson and Ackerman-Anderson's (2010) definition of transformational change, organizational environmental change today could be described as increasingly transformational. Transformational change is characterized by complexity, radicalness and comprehensiveness (Anderson & Ackerman-Anderson, 2010). Kotter (1996) describes transformational changes in today's dynamic environment as numerous, large, complex and emotionally charged. According to Anderson and Ackerman-Anderson (2010), for a transformational change to occur, a considerable internal shift must happen regarding e.g. mindsets, behaviour, organizational culture as well as people's understanding of the organization and its context. Furthermore, in transformational change, the outcome is often uncertain in the beginning of the process. Anderson and Ackerman-Anderson (2010) state that the result of a transformational change is in fact defined by the change process itself. Cora (2013, p. 72) defines environmental transformation as "a process that shapes an organization's response to the changing nature of the regulatory environment, while focusing on the development of new combinations of concepts, capabilities, people, and organizations". According to Cora (2013), this process requires creativity, understanding and awareness of the environmental challenges, cooperation and networking with stakeholders as well as learning and utilizing new technologies and operations.

In this study, I examined a phenomenon that in this case is called organizational environmental change, as mentioned in the first paragraph of this chapter. When it comes to this study, the phenomenon can be understood in two ways. On one hand, it includes the comprehensive, continuous environmental transformation process, the response to the environmental dimension of the sustainable development megatrend. On the other hand, it includes the cyclical development process that the ISO 14001 environmental management system requires. Both of

these contribute to the implementation and development of CER in the organization. While the EMS drives the implementation of CER in the organization and thereby contributes to the environmental transformation, the culture, strategies and values changed during the environmental transformation process again boost the implementation of the EMS. Therefore, although the focus of this study lies on the implementation process of the EMS, the environmental transformation process will be discussed closely along with it.

On one hand, organizational environmental change, including the environmental transformation as well as the cyclical development required by the EMS can be seen as planned change. The part of Cora's (2013) definition of environmental transformation stating that it focuses on the internal development of the organization, refers to this planned change approach. Planned change is a proactive process that aims at achieving previously set objectives and long-term benefits (Huong, 2014). It is an incremental development process with a strong focus on internal processes, strategies, resources and performance.

However, organizational environmental change could also be understood to have an unplanned nature. It is, for example, very much dependent on the dynamic stakeholder, societal and environmental pressures (Cora, 2013) that can be difficult to foresee. Unplanned change is a reactive response to the external and internal pressures and changes (Huong, 2014). An unplanned change often focuses on a specific part of an organization and can be radical and short-term focused. According to Todnem By (2005), the unplanned (or emergent) change management approach concentrates on the readiness for and facilitation of change rather than pre-planning the process.

To consider all of the remarks made above, I decided to examine the implementation of the EMS as well as the organizational environmental change process from the point of view of different change management models. Furthermore, when it comes to the implementation of an EMS, change management has been seen as an important tool contributing to not only a superficial adoption but a thorough internalization of an EMS (Ronnenberg et al., 2011).

3.3   Managing an organizational change process

According to William A. Pasmore and Richard W. Woodman, organizational change processes have interested scholars for long, and several theories have been developed to help understanding and leading them (Shani & Noumair, 2017, 1st chapter). In the following, I will present and discuss a couple of popular change models (Galli, 2018) that can be utilized in managing an organizational change process.

Kotter's 8-step change model is designed for leading the kind of comprehensive change (Seijts & Gandz, 2018) or transformation (Kotter, 1996) that organizational environmental change can be seen to represent. Kotter's change model has been seen as a revised, more detailed version of Kurt Lewin's change

management model (Galli, 2018), which consists of three phases: the behavioural thaw (unfreezing), the change (transition) and the recrystallization of behaviours (change) (Talmaciu, 2014, as cited by Galli, 2018). Although Kotter's model seems to align with many of Lewin's ideas, it provides more support to the management of people and overall, to the practical implementation of change (Galli, 2018).

Kotter's model is entirely based on John P. Kotter's personal, empirical experience in business and research, and his book, "Leading Change", published in 1996, has been written without any references to scientific literature or other outside sources (Appelbaum et al., 2012). The book has, nevertheless, been a remarkable success and, according to Appelbaum et al. (2012), a key scientific reference in the field of change management. Todnem (2005, as cited by Appelbaum et al., 2012) suggests that the empirical basis of the model might in fact be the very reason for its success, since so many of the current change management approaches mostly lack empirical evidence. When it comes to this case study, I found the idea of utilizing Kotter's model fascinating due to its real-life-foundation.

Kotter's model has been understood as a planned change model (Huong, 2014). It has been described as structured (Day & Atkinson, 2004, as cited by Pollack & Pollack, 2015), sequential (Day & Atkinson, 2004, as cited by Pollack & Pollack, 2015 and Pfeifer, Schnitt & Voigt, 2005, as cited by Pollack & Pollack, 2015) and linear (Nitta, Wrobel, Howard & Jimmerson-Eddings, 2009, as cited by Pollack & Pollack, 2015). Kotter (1996) underlines the importance of sequence, stating that the reason behind unsuccessful change efforts is often the lack of a stable background work.

Kotter's linear, stepwise approach to change has been criticised for its lack of flexibility (Sikorko, 2008, as cited by Pollack & Pollack, 2015 and Appelbaum et al., 2012). According to Sikorko (2008, as cited by Pollack & Pollack, 2015) Kotter's model does not sufficiently consider the different problems and issues that might become apparent during the change. These problems may include for example resistance to change and lack of commitment to change (Appelbaum et al., 2012), which are both associated with the soft approach of change management (Lies, 2012 and Talmaciu, 2014). Burnes (1996, as cited by Applebaum et al., 2012) in turn, criticises the fact that Kotter's model does not sufficiently consider organizations' individual needs and characteristics. For instance, some of the phases of Kotter's model may not be relevant or possible for some transformation processes (Appelbaum et al., 2012). In his comparative analysis of popular change models, Galli (2018) also concludes that Kotter's model was one of the models that were the most limited when it came to leading people through change. Due to all these remarks as well as to discuss some more recent viewpoints besides the already rather classic Kotter's model, I have decided to consider three different change models in this study: Kotter's model, PDCA (plan-do-check-act) model and MINDSPACE model.

The PDCA model brings a cyclical, constantly updating view besides Kotter's linear approach and thus, can be seen to contribute to the unplanned form of organizational environmental change. The PDCA model forms a basis

for the ISO 14001 environmental management system (International Organization for Standardization, 2015), which will be discussed in chapter 4. Therefore, it can be seen first and foremost as the model behind the cyclical development process required by the EMS. The MINDSPACE model supplements Kotter's model by concentrating on the human and behavioural, soft factors of a change process. The purpose of looking at organizational change from these different viewpoints is to contribute to as comprehensive an understanding of the phenomenon as possible. In addition to the three change and development models, the SWOT (Strengths, Weaknesses, Opportunities, Threats) framework will be introduced and discussed, for the reason that it has been associated with a certain step of Kotter's model (Kotter, 1995, as cited by Huong, 2014). Furthermore, a modified version of the framework has been applied in the chapter 6.3.

3.3.1 Kotter's 8-step change model

Kotter's model consists of the following eight steps (FIGURE 3):

1. Establish a sense of urgency.

According to Kotter (1996), the imbalance of complacency and urgency is one of the most fatal factors behind an unsuccessful transformation. Too much complacency and too little sense of urgency may lead to the overestimation of the organization's ability to initiate and undergo significant changes, the underestimation of the difficulty of getting people to contribute to the change, the blindness to how one's own actions can resist the change as well as to the lack of patience (Kotter, 1996). People must understand the need for the change at hand (Kotter, 1996) and be aware of the organization's constant need to be responsive to change (Kotter 2012, as cited by Galli, 2018). According to Appelbaum et al., 2012, the idea of creating an understanding of the necessity and urgency of the change is supported by other scholars as well (e.g. Armenakis et al., 1993; Lewin, 1946; Coch & French, 1948; Bandura, 1986; Pettigrew, 1987 and Nadler & Tushman, 1989). According to Neri and Mason (2008, as cited by Galli, 2018), developing an understanding of the reasons behind the change can help tackle change resistance.

 Kotter (1996) explains that there are numerous reasons behind too much complacency. One of them is having no threats or crises visible. Furthermore, Kotter (1996) states that low targets, low performance standards and overly optimistic talk can contribute to a certain blindness to urgency. According to Kotter (1996), internal planning and control systems should also not be designed, or as Kotter puts it, "rigged" so that it is too easy to meet the targets. Kotter (1996) also believes that if the personnel's performance targets are too narrow, the responsibility for the overall business performance might not be experienced collectively. Another contributor to too much complacency, according to Kotter (1996), is insufficient or missing feedback from external sources. Buchanan, Fitzgerald, Ketley, Gollop, Jones, Lamont, Neath and Whitby (2005) cite Rimmer et al. (1996), Jacobs (2002), Dale et al. (1997 a, b), Dale et al. (1999), Kemp et al. (1997) and

Reisner (2002) who also underline the importance of contextual and stakeholder feedback, support and pressure in managing and sustaining change. Interaction with external stakeholders can be supported by establishing encouraging attitudes towards those who try to initiate honest discussion (Kotter, 1996). Ultimately, according to Kotter (1996), it is also typical for the human nature to avoid difficulties and change.

According to Kotter (1996), to enforce the feeling of urgency, the sources of complacency must be removed or at least their impact must be reduced. This requires good leadership and bold actions as well as a certain autonomy for middle and lower-level management. One practical exercise an organization can do to examine its status quo and perhaps find sources of complacency is the SWOT analysis (Kotter, 1995, as cited by Huong, 2014). The SWOT analysis is introduced more closely in chapter 3.3.3. Scholars have also highlighted the importance of communication in increasing the sense of urgency. Appelbaum et al. (2012) cite Ginsberg and Venkatraman (1995), as well as Kotter (1995), saying that a high frequency of implications to change may contribute to an increased feeling of urgency. According to Armenakis et al. (1993, as cited by Appelbaum et al., 2012), not only words but also silent messages reflecting support towards the change, such as resources and effort used to further it, may have a key role in creating change momentum.

Kotter (1996) emphasizes that the purpose of creating urgency is not provoking fear or anxiety. However, his approach to creating urgency focuses heavily on the removal of factors that contribute to complacency and not on the possible support mechanisms for urgency. Kobi (1996, as cited by Appelbaum et al., 2012) takes a different viewpoint, pointing out that emphasizing and illustrating the attractiveness of the change, providing clear expectations, manifesting the realizability of the change and developing a positive attitude towards the change should also be considered as supporting factors for the sense of urgency and the readiness for change. Likewise supporting the positive pathway to the feeling of urgency, Beard and Rees (2000, as cited by Ronnenberg et al., 2011) suggest that introductory environmental training sessions can serve as a way to raise awareness of the change in the beginning of it.

2. Create a guiding coalition to lead and manage the change.

Kotter (1996) believes that for the change to be implemented successfully, it must be led by a guiding coalition, a team with position power, relevant expertise, credibility and leadership skills. To efficiently forward the change, the guiding coalition should have these characteristics in the eyes of all important stakeholders (Rimmer et al., 1996, as cited by Buchanan et al., 2005). The basis for a good and functional guiding coalition is teamwork based on mutual understanding, trust and a common goal (Kotter, 1996). Buchanan et al. (2005) cite Dale et al. (1997 a, b), Dale et al. (1999) and Kemp et al. (1997) who support this view, though adding that the credibility and confidence also require consistency and strong priorities.

According to Kotter (1996), being disconnected from others besides one's own immediate team can contribute to distrust within the organization. To prevent individuals' commitment from directing merely towards their own departments, friends, other immediate groups or their own interests, it is important to create a mutual goal and commitment to strive towards it. According to Kotter (1996), leaders are the ones who create and communicate the strategy and vision and overall, contribute to the creation of the commitment towards mutual success. As per Kotter's (1996) definition, leadership is more long-term-focused than management, which Kotter (1996) defines as the establishment of specific plans and budgets to implement the strategy.

Although Kotter (1996) specifically emphasizes the role of great leadership, he also particularly highlights the importance of having the right combination of leadership and management expertise in the guiding coalition leading the change. According to Kotter (1996), for the change to succeed, almost everyone in the guiding coalition should have great leadership or management skills. Approximately half of the people in the guiding coalition should have great skills in both leadership and management. An alignment can be found between this idea and the theory behind the General Electric's Change Acceleration Process model (CAP), according to which quality (Q) and acceptance (A) contribute to the effectiveness (E) of a change: $Q \times A = E$ (Polk, 2011, as cited by Galli, 2018). Based on Kotter's definitions of leadership and management, it could be said that management largely contributes to the quality and leadership to the acceptance of the change. The CAP model is very similar to Kotter's model, overall.

3. Develop a vision and a strategy.

To overcome resistance and to get people to work together to initiate, enhance and consolidate change, the organization needs to develop a vision (Kotter, 1996). Kotter (1996) defines vision as an imaginable, desirable, feasible, flexible and communicable picture of the future. According to him, a good vision also includes an explanation of why the certain kind of future should be achieved. According to Kotter (1996), the purpose of a vision is to provide this direction for the change and to motivate people, even a considerable number of them, to work towards a certain direction regardless of possible, momentary discomfort. Buchanan et al. (2005) cite Jacobs (2002), Pettigrew (1985) and Dawson (1994) who agree with Kotter's (1996) view, further reminding that for a change to persist and continue, it must always be aligned with the organization's direction as an entity.

A clear direction for change makes decision-making more determined and targets resources more efficiently towards the desired future (Kotter, 1996). According to Kotter (1996), a certain degree of autonomy in decision-making, that a clear vision enables, reduces unnecessary coordination work and increases efficiency. Throughout his book, Kotter (1996) keeps underlining the fact that a transformational change may require extreme flexibility and sacrifices. The mo-

tivation to achieve the vision may encourage the kind of work that does not necessarily go along with people's short-term, individual interests or that requires getting out of one's comfort zone.

4. Communicate and share the vision.

It is not easy getting large amounts of people to understand a vision and accept it (Kotter, 1996). However, in case the individuals working in the organization do not understand or accept the vision, they may not engage in the next steps of the change process. If the vision is understood wrong or incompletely, resources might also be directed in an unintended or undesired way.

Simplicity and clarity of language play a key role when aiming at the understandability of the vision (Kotter, 1996). A simple message reduces the feelings of confusion and alienation that complex language fraught with jargon may lead to. According to Kotter (1996), even complex ideas can be put more simply and shortly by using examples, analogies and metaphors. Communicating through many different forums enforces the message and increases the possibility of it to be heard and understood (Kotter, 1996). Furthermore, repetition in the form of words and different kinds of reminders tends to forward and amplify the message.

Action speaks more than words, even in the case of communicating a change vision. Kotter (1996) states that the (in)consistency between the key change agents', especially the top management's words and actions is crucial in how the message is accepted and acted upon. To maintain the credibility of the message, all inconsistencies with it should also be addressed and carefully explained (Kotter, 1996). If there is trust within the organization, transparent communication like this can contribute to more credibility and trust.

Finally, Kotter (1996) believes that to accept a message, most people need an opportunity to challenge it, discuss it and get answers to their questions about it. Therefore, change communication should be collective and interactive. Kotter (1996) further highlights that even good communication of the vision is not enough if the vision itself is not accepted both intellectually and emotionally. These questions need to be addressed both during the creation of the vision and the communication of it.

5. Empower employees for broad-based action.

Kotter (1996) defines employee empowerment as removal of the barriers that prevent employees from contributing to the implementation of the change vision. He identifies four key barriers: structures, skills, systems and supervisors. Structural factors resisting change can, depending on the situation, include for example costly structures, fragmented organizational or operational structures resulting in fragmented resources and responsibilities; too independent, isolated organizational structures or too many layers of managers and decision-makers resisting the messages and initiatives coming from lower organizational levels

(Kotter, 1996). Indeed, the roles and responsibilities regarding the implementation of the change must be clear to enable a strong and consistent driving force for it (Dale et al., 1997 a, b; Dale et al., 1999 and Kemp et al., 1997, all cited by Buchanan et al., 2005).

According to Kotter (1996), another obstacle for a successful implementation of change is the lack of relevant skills. Building up and developing this skill-set requires careful consideration of what kind of behaviour changes, skills and knowledge are needed, what kind of and how much training is needed and what time span the trainings should be organized within. Kotter (1996) particularly highlights the importance of attitude training in addition to the skill-oriented training. Furthermore, the training must be continuous, i.e. it requires follow-up and support systems to fulfil its purpose. Kotter (1996) also reminds that individuals have different skillsets consisting of new and old, valid and outdated knowledge and habits, and this must be considered in planning and conducting the trainings.

An organization should also make sure that systems, especially HR and information systems are not restricting the implementation of the change and that they are in line with the vision (Kotter, 1996). In other words, the change should be promoted by e.g. performance evaluation, compensation, promotion decisions as well as recruiting and hiring systems. Overall, for the change to succeed and sustain, the use of development tools and systems should be planned and consistent (Dale et al., 1997 a, b; Dale et al., 1999 and Kemp et al., 1997, all cited by Buchanan et al., 2005).

Finally, organizations often have powerful workers and managers who do not believe in the change or for other reasons, for example old habits and behaviours, discourage the change (Kotter, 1996). According to Kotter (1996), the best way to deal with situations like these is an honest dialogue. This kind of confrontation of the situation is often considered difficult, but Kotter' (1996) believes that it is of crucial importance, because not only does the change slow down due to these individuals, but the discouragement may also spread when people see that the situation is not addressed.

Although Kotter's model does consider employee empowerment and incorporates an idea that all the organizational levels and functions should contribute to the change process, it has also received criticism about a lack of democracy (Reissner et al. 2011, as cited by Pollack & Pollack, 2015). Galli (2018), for example, criticises Kotter's model about its top-down approach. According to him, this is shown for example in that the lower levels of the organizational hierarchy do not have a say when it comes to developing the vision and the strategy. This should be considered when following Kotter's framework for change management.

6. Generate short-term wins.

According to Kotter (1996), changes are time-consuming processes. To keep up the enthusiasm and belief in the change and to provide the change process sufficient credibility and urgency, the organization should make the short-time wins

made during the transformation process, visible. This can be done for example by dividing the long-term change process into smaller, shorter projects that can show visible improvements and be followed up within a shorter time frame.

However, not any improvements can be considered as short-term wins. Kotter (1996) lists three characteristics that a short-term win must have: (1) it is visible to a wide audience within the organization so everyone can assess it, (2) it is unambiguous and (3) it is clearly related to the change effort and not achieved at the expense of the long-term transformation process. Kotter (1996) also points out that to serve their purpose, the short-term wins must be genuine, i.e. not forced just for the sake of achieving them. The short-term wins are a result of a carefully organized and implemented plan.

Kotter (1996) points out that it is usual that organizations are not committed enough to produce short-term changes because they feel like there are not enough resources to contribute to both short-term and long-term results. This is why the short-term projects and the long-term change process should be carefully aligned with each other. According to Kotter (1996), when it comes to creating short-term wins, management is particularly crucial, since its role is to systematically target and budget objectives and to plan, organize and control the implementation of the plans.

7. Consolidate gains and produce more change.

To keep the long transformation process on track and the urgency level up regardless of adversities or on the other hand, the feeling of triumph due to the short-term wins, the organization needs to produce more change, to get help and support, to ensure sufficient leadership and management and to eliminate unnecessary interdependencies (Kotter, 1996). According to Kotter (1996), in a transformation process, change naturally produces and requires more change. Today's businesses are more complex than ever due to increased competition and a faster-changing environment (Kotter, 1996). This complexity and the interdependence of the organization's constituents makes it difficult to change only one factor at a time or to anticipate the impacts of a single change. Consequently, a transformation process requires numerous changes at the same time.

According to Kotter (1996), managing multiple changes at the same time would be impossible without involving and training more people to help contribute to different aspects of the transformation process when needed. Managers and employees on lower organizational levels must also be involved in the leadership, management and implementation of the changes. According to Kotter (1996) it is utterly impossible for the mere senior management to coordinate and manage all the details of each of the change processes. Instead, they should concentrate on leadership – maintaining and communicating the shared vision and purpose as well as taking care of the sufficient urgency level. Some of the interdependences and complexities within the organization may have become unnecessary over time (Kotter, 1996). Because these interdependences still affect the

transformation process by hindering necessary changes, they should be identified and eliminated. In this constant updating process, the two-way, interactive feedback and communication may prove beneficial.

8. Anchor the changes in the culture.

Lastly, Kotter (1996) underlines the importance of leadership and organizational culture in maintaining the changes. He defines culture as "norms of behaviour and shared values among a group of people" (Kotter, 1996, p. 148). Social and cultural norms are the expected, desired or common forms of behaviour within a group (Axelrod, 1986 and Burke & Payton-Young, 2011, both cited by Dolan et al., 2012). Shared values, according to Kotter (1996), are goals and concerns mutual to most of the group, that often affect the group's behaviour. Organizational culture can be fragmented to subcultures specific to a certain part of the organization (Kotter, 1996). According to Kotter (1996) culture is a central element in anchoring a transformation both in good and in bad because it influences our thinking and behaviour so powerfully, it can simultaneously lead the thinking and behaviour of massive entities and finally, it is highly unconscious and therefore difficult to discuss or address. This will help people accept the change not only intellectually and logically but also emotionally (Kotter, 1996).

In Kotter's (1996) view, the changes that the transformation requires in the organizational culture or cultures must be made as the last step of the transformation process. He believes that culture is something that changes through the changes in behaviour, not as a result of any direct measures. He reminds that being familiar with the organizational culture is, however, important regarding the success of the rest of the change process, too. The changes in behaviour and culture are enhanced by the visible benefits that the behavioural changes yield (Kotter, 1996). Anchoring the changes in the organizational culture requires active communication and interaction within the organization as well as possible alterations in the organizational structures and processes (Kotter, 1996). While also acknowledging the importance of culture in anchoring the changes in the organization, Buchanan et al. (2005), however, particularly highlight the role of the change management process as a continuous entity in sustaining changes. Buchanan et al. (2005) cites Senge et al. (1999) as well as Senge and Kaeufer (2000) saying that for the change to become sustainable, the change sustainability must be viewed as an inseparable phase of the change management process.

1	Establish a sense of urgency.
2	Create a guiding coalition to lead and manage the change.
3	Develop a vision and a strategy.
4	Communicate and share the vision.
5	Empower employees for broad-based action.
6	Generate short-term wins.
7	Consolidate gains and produce more change.
8	Anchor the changes in the culture.

FIGURE 3 Kotter's 8-step change model (Kotter, 1996).

3.3.2 PDCA model

The PDCA (plan-do-check-act) model, i.e. the Deming cycle of continuous improvement, is a development model often used in the context of quality management (Deming, 2000 and Choo, Linderman & Schroeder, 2007, as cited by Matsuo & Nakahara, 2013). Consisting of four simple steps: planning (P), implementing (D), following up the results (C) and changing the planning and actions according to the results (A) (Dahlgaard & Kanji, 1995, as cited by Matsuo & Nakahara, 2013) the PDCA model can be applied to different kinds of development and problem-solving-related questions. For example, Matsuo and Nakahara (2013) have studied the PDCA model's application to workplace learning whereas Sitnikov and Bocean (2012) have utilized the PDCA model in building a framework to organizational sustainable change.

The PDCA model forms a basis for the ISO 14001 EMS (International Organization for Standardization, 2015). In ISO 14001, "plan" stands for environmental objectives, policy and processes, "do" stands for the implementation of the processes, "check" for monitoring, measuring and reporting and "act" for the continuous improvement. As FIGURE 9 in chapter 4.2 shows, according to ISO 14001, the organization's context affects the scope of the management system and the PDCA cycle, and the central force driving the cycle is leadership.

3.3.3 SWOT analysis in change management

SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis is a multipurpose business management tool used for example in strategic planning, marketing, decision making and other complex business situations (Helms & Nixon, 2010). In a SWOT analysis, the strengths and weaknesses of the studied subject and the opportunities and threats regarding its relation to its surrounding environment are analysed (Mayer & Vambery, 2008). Through this simple framework, even complex situations can be viewed and assessed from internal and external perspectives. This helps in identifying relationships between different factors and in creating plans to follow (Proctor, 1992, as cited by Helms & Nixon, 2010).

According to Mayer and Vambery (2008), organizational changes or changes in its relationships with external factors can also be monitored and followed with the help of SWOT analyses. Lindborg (2003, as cited by Helms & Nixon), in turn, sees that the SWOT analysis "embraces" change in that it simultaneously helps to anticipate the factors that might affect the studied subject in the future and contributes to developing the capabilities and skills required in the present and in the future. Consequently, the SWOT framework can be utilized in managing the organizational change process, but also in managing people through change.

3.4   Leading people through change – the MINDSPACE framework

As mentioned earlier, compared to some other change models, Kotter's model is somewhat limited when it comes to leading people through change (Galli, 2018). To provide more insight into the psychological and human aspects of change management, I will next discuss the MINDSPACE framework by Dolan et al. (2012). The framework has proved effective in public policy contexts regarding e.g. health, finance, and climate change (Liu, Vlaev, Fang, Denrell & Chater, 2017 and Dolan et al., 2012) but according to Liu et al. (2017), it can also be applied in strategy. This is because many of the challenges we face in competing, organizing, and collaborating are behavioural (Liu et al., 2017). While developing the framework, Dolan et al. (2012) have particularly aimed at making less coercive policies, which for example the ISO 14001 environmental management standard can be seen as, work better. Due to these remarks and because the framework is rather new and has its basis in the latest studies in the behavioural sciences (Liu et al., 2017), I thought it would be interesting and beneficial to apply it in the context of environmental and change management, along with the more traditional Kotter's and PDCA models. Since the MINDSPACE model does not incorporate an order, Prochaska's Transtheoretical Model of Behaviour Change (TTM) will provide a direction for the process of behaviour change (FIGURE 4).

According to Dolan et al. (2012), there are two ways to look at and influence our decision-making and behaviour: the cognitive model that is based on our conscious thinking and the context model that is based on the more automatic ways we response to the factors surrounding us. Influencing people's behaviour has traditionally been seen from the point of view of the cognitive model or the rational choice paradigm (Elster, 1986, as cited by Dolan, 2012). However, this approach based on the cognitive model of behaviour only explains a part of our behaviour (Webb & Sheeran, 2006, as cited by Dolan et al., 2012). Thus, to understand our behaviour as a whole and to influence it, it is important to understand the so called contextual cues that affect our behaviour along with our conscious thinking (Dolan et al., 2012). The nine contextual cues that form the MINDSPACE framework (TABLE 3) are presented in the following:

1. Messenger

We have a strong tendency to weigh the information we receive based on the authority and credibility of the messenger, i.e. the person who communicates the information to us (Dolan et al., 2012 and Liu et al., 2017). The credibility and authority of the messenger derives from many different factors, such as the similarities we find between ourselves and the messenger (Durantini et al., 2006, as cited by Dolan et al., 2012), the familiarity of the messenger to us (Liu et al., 2017) and the messenger's expertise (Liu et al., 2017 and Dolan et al., 2012). Furthermore, our feelings towards the messenger affect how we find the message (Dolan et al., 2012). The message is more likely to be rejected if the audience dislikes the messenger (Cialdini, 2007, as cited by Dolan et al., 2012). We may also knowingly assess the credibility of the messenger by regarding whether the message is accepted by a wider audience and on the other hand, whether the messenger maintains their stance in different situations or keeps changing it (Kelley, 1967 and Lewis, 2007, both cited by Dolan et al., 2012).

To enhance the acceptance of new information and to encourage the adoption of changes, building credibility and trust between the messengers and the receivers is crucial (Liu et al., 2017). This finding is perfectly aligned with Kotter's (1996) statements about the importance of trust and credibility within an organization during a change process. Furthermore, these remarks might be useful in determining what an effective, powerful guiding coalition would look like in a specific organization. On the other hand, our tendency to value messages from those who are similar or familiar to us may be a hindering factor in innovating and venturing (Liu et al., 2017). This is because we tend to overvalue those ideas or practices presented by sources close or similar to us and undervalue the ones that come from further in the network. This is not an easy challenge to overcome, but some firms have found solutions to it. For example, for Draper Fisher Jurvetson (DFJ) a suitable and well-functioning way to find valuable information has been to attract it through publicly identifying as an interested seeker of ideas on the topic – an approach very different from the traditional, secretive approach

(Bohman, 2009, as cited by Liu et al., 2017). Rimmer et al. (1996, as cited by Buchanan et al., 2005) agree with this view, underlining the importance of stakeholder cooperation, networking and support in seeking best practices.

2. Incentives

We tend to assess the outcomes of changes based on reference points, i.e. where we look at the change from (Kahneman & Tversk, 2000, as cited by Dolan et al., 2012). The reference point may affect how significant or small an incentive is needed to influence behaviour (Thornton, 2008, as cited by Dolan et al., 2012). Furthermore, the dislike we feel towards outcomes that are below our reference points (losses) tends to be stronger than the satisfaction we feel due to outcomes of the similar magnitude, that are above our reference points (gains) (Dolan et al., 2012 and Liu et al., 2017). An interesting, powerful psychological tendency that affects for example our responsiveness to the pressures posed by the environmental and climate threats is that we tend to disregard the future when sacrifices are required in the present (Hardisty & Weber, 2009, as cited by Dolan et al., 2012). For example, new ideas and changes may feel more disadvantageous than beneficial because regardless of their possible long-term benefits, compared to the present they feel like a loss or a disruption (Denrell & March, 2001, as cited by Liu et al., 2017).

Liu et al. (2017) recommend considering these psychological tendencies when planning incentive systems. Thaler et al. (1997, as cited by Liu et al., 2017) suggest that rewards regarding gains should be at least twice as big as the sanctions regarding losses. It is important to recognize the biases related to our thinking, because our understanding of the reality may have an impact on the change success. For example, Rimmer et al. (1996, as cited by Buchanan et al., 2005) consider the fact that the long-term perceived benefits are greater than the perceived costs, an important determinant of change sustainability.

3. Norms

Evidence suggests that we tend to follow others, even unconsciously (Chartrand & Bargh, 1999, as cited by Dolan et al., 2012) or in ways that are difficult to explain rationally (Latane & Darley, 1968, as cited by Dolan et al, 2012). This is why when encouraging people to behave in a certain way, indicating the desirability of the norm may work (Linkenbach & Perkins, 2003, as cited by Dolan et al., 2012). An even more efficient way to influence people's behaviour is to relate them to what other people have done in a precisely similar situation as they are in (Cialdini, 2003, as cited by Dolan et al., 2012) or to compare their performance with others in a similar situation (Allcott, 2009, as cited by Dolan et al., 2012).

4. Defaults

When making decisions, people tend to choose pre-set default options (Dolan et al., 2012 and Liu et al., 2017). Setting a default option has been shown to have a

significant impact on people's behaviour (Abadie & Gay, 2004; Johnson & Gold-stein, 2003; Johnson et al., 1993; Park, Jun, & MacInnis, 2000 and Halpern et al., 2007, all cited by Dolan et al., 2012) while, however, not restricting their possibility to choose. What the optimal default is depends on the target group (Dolan et al., 2012). In the context of health care, defaulting has been found to contribute to waste reductions, financial savings, increased value of patient care (Patel et al., 2014, as cited by Liu et al., 2017) as well as shorter hospital stays due to more efficient treatment (Kress et al., 2000, as cited by Liu et al., 2017). The shortened lead time, efficiency and increased customer value all indicate that in these cases, lean principles, which will be discussed more closely in chapters 3.5.2 and 3.5.3, were supported through the use of defaults.

Another purpose Liu et al. (2017) suggest that defaulting could be used for is avoiding mistakes. According to this idea, organizations should recognize two defaults for their efforts, success or failure. Recognizing the possibility of failure enables the organization to analyse the possible pathways to the imaginary failure and through this, find out what might go wrong during the effort. An opposite to this would be to recognize success as a default and pre-analyse the path towards the imaginary success, step by step, looking for the factors that could possibly lead to it. Backcasting could be seen as an extreme form of this exercise. Backcasting starts with defining a vision, after which a stepwise analysis works backwards to determine what should be done today and subsequently, to achieve the vision (Robinson, 1990; Dreborg; 1996 and Robèrt, 2000, all cited by Broman & Robèrt, 2017).

5. Salience

Our behaviour is influenced by what draws our attention (Kahneman & Thaler, 2006, as cited by Dolan et al., 2012), what seems novel to us or what seems otherwise relevant to us (Liu et al., 2017). Therefore, our behaviour can be influenced by making the critical aspects of some choice or behaviour draw our attention or seem relevant to us (Dolan et al., 2012).

6. Priming

Priming means that our behaviour can be influenced by exposing us to certain experiences, such as words, sights, smells or sensations (Dolan et al., 2012). These experiences lead to unconscious associations in our minds, that affect our actions and choices. Based on this, it can be inferred that it is important to align the environment with the desired direction of change (Prochaska et al., 1992; Prochaska et al., 2001 and Abrash Walton, 2016, all cited by Griffiths, 2018). Because priming happens unconsciously and steering stimuli we constantly receive from our surroundings are unpredictable, our behaviour may also appear unpredictable and irrational (Liu et al., 2017). Interestingly, Liu et al. (2017) point out that this is one reason why plans may sometimes be difficult to implement successfully.

One example of how priming could be used in organizations is to extend people's viewpoints and avoid biased thinking by asking them to generate more

reasons to support their stance (Schwarz et al., 1991, as cited by Liu et al., 2017). This may contribute to a specific viewpoint feeling less convincing and thereby give more room to other possible ideas and realizations. The Five Whys method can be seen as somewhat related to this kind of thinking. The process encourages to identify the accurate and relevant causes to a problem while avoiding hesitated or biased assumptions (Kohfeldt & Langhout, 2012). First, the participants try to find five explanations for why the problem has occurred. The most probable or valid answer is then chosen and next, the participants aim to find five possible causes for that. This cycle is repeated five times.

7. Affect

Provoking emotions has a potential to powerfully influence our behaviour (Dolan et al., 2012 and Liu et al., 2017). The impacts emotions have on us can be automatic and decisions-making based on emotions more rapid than rational decision-making (Dolan et al., 2012). Emotions can, in themselves, cause chains of events, because our reactions affect the reactions of others, as well (Liu et al., 2017). Griffiths et al. (2018) cite Prochaska et al. (1992), Prochaska et al. (2001) and Abrash Walton (2016), saying that having negative feelings, such as fear and anxiety about the possible failure of change and positive feelings, such as inspiration and hope about the success of change, fosters change.

8. Commitment

Commitment is driven by conscious factors, such as people's awareness of their tendencies or the weakness of their will-power (Becker & Mulligan, 1997, as cited by Dolan et al., 2012), and unconscious factors, such as people's fear of exclusion and reputational damage resulting from a failure to align with their publicly made commitments (Bicchieri, 2006, as cited by Dolan et al., 2012). The higher the cost of failure, the more committed we tend to be (Dolan et al., 2012). Making a commitment public has been shown to enhance the desired behaviour, because a failure in fulfilling the public commitment would lead to reputational damage, a cost that is regarded high (Gine et al., 2008, as cited by Dolan et al., 2012).

These remarks go somewhat hand in hand with Prochaska's Transtheoretical Model of Behaviour Change (TTM), according to which contemplating on the impact of the change on oneself as well as others and associating negative emotions with the failure of change and vice versa, are important drivers of behaviour change (Prochaska et al., 1992; Prochaska et al., 2001 and Abrash Walton, 2016, all cited by Griffiths, 2018). Furthermore, commitment does not solely depend on rewards and sanctions but can also be driven by for example the fact that it has been written down (Dolan et al., 2012). Reciprocity is also an important driver of commitment (Dolan et al., 2012).

9. Ego

People tend to behave in ways that make them feel good about themselves (Liu et al., 2017) and that contribute to self-consistency (Dolan et al., 2012). Our tendency to support a positive self-image also extends to groups that we identify with (Dolan et al., 2012). Our tendency to promote self-consistency means that we want to align our behaviour and self-beliefs (Dolan et al., 2012). According to Festinger (1957, as cited by Dolan et al., 2012) in a situation where these two contradict, we prefer to adjust our beliefs rather than our behaviour. However, when we do adjust our behaviour for some reason, the resulting change in our self-image tends to steer us towards changing our behaviour more and more because we feel the need to align our beliefs and behaviour (Burger, 1999, as cited by Dolan et al., 2012). Therefore, even small changes in behaviour can contribute to more significant changes over time. Our tendency to support a consistent self-image also shows in that the higher expectations (self-belief) we are under, the better we perform (behaviour) (Rosenthal, 1974 and Rosenthal & Jacobson, 1992, both cited by Dolan et al., 2012).

These remarks go hand in hand with Kotter's statement according to which behavioural changes may eventually construct a basis for a broader, cultural change. In other words, Dolan et al. (2012) agree with Kotter in that the direction of change from behavioural changes to attitude changes could be more efficient than the other way around. According to the complexity theory, even small, uncoordinated changes can ultimately have a great, system level impact if feedback is given and received and if there is a possibility to respond to this feedback (Capra, 2007, as cited by Griffiths et al., 2018).

TABLE 3 The MINDSPACE framework for behaviour change (Dolan et al., 2012, p. 266).

MINDSPACE cue	Behaviour
Messenger	We are heavily influenced by who communicates information to us.
Incentives	Our responses to incentives are shaped by predictable mental shortcuts such as strongly avoiding losses.
Norms	We are strongly influenced by what others do.
Defaults	We 'go with the flow' of pre-set options.
Salience	Our attention is drawn to what is novel and seems relevant to us.
Priming	Our acts are often influenced by sub-conscious cues.
Affect	Our emotional associations can powerfully shape our actions.
Commitment	We seek to be consistent with our public promises, and reciprocate acts.
Ego	We act in ways that make us feel better about ourselves.
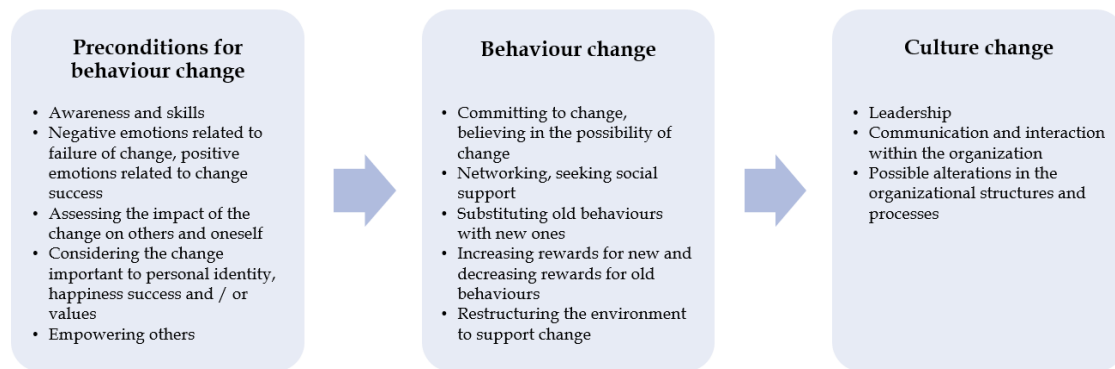
FIGURE 4 Remarks from Prochaska's Transtheoretical Model of Behaviour Change (TTM) (Prochaska et al., 1992; Prochaska et al., 2001 and Abrash Walton, 2016, all cited by Griffiths, 2018), combined with Kotter's (1996) remarks on culture change. According to Kotter (1996), culture change is a result of behaviour change.

3.5 Leadership and management

The definitions of the concepts "leadership" and "management" vary and overlap, and there is no unambiguous understanding of the meaning of the terms and the roles they represent (Nienaber, 2010). Kotter (1996) perceives leadership as creating and communicating a vision as well as contributing to the creation of the commitment towards mutual success and on the other hand, management as the establishment of specific plans and budgets to implement the strategy. Kotter (1996) also understands leadership as more long-term oriented than management. To define leadership and management as well as to illustrate the differences between the roles they involve, Bennis (1989, as cited by Darling & Nurmi, 2009, p. 206) suggests the following framework:

- Managers administer; leaders innovate.
- Managers maintain; leaders develop.
- Managers control; leaders inspire.
- Managers are short-term oriented; leaders long-term.
- Managers ask how and when; leaders ask what and why.
- Managers typically imitate; leaders originate.
- Managers accept the status quo; leaders challenge it.
- Managers do things right; leaders do the right things.

3.5.1 Transformational and transactional leadership

Holten and Brenner (2015) distinguish two complementary types of leadership related to an organizational change process. Transformational leadership represents psychological factors supporting change, including motivating, inspiring and steering people both on collective and individual levels (Bass, 1985, as cited

by Holten & Brenner, 2015) through providing role models, helping to identify with a shared vision, awakening pride and faith, encouraging "outside the box" kind of thinking as well as considering and fulfilling individual needs (Bass, 1999, as cited by Holten & Brenner, 2015). As mentioned earlier, even silent messages reflecting support towards the change, such as resources and effort, are important aspects of encouraging people to engage in change (Armenakis et al., 1993, as cited by Appelbaum et al., 2012).

Transactional leadership in turn, focuses on fostering compliance and alignment with the commitment and other outcomes of transformational leadership (Nadler & Tushman, 1989, as cited by Holten & Brenner, 2015). Both leadership styles have been shown to play a role in engaging managers in the change (Holten & Brenner, 2015). According to Holten and Brenner (2015), transformational leadership plays a particularly important role in the initial phase of change, contributing positively to followers' long-term change perceptions. However, they concluded that transactional leadership used in the initial phase of change had a negative impact on how the followers perceived the change.

Robertson and Barling (2013) show that leaders' pro-environmental behaviours at work as well as transformational leadership specifically focused on enhancing pro-environmental initiatives can contribute to employees' pro-environmental passion and behaviour. They also suggest that these leader behaviours and orientations may stem from environmental descriptive norms, i.e. what the leaders think most others do (Cialdini, 2007) when it comes to environmental responsibility. Furthermore, Beehr and Glaser (2005, as cited by Robertson & Barling, 2013) state that transformational leadership targeted toward specific behaviours demonstrate the leaders' values, thereby clarifying the employees' understanding of their roles.

3.5.2 Lean and green management

Lean management originates from Taichi Ohno's work regarding the Toyota Production System (TPS) (Ohno, 1988, as cited by Hallam & Contreras, 2016). To put it simply, the aim of lean philosophy is optimized cost, quality, and time in product delivery as well as prudent use of resources (Womack et al., 1990, as cited by Hallam & Contreras, 2016). The efficiency as well as lower costs and lead times are enabled by the reduction of all kinds of waste (Roosen & Pons, 2013; James-Moore & Gibbons, 1997 and Womack et al., 1990, all cited by Hallam & Contreras, 2016). Waste, according to the lean philosophy, is "everything that does not directly add value to a product based on customers' needs and requirements" (Hallam & Contreras, 2016, p. 2159) and it can be related to defects, inventory, overprocessing, waiting, motion, transportation or overproduction (Ohno, 1988, as cited by Hallam & Contreras, 2016). An uninterrupted value flow (Hallam & Contreras, 2016) and a continuous focus on customer value are critical focal points of lean philosophy (Bhasin & Burcher, 2006).

Due to their largely aligned values and aims, lean philosophy and the so called green philosophy that concentrates on reducing the negative environmental impact of an organization's products, services and operations as well as enhancing environmental efficiency while also concerning the other pillars of TBL, are increasingly discussed as complementary ideologies whose integrated use could benefit organizations in many ways (e.g. Garza-Reyes, 2015; Hallam & Contreras, 2016; Wiese, Rose, Heyns, & Pisa, 2015 and El-Sawalhi, Jaber, & Shukri, 2018). For example, Wiese et al. (2015) suggest that integrating best practices, i.e. "proven, repeatable, documented techniques that deliver measurable performance improvements" (The Hackett Group, 2006, as cited by Wiese et al., 2015, p. 3) with lean and green management practices could yield reduced waste and costs, improved efficiency as well as reputational and financial benefits and competitive advantage (FIGURE 5). Similarly, Hallam and Contreras (2016) present a network of impacts related to the lean and green integration, resulting in improved corporate performance (FIGURE 6). In their case study in the context of construction industry, El-Sawalhi et al. (2018, p. 1836) found that the integration of lean and green management approaches seemed to contribute to "waste reduction, environmental management, value maximization, health and safety improvement, performance maximization, design optimization, quality improvement, resource management, energy minimization, elimination of unnecessary process, continuous improvement and cost reduction".
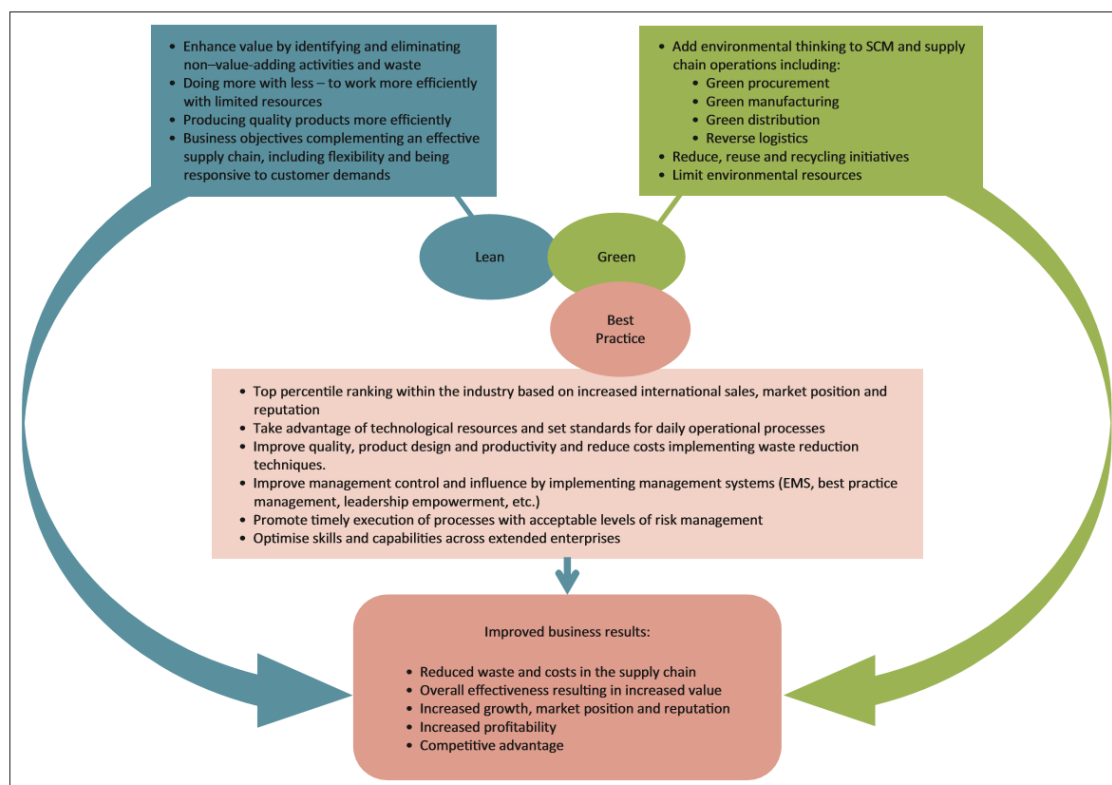
FIGURE 5 Summarized lean, green and best practice concepts and the yielded benefits from the integrated management approach (Wiese et al., 2015, p. 4).
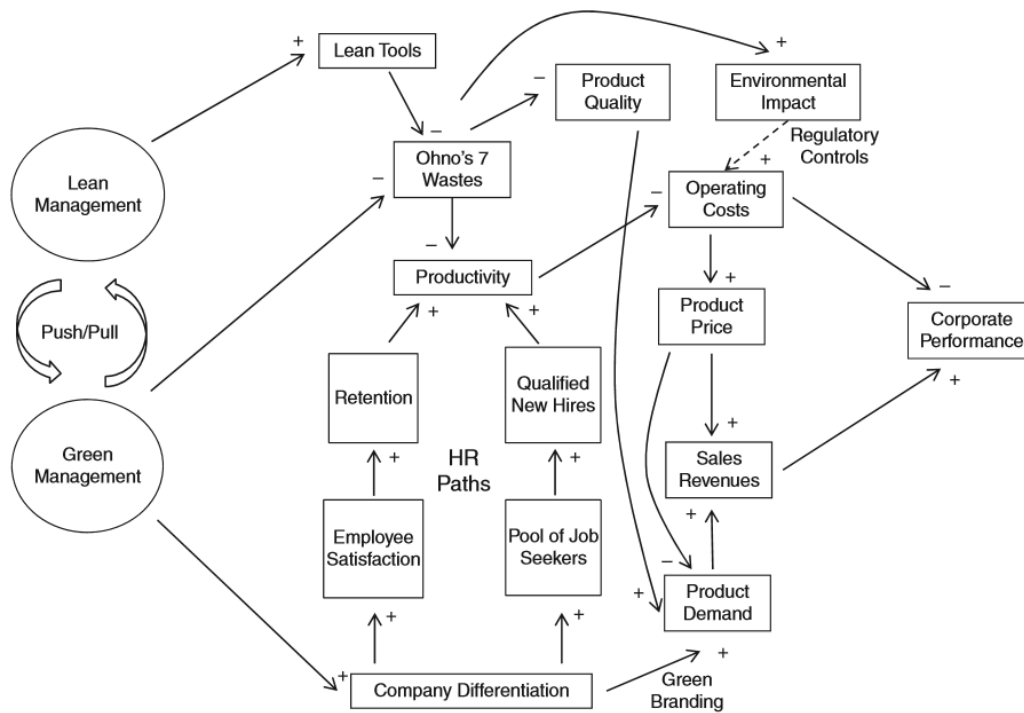
FIGURE 6 The proposed network of impacts resulting from the integrated lean and green management approaches (Hallam & Contreras, 2016, p. 2176). The plus and minus signs illustrate the direction of effect between the antecedent and the variable (Hallam & Contreras, 2016). For example, increased product prices have a negative impact on product demand.

3.5.3 Lean leadership and management principles

Bhasin and Burcher (2006) suggest that to overcome the difficulties that organizations may have regarding the adoption of and benefitting from lean, lean should be seen first and foremost as a philosophy, after which it is possible to apply tactics and tools to fully implement it. Liker (2004, as cited by Clark, Silvester & Knowles, 2013) introduces 14 principles that form the basis for lean leadership and management (TABLE 4).

TABLE 4 The 14 principles that form the basis of the Toyota way (Liker, 2004, as cited by Clark et al., 2013, p. 641)

	Lean leadership and management principles
1	Base your management decisions on a long-term philosophy even at the expense of short-term goals.
2	Create continuous process flow to bring problems to the surface.
3	Use 'pull' systems, i.e. synchronization (Elliot, 2001, as cited by Bhasin & Burcher, 2006) to avoid overproduction.

4	Level out workload.
5	Build a culture of stopping to fix problems, to get quality right the first time.
6	Standardised tasks are the foundation of continuous improvement and employee empowerment.
7	Use visual control so no problems are hidden.
8	Use only reliable, thoroughly tested technology that serves your people and process.
9	Grow leaders who thoroughly understand the work, live the philosophy and teach it to others.
10	Develop exceptional people and teams who follow your company's philosophy.
11	Respect your extended network of partners and suppliers by challenging them and helping them improve.
12	Go and see for yourself to thoroughly understand the situation.
13	Make decisions slowly by consensus, thoroughly considering all options, in order to implement decisions rapidly.
14	Become a learning organisation through relentless reflection and continuous improvement (kaizen).

Modig and Åhlström (2019) further construe the lean philosophy by dividing it to four levels: values, principles, methods and tools. As mentioned earlier, the key value in lean philosophy is customer focus. Lean principles, according to Modig and Åhlström (2019), can be divided into two: just-in-time and jidoka. Just-in-time encompasses the uninterrupted flow of value and everything that is required to achieve that, including e.g. rules and strategies. Jidoka, in turn, refers to the aim for transparency – the fact that everybody is constantly aware of what is going on and can react to it.

4 ENVIRONMENTAL MANAGEMENT SYSTEMS AND APPROACHES

4.1 Environmental management standards and systems (EMSs)

Regulation steers people's behaviour through expressing common values, norms and rules on how to behave as well as by determining expectations on how others will behave (Whitword & Tucker, 2012). Traditionally, the environmental regulation has encompassed command-and-control instruments, such as limits (e.g. emission rates), performance standards (e.g. the BAT principle) (Keohane & Olmstead, 2016), planning (e.g. zoning, plans and programmes), permits, notifications and registration, and overall, rules and sanctions (Kuusiniemi, Ekroos, Kumpula, & Vihervuori, 2013) and on the other hand, certain market-based instruments, such as taxation, allowance trading (Keohane & Olmstead, 2016 and Kuusiniemi et al., 2013), the internalization of external costs and the collection of fees (Kuusiniemi et al., 2013). These types of regulation have since been accompanied by more and more voluntary, market mechanism- and morality-based types of environmental regulation, such as administrative contracts, agreements and information steering (Kuusiniemi et al., 2013). A wider range of regulatory solutions has been needed to tackle the interconnected network of environmental problems and threats, as our knowledge of them has expanded (Sterner, 2003). Furthermore, the increased scrutiny on organizations and industries resulting from the stakeholders' and the public's growing awareness of environmental and societal issues has had and will likely continue to have an impact on communities, regulation and the business world (Lansbury Hall & Jeanneret, 2015).

Information steering, in the environmental context, encompasses environmental guidelines, environmental education (Sterner, 2003) as well as different forms of standardization, certification and eco-labelling (Kuusiniemi et al., 2013). One form of environmental standardization and certification are environmental management standards. Environmental management standards provide formally or otherwise widely recognized and accepted requirements that guide the establishment and maintenance of environmental management systems (Ivanova et al., 2014) (FIGURE 7). Both environmental management standards and systems will be referred to as EMSs in this study. The context will reveal which one of the concepts is in question.

An environmental management system forms a framework for an organization to systematically steer, control and improve its policies and practices so that they would support and enhance its environmental compliance, responsibility and performance (Psomas, Fotopoulos, & Kafetzopoulos, 2011 and Whitword & Tucker, 2012). The standards are, however, quite flexible, which is why their implementation and maintenance can differ (Boiral, 2011) depending on the or-

ganization and the context. EMS's can be certifiable or non-certifiable (Ronnenberg et al., 2011). The compliance of a certifiable environmental management system with the environmental management standard that it is based on is regularly assessed in external audits. When the environmental management system is found compliant with the standard, it receives a certificate (Rosenberg, 1976, as cited by Ivanova et al., 2014).

The fundamental purpose of environmental management systems is to integrate environmental concerns to the daily operations of organizations as well as to help prevent any adverse environmental impacts that the organizations contribute to (Kitazawa & Sarkis, 2000; Russo & Fouts, 1997 and Boiral, 2002, all cited by Boiral, 2007). Halme et al. (2018) present EMSs or other CSR management systems as tools that can be used in the implementation of external requirements as well as strategic goals and policies into an organization's operations to yield performance improvements (FIGURE 8). Grandori and Furnari (2009, as cited by Halme et al., 2018) state that to improve environmental performance, both structures and practices must be in place and Halme et al. (2018) continue suggesting that EMSs, in fact, incorporate both of these factors. Halme et al. (2018) suggest that for publicly listed companies, an EMS is a particularly vital factor in yielding performance improvements through CSR management. According to their findings, to set ambitious goals for CSR performance and to achieve CSR performance improvements, publicly listed companies, i.e. companies with "faceless" or less directly accountable ownership, require external pressure and an EMS.
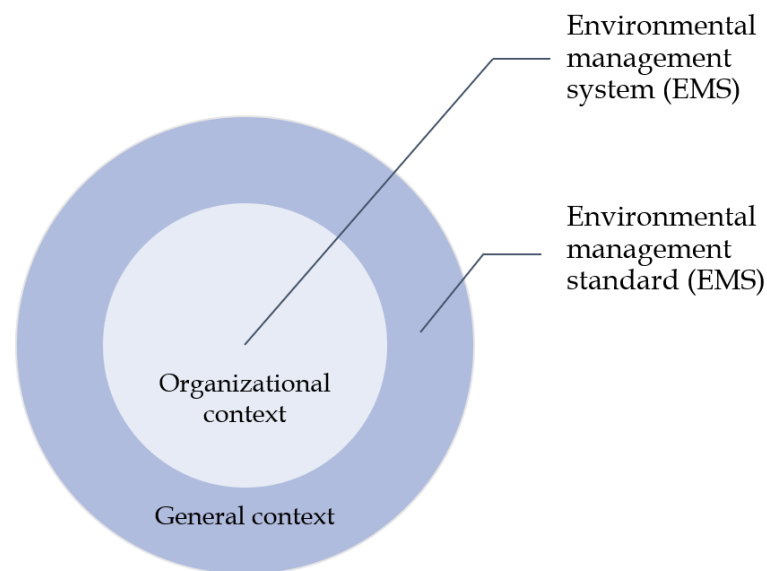
FIGURE 7 An illustration of the relationship between environmental management standards and systems. An environmental management standard provides a general framework based on which an environmental management system can be established and developed in an individual, organizational context.
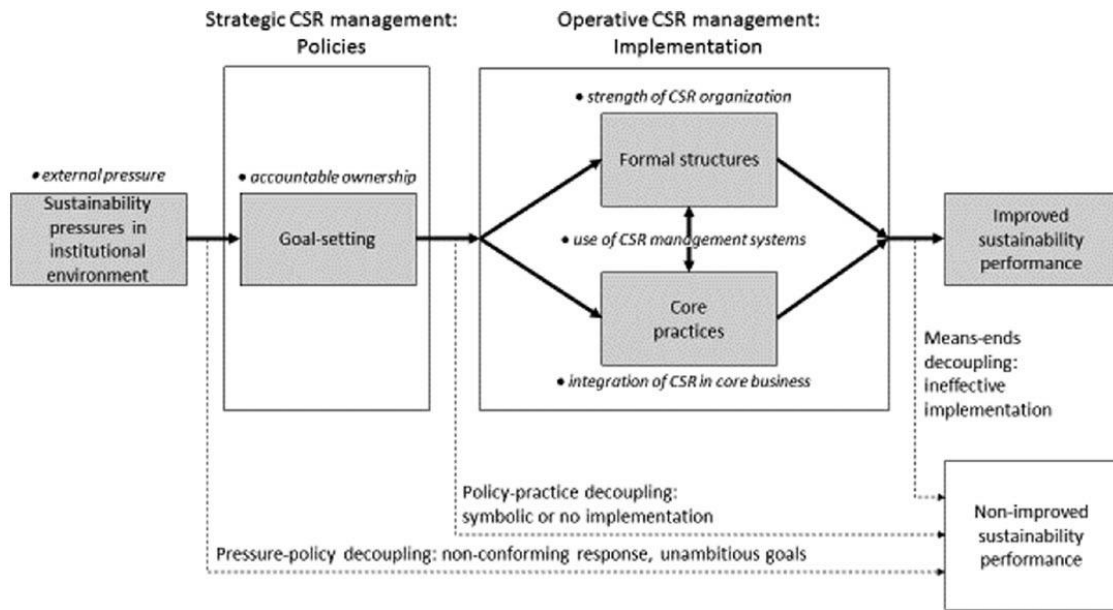
FIGURE 8 The pathway of CSR management from institutional pressures through the strategic and operational implementation phases to sustainability performance (non)improvements (Halme et al., 2018, p. 7).

4.2   ISO 14001 environmental management standard

The ISO 14001 EMS is based on the cyclical PDCA (plan-do-check-act) model (International Organization for Standardization, 2015). The standard determines framework based on which the ISO 14001 environmental management system is established, systematically maintained and continuously improved. More specifically, the ISO 14001 standard sets requirements regarding the monitoring and knowledge of the organization's internal and external context, leadership, planning of CER, support, operations, performance evaluation and continuous improvement (FIGURE 9).

When it comes to the triple-bottom-line (TBL), the viewpoint of the ISO 14001 standard is environmental. Its purpose is to contribute to the environmental pillar of sustainable development by (International Organization for Standardization, 2015) preventing and mitigating adverse environmental impacts resulting from the organization's operations; protecting the organization from possible adverse impacts caused by environmental conditions; helping the organization fulfil its compliance obligations; improving the organization's environmental performance; promoting life-cycle perspective in the design, manufacturing, distribution, consumption and disposal of the organization's products and services; contributing to possible financial and operational benefits from environmentally sound actions as well as promoting and supporting stakeholder communication.

Assumedly at least partly due to all the benefits listed in chapter 4.3, the ISO 14001 EMS has experienced growth in a wide range of industries and sectors ever since it was launched in 1996 (Boiral, 2011). Overall, the ISO standards are internationally widely recognized, in Boiral's (2011, p. 198) words, "passports for global trade". In the construction industry, the growing pressure from stakeholders, the government and the environmental agencies to reduce the industry's adverse environmental impacts has contributed to active adoption of EMSs (Pun et al., 2001 and Sakr et al., 2010, both cited by Zutshi & Creed, 2015). The increased environmental awareness within the construction sector has also likely influenced this development. Overall, according to a survey by International Organization for Standardization (2018), the construction industry seems to be an eager adopter of the ISO 14001 standard.
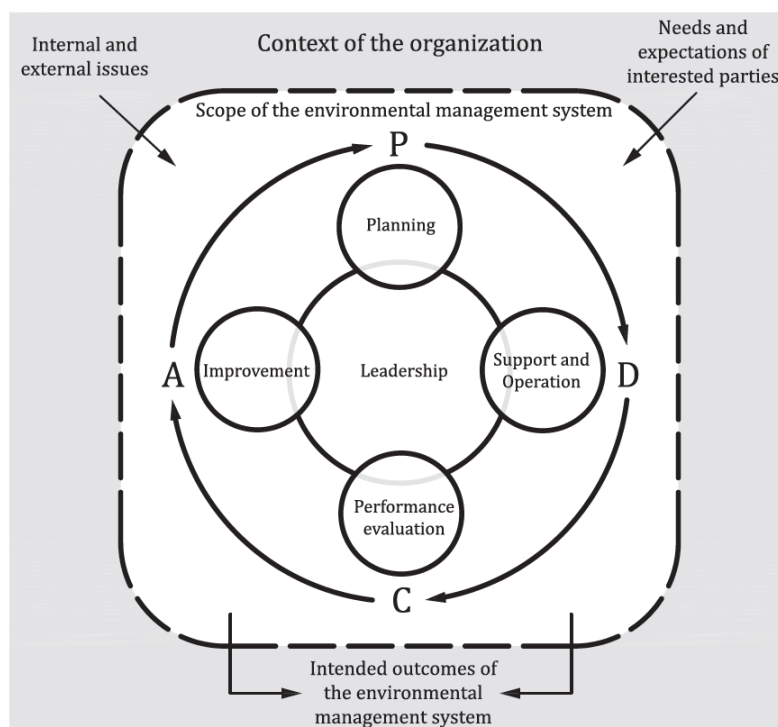
FIGURE 9 Relationship between PDCA and the ISO 14001 standard (International Organization for Standardization, 2015, p. 48)

4.3 Benefits and drawbacks related to ISO 14001 and other EMSs

According to International Organization for Standardization (2015), environmental management systems have potential to create competitive or strategic advantages through building up beneficial environmental and financial impacts. The implementation of the ISO 14001 standard has been shown to contribute to improvements and benefits including e.g. reputational benefits, financial benefits such as cost and fine reductions and savings, operational and functional benefits

such as improved operational processes and communication (West & Manta, 1996; Maxwell et al., 1997; Chandrashekar et al., 1999; Nattrass & Altmore, 1999; Zingale & Himes, 1999; Darnall et al., 2000; Hanna et al., 2000; Lee-Mortimer, 2000; Schaarsmith, 2000 and Daily & Huang, 2001, all cited by Zutshi, & Sohal, 2004) as well as managerial improvements, such as motivation, leadership, the thoroughness of environmental management practices (King et al., 2005; Gonzales-Benito & Gonzales-Benito, 2008; Russo, 2009 and Gonzalez-Benito & Gonzalez-Benito, 2005, all cited by Boiral, 2011) and environmentally sustainable supply chain management (Delmas, 2001; Melnyk et al., 2003; Corbett & Kirsch, 2001; Darnall et al., 2008 and Bansal & Hunter, 2003, all cited by Boiral, 2011). Furthermore, Delmas and Pekovic (2013) found that the adoption of an EMS seems to lead to increased training and interpersonal contacts resulting in greater labour productivity.

An environmental certification is also a way for organizations to show environmental commitment to their stakeholders, develop a responsible image (Zutshi & Sohal, 2004; Bellesi et al., 2005; Bansal & Bogner, 2002; Standards Council of Canada, 2000 and Jiang & Bansal, 2003, all cited by Boiral, 2007), enhance their social legitimacy (Hart, 1995, as cited by Whitword & Tucker, 2012), fulfil customer expectations, gain competitive advantage and to network and get internationally visible (Delmas, 2001; Melnyk et al., 2003; Corbett & Kirsch, 2001; Darnall et al., 2008 and Bansal & Hunter, 2003, all cited by Boiral, 2011). Improved reputation has been shown to have a positive contribution to employee work attitudes (Brekke & Nyborg, 2008; Hess et al., 2002 and Peterson, 2004, all cited by Delmas & Pekovic, 2013).

Besides the multiple benefits listed above, environmental management systems have also been associated with certain problems. For example the ISO 14001 EMS has been said to be rather costly (Babakri et al., 2003; Bansal & Bogner, 2002 and Bansal & Hunter, 2003, all cited by Boiral, 2011) and involve a risk of bureaucracy (Jiang & Bansal, 2003 and Boiral, 2007, both cited by Boiral, 2011) as well as excessive documentation (Boiral, 2011). Presumably at least partly due to these challenges, the different tasks related to the implementation process are sometimes externalized, which may lead to incoherence as well as insufficient integration of practices and the standard's requirements. The lack of internal commitment is also a typical problem related to the adoption of ISO 14001 (Jiang & Bansal, 2003; Bansal & Bogner, 2002; Welch et al., 2003 and Boiral, 2007, all cited by Boiral, 2011). The superficial, mechanical implementation of the standard has also been mentioned as one of the problems related to it (Boiral, 2011). Furthermore, lack of follow-up as well as lack of continuity of the system and the progress have been associated with ISO 14001 (Boiral, 2011), particularly in between audits (Boiral, 2007).

When it comes to the literature about ISO 14001, Boiral (2011) thinks that the focus lies much more heavily on the outcomes of the standard than on the implementation process of the standard and the possible challenges related to it.

According to Boiral (2011), the adoption of an EMS often has complex and contradicted outcomes, some of which can be positive and some less desirable. Overall, the findings and opinions regarding the impacts of ISO 14001 standard vary and the standard's benefits have also been questioned in the scientific literature (e.g. Boiral, 2007 as well as Christmann & Taylor, 2006; Barla, 2007; Welch et al., 2003 and King et al., 2005, all cited by Boiral, 2011).

4.4   Implementation of ISO 14001 EMS

The benefits from adopting an EMS, some of which were mentioned in chapter 4.3, cannot be taken for granted. According to Boiral's (2007) critical study regarding EMS implementation and the related benefits, the EMS implementation strategy, motives and measures largely determine whether and what kind of benefits may be yielded by adopting the EMS. There is an analogy between this idea and a phenomenon called decoupling, some types of which Halme et al. (2018) discuss in their study. In policy-practice-decoupling, the practical deployment of CSR is shallow or missing and in means-ends decoupling, the desired outcomes and the means applied to achieve those, do not match (Bromley & Powell, 2012, as cited by Halme et al., 2018) (FIGURE 8).

This chapter will present ways in which the implementation process of the ISO 14001 standard could contribute to positive outcomes related to its adoption. The structure of the implementation process of the ISO 14001 standard considered in this study is based on the theories by Ivanova et al. (2014) and Boiral (2011). The process starts by the decision of EMS adoption and continues to strategic planning, system design, deployment and finally to the follow-up phase. FIGURE 10 shows an illustration of this process by Ivanova et al. (2014) as well as the different pathways they identified for the successful implementation of an ISO standard.

From the point of view of change and lean management, Ivanova's et al. (2014) pathways theory can be contested. Especially the Information Technology Pathway seems to look at leadership and employee empowerment from a rather narrow perspective. From the viewpoint of lean management, it looks like this pathway gives a system that contributes to just-in-time but seems to neglect the jidoka principle. Ivanova et al. (2018) seem to consider that for example the lack of top management support can be compensated with choosing another pathway which, from the perspectives of change and lean management, cannot lead to successful outcomes. However, Ivanova's et al. (2014) framework can help understand the different circumstances that organizations may have in implementing EMSs. It may perhaps provide some idea of what kind of aspects to emphasize in the EMS implementation process regarding a certain set of circumstances, but based on e.g. Kotter's model and lean management, it can be concluded that it should not be followed quite as precisely as presented in FIGURE 10.
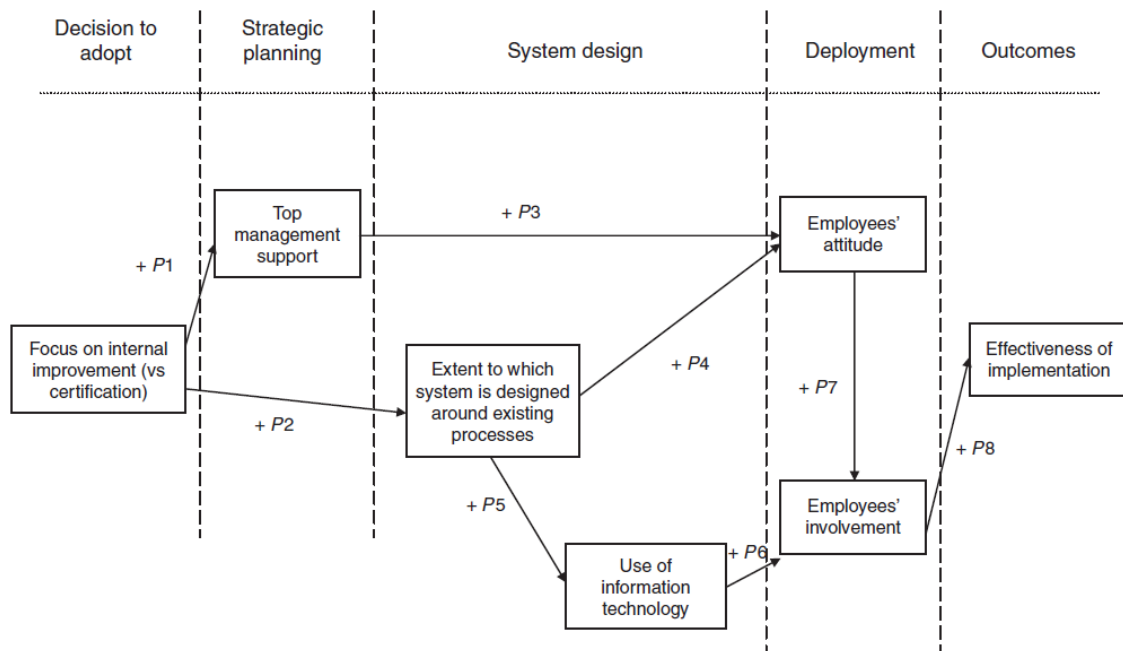
Notes: Incentives Pathway: P1 →P3→P7→P8; Integration Pathway: P2→P4→P7→P8;
Information Technology Pathway: P2→P5→P6→ P8

FIGURE 10 The implementation process of an ISO standard including pathways
for effective implementation according to Ivanova et al. (2014, p. 1289). From the
perspectives of change and lean management, this pathway cannot be used pre-
cisely as presented here but it can help understand the different circumstances that
organizations may have in implementing EMSs and based on that, provide some
idea of what kind of aspects to emphasize in the implementation process.

4.4.1 Decision to adopt an EMS and strategic planning

Companies choose to adopt EMSs for varying reasons (Ronnenberg, et al., 2011).
Examples of such are strategic, economic, ethical and symbolic reasons (Bansal &
Roth, 2000; Klassen & Whybark, 1999 and Pokinska et al., 2003, all cited by
Ronnenberg et al., 2011). That is, the organization may aim to achieve certain
benefits through the EMS implementation, such as market share, financial bene-
fits or legitimacy. The stakeholders contributing to the pressure to adopt an EMS
may include e.g. the government, pressure groups, community, customers and
employees (Zutshi & Sohal, 2004). On the other hand, the organization may also
just want to increase its internal commitment towards CER (Ronnenberg, et al.,
2011).

  According to Ronnenberg et al. (2011), the motives behind the adoption of
an EMS may affect the level of EMS implementation. Boiral (2007) illustrates this
by presenting four different degrees or strategies of EMS implementation de-
pending on how high or low the internal and institutional pressures towards the
implementation are (FIGURE 11). Similarly, Ivanova et al. (2014) classify the mo-
tivations behind the decision of ISO standard adoption as internal and external.
Top management's role in determining the ISO 14001 system integration strategy

has been found important (Terziovski et al., 1997; Yeung et al., 2003; Boiral & Roy, 2007; Jang & Lin, 2008; Lin & Jang, 2008 and Heras-Saizarbitoria, 2011, all cited by Ivanova et al., 2014). Top management support tends to be high when the motives behind the adoption of the standard are internal and lower when customer demand is the main contributor to the decision (Ivanova et al., 2014).

According to Boiral (2007), the mobilized and proactive strategies for EMS implementation (FIGURE 11) may contribute to positive outcomes, such as an increase in environmental awareness, launching of environmental programs and policies as well as setting environmental targets. However, Boiral (2007) points out that the positive outcomes did not seem to include performance improvements such as efficiency or decreased environmental impacts. The ritual and decoupled integration, according to Boiral (2007), did not appear to result in CER-related or other improvements. Castka & Prajogo (2013) agree with this view, suggesting that pressure from secondary stakeholders, that is stakeholders affected by the organization but not engaged in its transactions (Clarkson, 1995, as cited by Castka & Prajogo, 2013), contributes to the need for organizations to get certified, yet does not force the organizations to internalize the standard.

According to these remarks, it can be concluded that institutional pressure seems to be an important contributor to the decision to adopt an EMS. To achieve improvements, internal involvement is necessary. However, even high internal involvement does not directly contribute to efficiency and other operational and environmental improvements, only structural and competence-related ones. Therefore, it can be said that the mobilized and proactive strategies serve as a desirable starting point for the EMS implementation, but after that, much remains to be done to finalize internalization of the EMS. Boiral (2011) agrees with this view, stating that the first step of the implementation is a critical phase in terms of avoiding superficial implementation. To provide a basis for a comprehensive, genuine implementation process, the organization's motivations for the certification must be aligned with the organization's goals, strategies and internal needs for development.

		Low internal involvement	High internal involvement
Institutional pressure	**High**	Ritual integration	Mobilized integration
	Low	Decoupled integration	Proactive integration

<center>Low   High</center>

<center>**Internal involvement**</center>
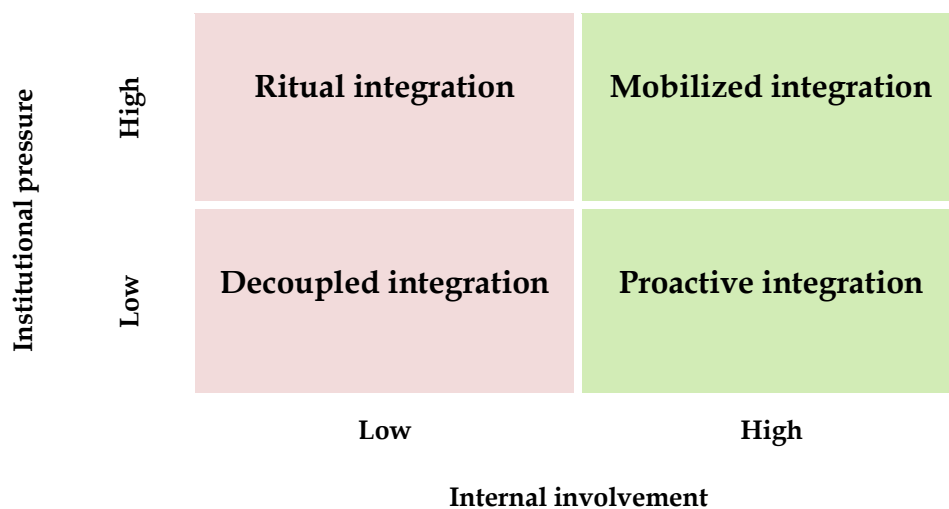
FIGURE 11 Strategies for integrating the ISO 14001 system (Boiral, 2007, p. 139). Boiral (2007) found that the strategies for EMS integration where internal involvement was high (marked with green) yielded positive outcomes that could support the beginning of the EMS implementation journey, whereas the ones where internal involvement was low (marked with red), did not contribute to the internalization of the EMS.

4.4.2 System design

The implementation of an EMS requires both technical and management measures, such as an implemented management system (Boiral, 2007 as well as Naveh & Marcus, 2004; Nair & Prajogo, 2009; Yin & Schmeidler, 2009 and Heras-Saizarbitoria, 2011, all cited by Ivanova et al., 2014). To ensure the efficiency of the implementation, Ivanova et al. (2014) recommend building the EMS around existing internal processes. Boiral (2011) considers employee engagement particularly pivotal in determining how to do embed the EMS in the existing operations and practices in the most practical manner. Furthermore, Ivanova et al. (2014) state that internal motives behind the EMS adoption contribute to the system embeddedness in the existing structures and practices.

Technological tools have also been found to support the implementation process of standards, and this potential should also be considered when designing the EMS, since it has found to have a positive impact on e.g. employee involvement (Ivanova et al., 2014). Furthermore, both Ivanova et al. (2014) and Boiral (2011) situate the beginning of the allocation of roles and responsibilities in the system design phase of the implementation. More specifically, both suggest that the decision of whether and when to use the help of consultants during the implementation process, should be made in this phase.

4.4.3 Deployment

Both Boiral (2011) and Ivanova et al. (2014) underline people's role in the practical deployment phase of the EMS. It incorporates management support and encouragement, employee empowerment (Boiral, 2011 as well as Kitazawa & Sarkis, 2000; Lin & Jang, 2008 and Heras-Saizarbitoria, 2011, all cited by Ivanova et al., 2014), reciprocal flow of development ideas, collective and inclusive decision-making (Kitazawa & Sarkis, 2000; Lin & Jang, 2008 and Heras-Saizarbitoria, 2011, all cited by Ivanova et al., 2014) as well as employee attitudes toward the EMS (Zeng et al., 2003, as cited by Ivanova et al., 2014). Top management support and prioritizing as well as the embeddedness of the EMS in the existing day-to-day practices and routines have been found to have a positive impact on the employee attitudes towards the EMS, which again furthers the internalization and realization of the standard's requirements (Ivanova et al., 2014). Boiral (2007) and International Organization for Standardization (2015) further state that for an EMS to work successfully, the responsibility of its implementation and maintenance cannot lie on a certain organizational department but must be collective.

According to Halme et al. (2018) in order to avoid superficial, ceremonial implementation of the EMS, the organization must consider CER first and foremost as performance. Policies, strategies, documentation and other CER activities taken should be understood as mere tools supporting the practical impact.

4.4.4 Follow-up

To ensure the system continuity, it needs continuous monitoring and follow-up (Boiral, 2011). During this phase, there is a risk of discontinuity and shallowness of the implementation due to ritualization (Boiral, 2007) and a mechanistic understanding of the system (Boiral, 2011). Boiral (2011) states that the regular audits and management reviews included in the EMS may mislead the organization into thinking or feeling that the EMS works on its own, fuelled by these regular check-ups. Indeed, according to Boiral (2007), the commitment toward the EMS seems to be at its highest just before audits and reviews, whereas in between the audits, the actions and dedication tend to decay. This may contribute to a loss of credibility in the eyes of the employees who, due to the ceremonial nature of the implementation, do not feel that they are genuinely involved in the process. As a solution to this, Boiral (2011) recommends regular and frequent enough audits and meetings regarding the EMS follow-up and update.

Furthermore, the improvement processes must aim at tangible changes. Alexander (2008, as cited by Viegas, Bond, Duarte Ribeiro & Selig, 2013) reminds that monitoring does not automatically lead to improvements and that in addition to detecting areas for improvements, practical measures must also be taken to realize improvement. Similarly, Morrison-Saunders and Bailey (1999, as cited by Viegas et al., 2013) state that environmental audits form a linkage between impact assessment and their management.

4.5   Special characteristics regarding environmental management of construction projects

The construction industry differs from for example manufacturing and service sectors in many ways (Zutshi & Creed, 2015). The deliverables of construction are usually custom-made and have a long life-cycle. Furthermore, the work can take place in different kinds of locations, usually at the client's site (Miozzo & Ivory, 2000 and Glass & Simmonds, 2007, both cited by Zutshi & Creed, 2015) and during different periods of time (Zutshi & Creed, 2015). These unique characteristics related to the construction industry contribute to a number of challenges regarding environmental management. These include e.g. sanctions related to the late or unsuccessful completion of projects or certain aspects of them, intrinsic environmental risks related to the industry as well as contradicting pressures related to time, cost, quality and efficiency (Christini et al., 2004; Koehn & Datta, 2003; Shen & Walker, 2001 and Zeng et al., 2003, all cited by Zutshi & Creed,

2015). Furthermore, the project coalition consists of a complex network of stakeholders (Winch, 2010). The client itself represents a wide range of stakeholders whose interests it often cannot comprehensively map out, understand or communicate to other stakeholders within the project management entity (Winch, 2010). Overall, construction projects are typically full of compromises of different parties' interests. Information transit over the life-cycle of a product, especially between the different phases from planning and decision-making to production, is also a specific challenge concerning CER management in construction industry (Arts & Faith-Ell, 2010; Varnäs et al., 2009a and Faith-Ell, 2005, all cited by Arts & Faith-Ell, 2012).

Furthermore, in the construction industry, organizational management is typically fragmented. That is, different projects are working individually, responsibilities are delegated and overall, the decision-making culture is decentralized and the operations are decoupled from the main organization (Lundin & Söderholm, 1995; Dubois & Gadde, 2002 and Engwall, 2003, all cited by Gluch & Räisänen, 2012). The operational interdependence and organizational independence (Gluch & Räisänen, 2012) result in challenges regarding information flow, (Styhre et al., 2004, as cited by Gluch & Räisänen, 2012), change management (Bresnen et al., 2005, as cited by Gluch & Räisänen, 2012), varying management practices (Labuschagne & Brent, 2005, as cited by Gluch & Räisänen, 2012) and resistance to innovation (Dubois & Gadde, 2002, as cited by Gluch & Räisänen, 2012). Construction industry is also characterized by tacit knowledge and lack of documentation (Polanyi, 1966, as cited by Zutshi & Creed, 2015) as well as temporary, changing workforce and teams (Drucker & White, 1997, as cited by Zutshi & Creed, 2015). These features can also be assumed to have a challenging impact on organizational change and environmental management, especially due to the fact that they distract information flow and knowledge transfer.

Gluch and Räisänen (2012) view the environmental management in the construction industry through Engeström's (1999, as cited by Gluch & Räisänen, 2012) activity theory, which describes the system formed by a subject and a community aiming at an object and an outcome. The activity in question is looked at from the perspective of the subject. The subject and the community, in Gluch and Räisänen's (2012) case the construction organization's environmental officials or managers and the construction project community, aim at the environmental objectives within the conditions and requirements set by the wider system formed by the environmental management tools such as an EMS, the environmental regulations and norms, as well as the project-based arrangement of the operations and management.

According to Gluch and Räisänen (2012), the most considerable challenges related to environmental management in the construction industry stem from the fact that the temporary projects and the permanent organization are managed independently, oriented to different time frames and aiming at different objectives. The projects are more short-term and product-focused while the organization aims at long-term productivity. The projects are steps on the organization's

pathway to its objectives. The environmental officials or managers stand in be-tween these very differently oriented entities within the wider system. They are accountable to the permanent organization and carry out a top-down environ-mental mission to the projects without, however, belonging to the project com-munity. Gluch and Räisänen (2012) found that the permanent organization and the project community used different forms of communication (e.g. documents and spoken communication), which prevented the environmental managers and officials from speaking the projects' language.
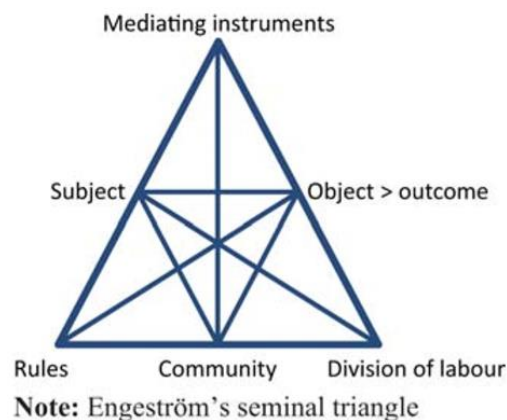
FIGURE 12 Engeström's (1999, as cited by Gluch & Räisänen, 2012, p. 129) activity theory
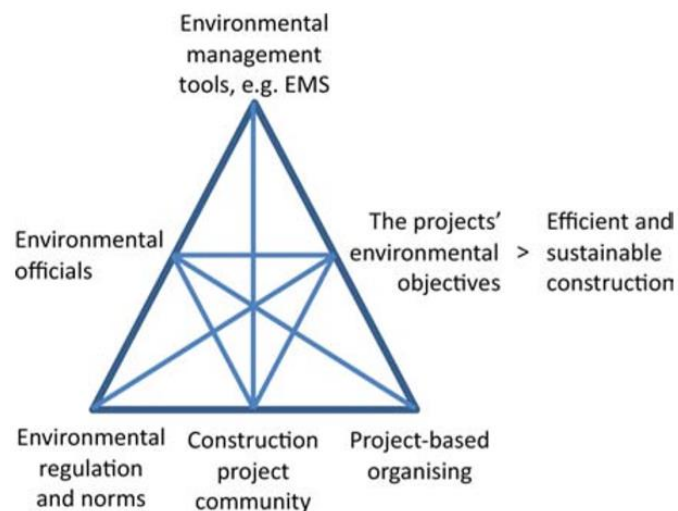
FIGURE 13 Engeström's (1999, as cited by Gluch & Räisänen, 2012, p. 129) activity theory applied to the environmental management in a construction company

4.6 New governance approaches to support the EMS project level implementation

Arts and Faith-Ell (2012) present various new governance approaches that, according to them, could contribute to solving some of the typical CER management challenges that the construction projects face. Some of these relate to collaborative relationships and partnering between the different parties involved in a construction project, some to procurement and contracting and some to managing and rating the sustainability-rated commitments of the project or the organization (Arts & Faith-Ell, 2012).

Sustainability assessment and rating tools, such as CEEQUAL, a framework specifically targeted to civil engineering, infrastructure, landscaping and public realm projects and contracts, take sustainability assessment one step further than EMSs, by providing rigorous assessment criteria related to a number of different aspects of sustainability (Building Research Establishment Ltd, n.d.a). The self-assessment based on the criteria and process described in the CEEQUAL manual is finally assessed and verified externally, after which the project and contract will receive a certificate that includes their level of sustainability performance with a scoring on a Pass – Good – Very Good – Excellent scale (Building Research Establishment Ltd, n.d.b). Because CEEQUAL requires the user to assess and weigh different sustainability aspects from a number of perspectives through all the project phases (Building Research Establishment Ltd, n.d.c), it can be understood to support balancing the pillars of TBL, including CER in decision making as well as perceiving the project as an entity including all the phases and parties. An integrated approach where EMSs and rating tools are used together has been recommended particularly for large and complex projects (Arts & Faith-Ell, 2012). Whether certified or not, the rating tools have been found to influence the project or contract, individual thinking and behaviour as well as the main organization, including its management system (Griffiths et al., 2018) (FIGURE 14).

However, there is a possibility that the use of a rating tool contributes to a simplistic way of seeing a complex situation or to the mere hunting of scores (Scanlon & Davis, 2011; Anderson, 2012; Muench et al., 2012; MacAskill & Guthrie, 2013 and Ainger & Fenner, all cited by Griffiths et al., 2018). Overall, it could be said that using a rating tool does not automatically contribute to increased sustainability (Scanlon & Davis, 2011; Anderson, 2012; Muench et al., 2012; MacAskill & Guthrie, 2013 and Ainger & Fenner, all cited by Griffiths et al., 2018), just like the adoption of an EMS does not automatically make the organization environmentally responsible.
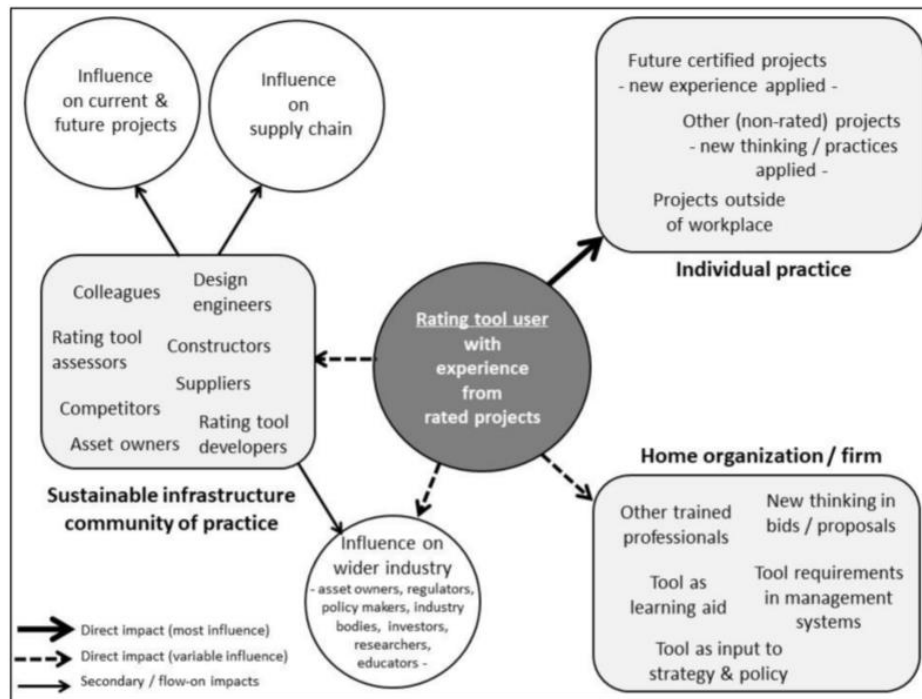
FIGURE 14 Influence of a rating tool from users to other parties (Griffiths et al., 2018, p. 11)

5 DATA AND METHODOLOGY

5.1 Research methodology

This study focuses on a specific case organization, YIT Infrastructure projects. This is principally due to the fact that the project was assigned to me by YIT Infrastructure projects and is, thus, primarily oriented to support the organization's development processes. Therefore, the nature of the study is essentially case-specific. However, a case-based methodology is also particularly suitable for this study, for the reasons discussed in the following.

The focus of the study is on finding the best ways to ensure the successful the implementation of the ISO 14001 EMS in YIT Infrastructure projects, based on the research results. Due to the case-specific focus of the study, the accuracy of the findings and conclusions is based on a thorough understanding of the studied system and its context. In this case, this understanding was best achieved through the application of qualitative research (QR) methodology, where individuals and their interactions and behaviours in natural settings play a central role (Lichtman, 2014). The reasoning in QR is rather inductive than deductive. In other words, the assumption that the specific reflects the general, and that the general can thus be interpreted from understanding the specific, plays a key role in QR.

An intensive case study aims to understand a specific case from the inside, embracing its uniqueness and explaining it in a holistic, thick and contextualized manner (Eriksson & Kovalainen, 2008). A thick description refers to the verbal interpretation of the meanings and reasons behind the details of the case (Geertz, 1973, as cited by Eriksson & Kovalainen, 2008). This thorough understanding of the case constructs "a good story worth hearing" (Dyer & Wilkins, 1991, as cited by Eriksson & Kovalainen, 2008, p. 120), through the help of which the results and conclusions of the study can be generalized to other contexts, too.

Indeed, an intensive case study does not produce information that could be generalized to other contexts in a traditional manner. Rather, a naturalistic generalization (Stake, 1995, as cited by Eriksson & Kovalainen, 2008) happens through enabling the readers to form their own interpretations of what was interesting and central in the case, based on their own thinking and experiences. This leads to the continuous formation of new insights and conclusions, since the interpretation of the study is not restricted to the researcher's conclusions but in fact, continues every time someone reads and interprets the 'story' again.

This unconventional basis for scientific generalization has been one of the arguments used against case study research (Yin, 1994 and Weick, 1969, both cited by Dubois & Gadde, 2002). However, the method has become increasingly common in many scientific disciplines as the value of understanding the interaction between a specific phenomenon and its context and learning from the details

of a particular case has been realized. Case study research has thus been seen as a particularly suitable way of studying complex issues and presenting them in an easily accessible, practical and vivid manner (Eriksson & Kovalainen, 2008).

Another type of criticism towards case study research relates to the risk of shallow, sloppy or biased analysis and conclusions that is present when conducting a case study (Yin, 1994; Easton, 1995 and Weick, 1979, all cited by Dubois & Gadde, 2002). Certainly, case study research relies completely on analytical inference (Dubois & Gadde, 2002). This can involve difficulties in matching the reality with theory. To tackle this problem, the sampling and data analysis must be intertwined (Brito, 1997, as cited by Dubois & Gadde, 2002). Another challenge in case research is being selective, i.e. finding and describing the most pivotal details in the case (Weick, 1979, as cited by Dubois & Gadde, 2002), thereby providing the 'story worth telling' that the reader can truly learn from.

The logical coherence of a case study does not derive from testing the found patterns but is rather ensured by the adequacy of the research process itself as well as the relationship between empirical data and theory (Strauss & Corbin, 1990, as cited by Dubois & Gadde, 2002). The reader's ability to trust and evaluate the accuracy of the findings and conclusions is thus ensured by providing the information necessary to demonstrate the logical coherence of the study (Eisenhardt, 1989, as cited by Dubois & Gadde, 2002).

All the three challenges described above are confronted by systematic combining (FIGURE 15), the non-linear, evolving interplay of theory, the case, the empirical world and the framework (Dubois & Gadde, 2002). Consequently, the reasoning in this study can be described as abductive, i.e. the analysis is guided by both theory and the data (Tuomi & Sarajärvi, 2018). The constantly refining understanding and thinking of the researcher supports the adequacy of the study (Dubois & Gadde, 2002).

5.1   Data collection

In a case study, the choice of methods is rather free and unlimited (Eriksson & Kovalainen, 2008). During a case study research process, a diverse set of data from various sources and contexts forms a comprehensive, detailed understanding of the case (Tellis, 1997, as cited by Eriksson & Kovalainen, 2008). In fact, according to Alasuutari (2000, as cited by Eriksson & Kovalainen, 2008) the accuracy of a case study largely depends on the richness and diversity of the data.

QR is characterized by the researcher's critical role in the research process (Lichtman, 2014). The researcher chooses the questions the study will provide answers to (Stake, 1995, as cited by Eriksson & Kovalainen, 2008), decides what kind of methods and data to use, interprets and makes sense of the data (Lichtman, 2014) and makes the outcomes of the study visible (Denzin & Lincoln, 2011, as cited by Lichtman, 2014). Thus, in QR, the researcher's role is not, and should

not be, objective. Rather, the researcher plays a subjective role and is aware of and reflective about it (Lichtman, 2014).

In a case study, the researcher also determines the boundaries of the case (Eriksson & Kovalainen, 2008) thereby creating the very definition of the case in question. Hair et al. (2015) point out that collecting information about the studied case and formulating a holistic picture of the situation requires the examination of real-life settings and interactions, which could take many months or even years to complete. This study is not an exception: I worked in the studied organization before and during the research project, which gave me a great opportunity to observe the system from the inside, in a natural context.

Interviews, particularly open-ended ones, are typically used as the primary source of empirical data in case studies (Eriksson & Kovalainen, 2008). Other data sources used in case study research, often as complementary to interviews, are e.g. observation, stories and diaries, surveys, documents, media texts, web pages and various types of visual data. In this study, interviews, discussions, focus group interviews, workshops and observation play the key role. This primary data has been collected using snowball sampling. In this data collection method, the researcher first finds a key person who gives suggestions on who could provide important information for the research. After that, the researcher is introduced to new people by the people she discusses with (Tuomi & Sarajärvi, 2018).

In qualitative research, the size of the sample plays a less significant role than in quantitative research. This is because qualitative research does not aim at statistical generalization, rather, it seeks to understand, interpret and describe a phenomenon or a case in a theoretically sound manner (Tuomi & Sarajärvi, 2018). Alasuutari (2012) points out that a qualitative dataset should be so rich that it can be analysed further and further. They note that it is, in fact, often utilized only partially. It is important to notice that this sufficiency actually derives from the richness of the dataset, not the size of it. The diversity and sufficiency of the data in this study has been ensured by selecting participants from all the different countries, organizational levels, positions and roles considered necessary for answering the research question in the scope of YIT Infrastructure projects.

Constantly observing and experiencing the system from the inside has played a pivotal role in the continuous refinement of my thinking and reasoning. It represents the 'empirical world' in the systematic combining interplay presented in FIGURE 15 and has, along with theory, guided both the data collection process and the analysis by supporting the necessary criticism towards the process itself and the findings as well as by providing completely new ideas and suggesting new connections between the findings.

5.1.1 Interviews

Interviews provide the insider perspectives and contribute to generating the rich data that an intensive case study calls for. In addition to providing information through verbal expression, face-to-face interviews also open another viewpoint

to the situation through the possibility to interpret the interviewee and the context though using visual aids (Hair et al., 2015).

Four different types of interviews were conducted during this research project: one-to-one interviews, casual interview-like discussions and focus group interviews. These interview methods were chosen based on their informative nature but also due to their practicality. For example, I got a great opportunity to join the organization's own workshop events as a facilitator and discuss with a lot of people who had gathered together. Joining the organization's own events also meant that the situation was natural. As mentioned before, conducting the research in a natural context is one of the central qualities of QR. The interview questions were open-ended and neutral and the emphasis was largely on the interviewees. The aim of all the interviews was to hear the interviewees' genuine, non-biased insights of the discussed matters.

Three one-to-one, semi-structured interviews were conducted with strategy, development and sustainability experts at the Group level (TABLE 5) between 9/2019 and 10/2019. The interviews took place at YIT Group Head Office and their duration was approximately an hour. A semi-structured interview follows a preprepared outline of topics and themes, but posing additional, spontaneous questions is also allowed (Eriksson & Kovalainen, 2008). The order of the questions can also be altered. In this study, the interview structure was designed to support the emergence of the interviewees' own insights: While the course of the discussion was slightly different between the interviews, I aimed at a structure where the least leading questions were asked first whereas the slightly more specific questions were discussed last. The interview structure used in this study is presented in APPENDIX 1.

In my view, the semi-structured interviewing method was particularly suitable for this study, since it ensures the free course of discussion while still systematically bringing up certain topics and themes to think and talk about. To get a comprehensive and functional answer to the research problem, it was important to hear all the interviewees' insights on certain themes. The semi-structured interviewing method also enabled the development and deepening of the conversations based on my growing understanding of the studied case and the theory related to it.

TABLE 5 One-to-one interviews

Interview	Interviewee
1	Senior Manager, Process Development
2	VP, Strategy and executive support
3	Head of Sustainability

Another way to collect data in this study was a method called focus group research. A focus group, according to Powell and Single (1996, as cited by Eriksson

& Kovalainen, 2008), is a selected group of individuals that has been assembled by the researcher to discuss the research topic, based on their own experience. The focus group method also follows the principles of the semi-structured interviewing method (Hair et al., 2015). The moderator encourages the participants to express their thoughts in their own words (Hair et al., 2015) and to interact with each other (Puchta & Potter, 2004, as cited by Eriksson & Kovalainen, 2008). In fact, in addition to the viewpoints, beliefs and experiences, the focus group research particularly seeks to find out and examine the spontaneous interactions between the participants (Edmunds, 2000, as cited by Eriksson & Kovalainen, 2008).

Three of the focus groups took place at construction site offices, one at the YIT Group Head Office, one at a project head office and two at segment management team meetings. Again, the aim was to conduct the meetings in a natural context for the interviewees. The focus groups took place between 8/2019 and 11/2019. The duration of the focus group meetings varied between approximately an hour to two hours. The interview method in all of the focus groups was somewhere between semi-structured, i.e. partly structured and unstructured, i.e. an interviewing method without a preprepared structure (Hair et al., 2015). This depended on the meeting schedule, occasion and the interviewees' interests. Because a significant interest in focus group research lies on the group dynamics and the formation of viewpoints (Kitzinger & Barbour, 1999 and Puchta & Potter, 2004, both cited by Eriksson & Kovalainen, 2008), and not only on the topics discussed, letting the interview take shape rather freely was, in my opinion, justifiable.

Two of the focus groups were conducted in the form of workshops where the participants were able to write their thoughts on Post-it Notes and formulate a mind map around the existing materials that I had prepared. The rest of the focus groups were conducted more conventionally, as semi-structured interview discussions. All of the focus groups consisted of participants with different kinds of roles and expertise (TABLE 6). In some of them, most of the participants worked at a construction site, on the operational level and in some of them, the participants were more administration-oriented. The purpose of assembling many different kinds of focus groups was to contribute to the generation of data rich in both verbal expression as well as feelings and atmospheres.

Focus group research was considered an especially suitable data collection method for this study due to the fact that it was able to provide the kind of multifaceted, rich information that finding answers and solutions to the complex research problem required. It also supported the formulation of the thorough understanding of the studied case that an intensive case study calls for. What was perhaps the greatest thing about using this method was, however, that the meetings also functioned as a way to enhance transparency within the organization and understanding between the different roles and organizational levels. Indeed, focus groups have been used to empower participants and to initiate change

through understanding the world through their eyes (e.g. Reinharz, 1992; Schensul et al., 1999 and Krueger & Casey, 2000, all cited by Eriksson & Kovalainen, 2008).

Both the one-to-one interviews and the focus groups, all except the workshops, were voice recorded using the company smart phone, after which these recordings were transcribed and deleted. The recording enabled me to fully concentrate on the discussion and the interactions taking place between the interviewees. Voice recording the interviews also meant that all the verbal data was recorded as a whole and none of the important details would be missed. The workshops were recorded on Post-it Notes.

TABLE 6 Focus groups

Focus group	Interviewees	Segment - **Divisions**
1	Site Manager Site Engineer Development Manager	Infrastructure projects - Rock and special engineering
2	Site Engineer, Environment SVP, Traffic Infrastructure Green Growth Director Site Engineer Project Engineer Communication Specialist Quality Engineer	Infrastructure projects - Traffic infrastructure
3	Site Engineer Site Manager Quality Engineer Site Engineer, Environment Site Manager Site Manager, Maintenance Site Manager, Maintenance	Infrastructure projects - Traffic infrastructure
4	Development Manager Development Manager Project Engineer Project Engineer	Infrastructure projects - Rock and special engineering - Traffic infrastructure - Industrial and structural engineering
5	Project VP Project Manager Project Manager Project Engineer	Infrastructure projects - Industrial and structural engineering
Workshop	**Participants**	**Segment**

		- **Divisions**
1	Segment Management Team Head of Project Support Head of Operative and Competence Development	Infrastructure projects - Rock and special engineering - Traffic infrastructure - Industrial and structural engineering
2	Segment Management Team Heads of Countries and Units in Finland Segment Management System Team	Infrastructure projects - Rock and special engineering - Traffic infrastructure - Industrial and structural engineering

While working in the case organization, I attended several meetings and discussions that cannot be considered interviews in the same sense as the previously mentioned, semi-structured interviews. These meetings took place between 9/2019 and 11/2019. Some of these meetings were planned, some spontaneous. These meetings did not have a specific structure and their duration varied between approximately a few minutes to an hour. According to Lichtman (2014) these kinds of casual or unplanned interviews are particularly typical for case and ethnographic studies which involve the researcher experiencing the studied case in field settings.

The meetings I chose to use as data sources in this study cover only a certain share of all the meetings and events I have attended while working in the case organization. The reason why I have chosen to use the very meetings listed in TABLE 7 as data sources is that they provided such key insights that I considered pivotal in answering the research questions. Overall, the information received in these meetings was crucial in constructing the big picture of the case. Some of the people I discussed with were from YIT Paving segment. Although this study specifically concentrates on the YIT Infrastructure projects segment, these discussions gave important insights and ideas for the study, due to the expertise and the all-round experience of these people. Due to their often spontaneous nature, the meetings were recorded in the form of notes instead of voice recording.

TABLE 7 Meetings

Meeting	Interviewees	Organization	Segment
1	Environment Manager	YIT	Paving
2	Environment Manager, YIT EHSQ competence expert	YIT External	Paving External
3	Quality coordinator	YIT	Infrastructure projects
4	Construction worker	YIT	Infrastructure projects
5	Construction worker	YIT	Infrastructure projects

	Construction worker		
6	Site Manager	Subcontractor	Subcontractor
7	Construction worker Construction worker	YIT	Infrastructure projects
8	Site Engineer, Environment Quality Engineer	YIT	Infrastructure projects
9	Development Manager Environment Manager	YIT	Infrastructure projects
10	Environment Manager Environment Manager	YIT	Infrastructure projects Paving
11	Development Manager Project Engineer	YIT	Infrastructure projects
12	Quality coordinator Project Manager	YIT	Infrastructure projects
13	Process Development Manager Master's Thesis Worker	YIT	Paving
14	Development Manager, YIT Fin-land EHSQ Manager, YIT Norway	YIT	Infrastructure projects
15	Environment Manager Environment Manager	YIT	Infrastructure projects Paving
16	Environment Manager	YIT	Paving
17	Development Manager Development Engineer	YIT	Infrastructure projects

5.1.2 Observation

What people do and what they say can often be decoupled, for example due to our limited memory and tendency to interpret situations differently, or due to social pressure (Eriksson & Kovalainen, 2008). Data collected through observation may therefore reveal certain aspects of the individual or the system, that might not emerge in the interviews, and vice versa. While the situation is experienced directly by the researcher (Stake, 2010), the interpretation of the received information does not rely entirely on some other individual's memory, perceptions or verbal expression. Observing and experiencing the system with the participants refines the researcher's understanding of the case and may even change the focus of the study (Stake, 2010). Observation as a data collection method has also been criticised due to its underlying assumption that the researcher's experience approximates the others' or that the researcher's presence would not affect or alter the system (Geertz, 1988, as cited by Stake, 2010). Certainly, caution should be exercised when drawing conclusions from observational data.

In this study, observation has played two different roles: It has been used as a complementary data collection method to the interviews, but on the other hand, it has also represented a part of the 'empirical world' in the systematic combining circle. In other words, my experience of working in the case organization before and during the study has provided an empirical platform with which I have been able to reflect and critically compare the findings from this study. In the following, I will explain how observation has been used in this study as a data collection method.

To contest, support and diversify the interview data, I decided to use some of the observational data I had collected in several different kinds of meetings and events while working in the case organization. In these occasions, I acted as a participant observer, i.e. experienced the situation together with the observed individuals (Eriksson & Kovalainen, 2008 and Stake, 2010). Some of the people were aware of being observed, whereas some were not. This was due to the fact that some of the data was collected during the time before I started my Master's Thesis work at YIT Infrastructure projects. All of the participants have, however, been aware of me being involved in the situation as a part of the group, and I have introduced myself to all of them.

The observation has taken place in natural settings, in a non-structured manner. The observed occasions I chose to use as data sources in this study (listed in TABLE 8) provided information that I considered important in constructing a profound understanding of the case and answering the research questions. The observations were made between 6/2019 and 12/2019 and recorded by taking notes.

TABLE 8 Observation

Observation	Occasion
1	Latvia, Management System review meeting, YIT Infrastructure projects
2	Lithuania, Management System review meeting, YIT Infrastructure projects
3	Estonia, Management System meeting, YIT Infrastructure projects
4	EHSQ meeting, Finland, Estonia, Latvia, Lithuania, Sweden, Norway, YIT Infrastructure projects
5	Internal audit, YIT Infrastructure projects
6	Internal audit, YIT Infrastructure projects
7	Internal audit, YIT Infrastructure projects
8	Management system meeting, Finland, Sweden, Latvia, Lithuania

5.2   Data analysis

The data analysis in this study was conducted through qualitative, conventional content analysis. Qualitative, in this context, means that the content of the transcribed data is described verbally, as opposed to numerical description (Tuomi & Sarajärvi, 2018). Conventional content analysis, in turn, means that no predetermined, theory-based categories are used but instead, the concepts, categories and new insights emerge from the data itself as the researcher interprets it (Kondracki & Wellman, 2002, as cited by Hsieh & Shannon, 2005). According to Hsieh and Shannon (2005), conventional content analysis is typically used when the existing literature of the phenomenon is scarce. This is true regarding the literature on the implementation of ISO management standards as described by individuals experiencing the use of these management systems (Boiral, 2011). Furthermore, the case study research method also contributed to the decision to analyse the data using the data-oriented, conventional content analysis method.

The content analysis process consisted of three phases: reduction, clustering and abstraction (Tuomi & Sarajärvi, 2018). In the reduction phase, the data was simplified by coding. In the coding process, the interesting and relevant parts of the data are marked with a simple, short codes of one or a couple of words, that describe what is important or what is happening in that specific part of the data. This process should not yet include any in depth analysis, rather, it is the researcher's interpretation, in simple words, of what the data has to say (Huberman & Miles, 1994, as cited by Bryman & Bell, 2011). The reduction process should not eliminate anything from the original data, that is relevant to the research (Hair et al., 2015).

In the next phase, clustering, the codes were combined into categories. In this phase, the researcher analyses the codes by comparing their similarities and differences (Tuomi & Sarajärvi, 2018). In this way, the categories are gradually formed. During clustering, the researcher can begin to see and understand how the codes and the categories are related to broader, more general phenomena (Bryman & Bell, 2011). The final phase of content analysis was abstraction, where the specific pieces of analysed data that are relevant to the research were connected to scientific concepts and theories (Tuomi & Sarajärvi, 2018). The abstraction process continues as long as it is possible, so that the connection to the original data still remains. Drawing conclusions is also a part of the abstraction phase.

During the analysis, I used colour codes for thoughts and comments from the segment management, Group and segment middle management, operational management and operational level. The purpose of this was to reveal, at the end of the analysis process, the possible similarities and differences between the understandings and opinions of the different organizational levels. This information would, in turn, be crucial to understand whether information and knowledge are diffused evenly throughout the organization and whether there

is a unified organizational environmental culture formed by shared values, be-
liefs, principles and behaviours.
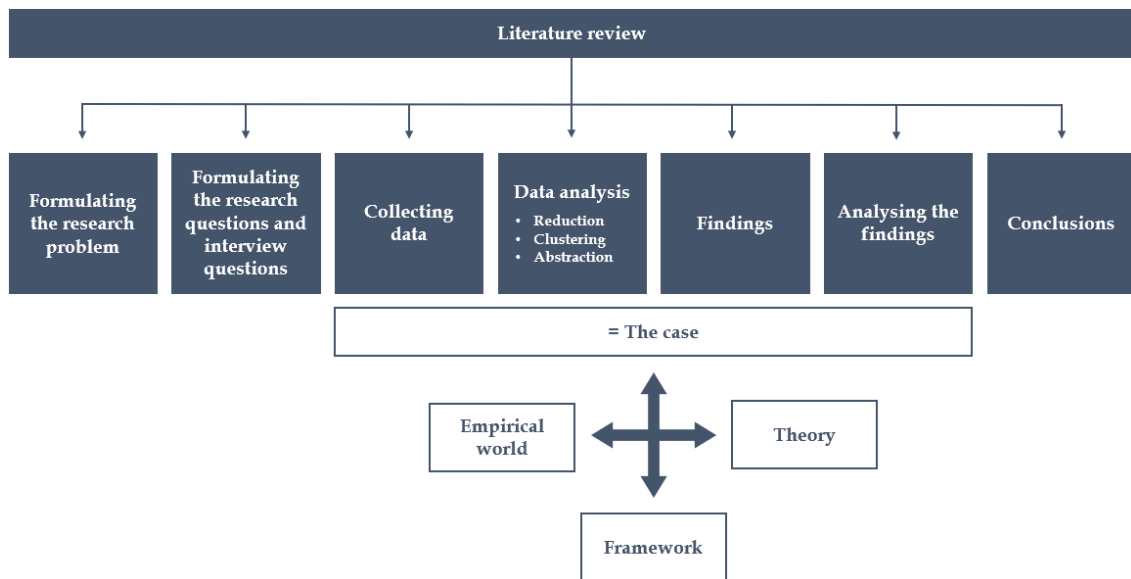
FIGURE 15 The structure of the study

6 RESULTS

6.1 Environmental management at YIT Infrastructure projects

To formulate a holistic picture of the case, it is important to understand where YIT Infrastructure projects currently stands in terms of environmental management. Therefore, I will begin this chapter by introducing the current state of environmental management at YIT Infrastructure projects, i.e. by explaining what kind of rules, principles, systems and tools are already in use.

6.1.1 YIT Group management

As mentioned in chapter 1.4, YIT Group consists of five segments: Housing Finland and CEE, Housing Russia, Business premises, Infrastructure projects and Partnership properties. In addition to the segments, the Group encompasses different support and development functions. The Group Management Team consists of the CEO, the, CFO, the EVPs of the segments as well as the EVPs of certain functions (YIT Corporation, n.d.i). YIT's management system is management by key results (MBKR) (YIT Corporation, 2018).

6.1.2 Environmental management at YIT

YIT's vision is "More life in sustainable cities" (YIT Corporation, n.d.j). It is based on the megatrends of urbanization, digitalization and sustainability (YIT Corporation, n.d.o). YIT's mission is "Creating better living environments", and the development of sustainable urban environments is the core of YIT's business model (YIT Corporation, n.d.k). YIT's strategy aims at improving profitability and maintaining financial stability (YIT Corporation, n.d.k).

YIT's strategy was recently reviewed and its three previous cornerstones: top performance, success with customers and partners as well as happy people got supplemented with a fourth one: stepping up sustainability (YIT Corporation, n.d.k). Along with that, YIT announced three long-term sustainability goals: "(1) halving CO_2 emissions of own operations and self-developed projects by 2030 compared to 2019, (2) aiming for carbon neutral use of buildings, as well as (3) starting to report project-specific CO_2 indicators of self-developed projects from 2020 onwards" (YIT Corporation, n.d.k). YIT is also committed to supporting the UN Sustainable Development Goals, the most important of which to YIT are: 11. Sustainable cities and communities, 12. Responsible consumption and production, 13. Climate action, 16. Peace, justice and strong institutions and 8. Decent work and economic growth (YIT Corporation, n.d.l). On Group level, YIT has launched a sustainability development programme called Green Growth which furthers the company productivity in line with sustainable development principles (YIT Corporation, n.d.o).

YIT aims at reduced environmental impact of its own and its subcontractors' operations as well as its customers (YIT Corporation, 2018). This is achieved through developing a sustainable living environment, reducing energy consumption, waste generation and greenhouse gas emissions, choosing the right materials, developing the business, the operations and the industry as well as investing in new innovations in the field. YIT also expects compliance with laws, regulations, environmental protection regulations as well as other ethical practices from its suppliers, subcontractors and other business partners (YIT Corporation, 2018).

Practical measures YIT has taken to support its CER include e.g. CO_2 calculations to support the development of more climate friendly solutions; the development of renewable energy services; the development of life-cycle services for buildings, renovation services and projects; the development and piloting of the use of renewable energy sources; the development of waste reporting; sustainability reporting as well as investing in the use of recycled materials (YIT Corporation, n.d.m). To support its CER commitments, YIT has adopted the ISO 14001 EMS in throughout all its operations in Finland (YIT Corporation, n.d.m).

When it comes to roles and responsibilities regarding CER management at YIT, the Group management team has the strategic responsibility and business management have the operational responsibility. In addition to these, the Urban development unit is responsible for supporting and developing business and projects in urban development-related matters, the Business development unit is responsible for the development of the operation according to the targets, the Group functions are responsible for supporting individual projects and finally, the sustainability organization is responsible for supporting projects in circular economy, supporting the business as well as collecting and coordinating sustainability-related information (YIT Corporation, n.d.n).

6.1.3 Environmental management at YIT Infrastructure projects

As a business segment, YIT Infrastructure projects' responsibility in respect of CER management is to implement development plans and to support the operations (YIT Corporation, n.d.m). According to the research data, YIT Infrastructure projects' management system is ISO 14001 certified in all of the countries in which it operates. The practical implementation of the ISO 14001 EMS in the Infrastructure projects segment has been supported through the launch of a manual specifically developed to guide the ISO 14001 implementation on construction operations (YIT Corporation, n.d.l). To support the CER efforts as well as the deployment of the ISO 14001 practical implementation manual, environmental trainings have also been organized in YIT Infrastructure projects. Some of the research data used in this study has been collected during the development and roll-out of these efforts and along with them, this study can also be seen as one of the measures taken in order to improve the implementation of the ISO 14001 EMS in Infrastructure projects.

6.2 Corporate environmental responsibility (CER) and ISO 14001 EMS as understood by the interviewees

In order to improve the implementation of the ISO 14001 EMS in YIT Infrastructure projects, I decided it would be essential to understand how corporate environmental responsibility (CER) and the environmental management system are understood in the organization. Asking the interviewees to describe their understanding of CER and the EMS would not only provide information about the interviewees' knowledge and competence regarding these matters but also reflect on what kind of motives and interests there might be behind the adoption of the EMS. This, in turn, would be a crucial piece of information supporting the construction of my own understanding of the implementation path of the EMS in YIT Infrastructure projects.

I also wanted to know what kind of environmental impacts related to YIT Group's and YIT Infrastructure projects' operations the interviewees would recognize. This information would formulate an outline of the interviewees' knowledge and awareness of what kind of environmental impacts the company and the Infrastructure projects segment contribute to. It would also give me an insight into how the interviewees understand the scope of CER. The purpose of getting to know how these concepts and environmental impacts are understood by the individuals working in the organization was to help me draw conclusions and come up with development ideas that would be relevant and useful for the studied organization.

1. Corporate environmental responsibility (CER) as understood by the interviewees

According to the understanding of the interviewees, CER consists of 6 main components (FIGURE 16): (1) it involves fulfilling stakeholder demands, (2) having other values in addition to financial ones in the core of the business, (3) taking care of the environment, (4) aiming at continuous improvement, (5) having commonly agreed management and control procedures in place and (6) being transparent. When asking the interviewees how they understood CER, a topic that kept coming up in the answers was living up to the growing stakeholder expectations and demands. According to the interviews, the most significant stakeholder groups demanding environmental responsibility from YIT Infrastructure projects are clients, regulators, investors, employees and other operators within the industry, such as competitors and suppliers. The significant contribution of the clients to the ambition of CER efforts and the environmental ambition of the organization is particularly highlighted in the data.

There seemed to be a consensus of opinion among the interviewees, that the societal pressure to operate in an environmentally sound manner is continuously growing and that organizations that do not consider this pressure can no longer succeed. Furthermore, the stakeholder and societal pressures towards a big company such as YIT were thought to be especially high because of the assumption

that a big company contributes to considerable environmental impacts and on the other hand, has sufficient resources and power to improve both its own as well as the whole industry's way of thinking and operating.

CER was also found value-sensitive in that individuals' personal values, the organization's values and the changing societal values were believed to play an important role in the development of the organization's CER. For example, the sustainable development megatrend was assumed to have an impact on the future employment processes in that the new generations might not want to invest in, work with or work for organizations with poor CER. Therefore, to ensure the existence of clients, employees and investors in the future, the interviewees found that companies would need to continuously develop their CER and have sustainability as one of their core values. Some of the interviewees' comments also suggested that they considered the environmental change as a somewhat personal question, as well, since the success of the organization would mean that there would be work to do in the future, too.

Regarding values, another important aspect of CER in the eyes of the interviewees was having other values in addition to financial ones integrated in the core of the business. This can be illustrated through two different ideas that could be found in the interviewees' answers. The first one was that CER should not be superficial, which means that everything said in any environment-related messages and promises should be demonstrated on every level of the organization, in all of its operations and in all of its decisions. Second, CER should not be something that contributes to significant costs in the long run, because this would indicate that it is not truly integrated in the business. The fact that in addition to environmental values, the interviewees associated CER with non-environmental values as well, implies that they see CER as a part of the triple bottom line (TBL) of CSR. One of the interviewees also directly described CER as an element of the TBL and as a part of the management of sustainable development. Furthermore, CER was seen as a part of the EHSQ (Environment, Health, Safety and Quality) field that is often managed as one entity.

Actively taking care of the environment was also seen as a central characteristic of CER. According to the data, this encompasses for example studying and knowing the operational environment, planning and conducting the construction project in a way that minimizes any harm to the environment and finally, restoring the environment as well as possible. Examples of practical environmental efforts mentioned by the interviewees included e.g. moving different species out of the construction area, studying and protecting the soil and water system properties at and around the area, identifying special characteristics of the environment as well as mapping out all harms the project could possibly cause to the environment and avoiding them. Based on the data, it seems that the environment was not only understood as natural environment and ecosystems but also as built environment as well as people living in or using the area.

An aspect that frequently appeared in the interviewees' descriptions of CER was the aim for continuous improvement. Indeed, the data showed that for example innovativeness and a forward-looking, proactive attitude were understood as important aspects of CER. Interestingly, however, there were also slightly differing views on the level of ambition that CER requires. Although many of the interviewees considered exceeding the regulatory demands a pivotal part of CER, some of them did not or were less certain about it. Overall, the consensus of opinion was not crystal clear when it came to this question.

CER was also seen as a part of the management and control of the organization's operations and risks. Committing to mutually agreed policies and principles as well as continuously measuring and monitoring operations were seen as important aspects of CER. A common view among the interviewees seemed to be that by operating according to the policies and principles as well as by being transparent and proactive, the organization could manage both the financial and reputational risks related to intentional or unintentional environmental irresponsibility or the failure to fulfil the stakeholders' and the society's expectations. Transparency was, in itself, also considered as an important aspect of CER.

Corporate environmental responsibility (CER) as understood by the interviewees					
Fulfilling stakeholder demands	Other values in addition to financial ones in the core of the business	Taking care of the environment	Aiming at continuous improvement	Having management and control procedures in place	Being transparent
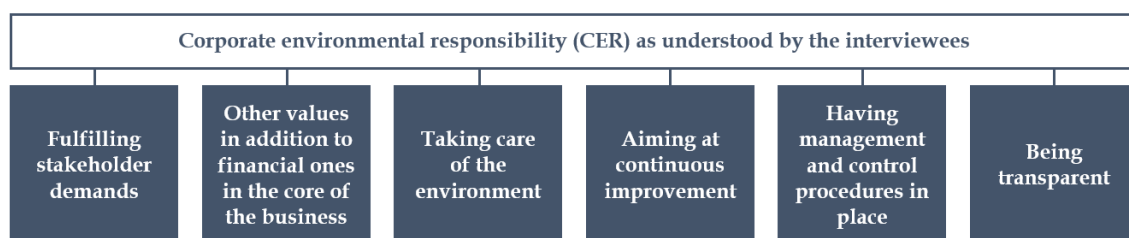
FIGURE 16 Corporate environmental responsibility (CER) as understood by the interviewees

2. ISO 14001 environmental management system as understood by the interviewees

I asked the interviewees both about how they understood the ISO 14001 EMS and what they thought were the reasons behind the adoption of it. What I was interested in finding out was what the interviewees knew about the EMS but also what kind of motives were behind the adoption of it. The differences between the individuals' knowledge about the EMS and the management system in general were considerable.

Based on the data, it could be said that the ISO 14001 EMS was most commonly understood as a development tool, a risk-management tool, a change management and follow-up tool and as a way to guarantee a certain level of environmental responsibility and continuous improvement. Regarding the latter, it was highlighted that this guarantee, the ISO 14001 certificate, is nowadays an important client demand. According to some of the interviewees, the client demands are in fact, the main motive behind adopting the EMS.

This brings us to the other motives behind the adoption of the EMS. They can be divided into two groups: external and internal motives (TABLE 9). As

mentioned, the external pressure to guarantee a certain level of CER and the continuous improvement of it was found considerable. Based on the data, it seems that the most notable external stakeholder groups contributing to this pressure are clients, investors and the society, overall. The demands from these stakeholders and the competitive environment together were believed to cause a pressure of "staying in the game". In other words, the EMS could nowadays be regarded as a necessity, a way to keep up with the continuous development and change. Some of the interviewees also saw the EMS as a competitive advantage. Employee expectations towards CER were also mentioned and could be classified as an internal motive to adopt the EMS.

Other aspects that came up in the interviews and could be understood as internal motives to adopt the EMS were internal development- and management-related aspects as well as the system's potential to increase efficiency and savings. The EMS was also understood to support regulatory compliance. Overall, the roles of the EMS as a development and management tool and as a guarantee of CER were emphasized in the discussions. Stakeholder demands, especially the ones coming from clients, seemed to be particularly highlighted in the answers.

TABLE 9 The motives behind adopting the ISO 14001 EMS according to the interviewees

External motives	Internal motives
- Fulfilling clients' demands - Fulfilling investors' demands - Competitive pressure - Reputational and societal pressures	- Development and management tool - Efficiency and savings - Ensuring sufficient human resources now and in the future - Ensuring regulatory compliance

3. *Environmental impacts identified by the interviewees*

The interviewees recognized two different types of environmental impacts related to the operation of YIT Infrastructure projects: ones regarding the whole life-cycle of the deliverables and ones regarding the construction phase of a construction project (TABLE 10). From the life-cycle-wide environmental impacts mentioned, five groups can be identified: modification of the environment and ecosystems, raw material consumption, emissions, energy consumption and societal impacts. From the construction phase-related environmental impacts, three different groups can be identified: waste generation, chemical-, oil- and fuel-related risks and damage as well as emissions and disturbances.

TABLE 10 Infrastructure projects' environmental impacts identified by the interviewees

Life-cycle-wide environmental impacts	Construction phase-related environmental impacts
- Modification of the environment and ecosystems - Raw material consumption - Emissions - Energy consumption - Societal impacts	- Waste generation - Chemical-, oil- and fuel-related risks and damage - Emissions and disturbances

6.3 SWOT analysis of the implementation of the EMS

During the analysis of the data I noticed that instead of just challenges and strengths, it also seemed to include plenty of references to opportunities and threats related to the implementation of the ISO 14001 EMS in YIT Infrastructure projects. Therefore, I decided to organize the results according to the SWOT (Strengths, Weaknesses, Opportunities, Threats) framework. I have, however, applied the framework in a slightly modified manner to make it more relevant for this study. All the SWOT elements are viewed from both internal and external perspectives as opposed to the traditional SWOT analysis, where strengths and weaknesses represent internal factors whereas opportunities and threats represent external factors. Regarding this study which concentrates on an internal implementation process of the ISO 14001 EMS, I did not see a significant benefit in handling the several internal and the few external factors that could be found in the data, separately. On the contrary, I think that in this case, viewing the strengths, weaknesses, opportunities and threats from all possible perspectives made the analysis clearer and more consistent than it would have been if I had followed the exact SWOT framework principles.

When it comes to the threats, I decided to discuss the threats posed by the possible failure to implement the EMS instead of the threats that could lead to this failure. This is because I think the weaknesses and challenges chapter already combined the current and future, internal and external challenges and threats related to the implementation of the EMS. Furthermore, in this study, the modified SWOT analysis framework has been used as a tool to simply organize the elements that, based on the research data, constitute the current state of the implementation of the EMS in YIT Infrastructure projects. The further analysis of these results in chapter 7 then presents ways to "maximize the potential of strengths and opportunities while minimizing the effects of weaknesses and threats", which according to Schmoldt and Peterson (2000, as cited by Fertel et

al., 2013, p. 1140), is the aim of SWOT analysis. The results organized according to the SWOT framework tailored for this study are presented in TABLE 11.

TABLE 11 A tailored version of SWOT analysis for the implementation of the ISO 14001 EMS in YIT Infrastructure projects

Strengths and assets supporting the implementation of the EMS	Weaknesses and challenges related to the implementation of the EMS
1. Accepting attitude towards CER 2. External pressure to improve CER 3. Management system and project management 4. Strong focus on systems development 5. Progress in environmental awareness and knowledge 6. Team spirit on operational level 7. Wide network and resources of a large company	1. Lack of environmental awareness and knowledge 2. Insufficient top-down steering and control 3. Unclear roles and responsibilities 4. Incomplete integration of CER with day-to-day practices and the employees' work identity 5. Challenging operating model 6. Fragmented organizational culture 7. Concurrent change processes 8. Operational environment 9. Information flow and update
Development ideas and opportunities related to the implementation of the EMS	**Threats in case of an unsuccessful implementation of the EMS**
1. Training and environmental expertise 2. MBKR (management by key results) to support CER 3. Internal cooperation and employee empowerment 4. CER organization and reallocation of resources 5. Environmental leadership and CER culture 6. Improving CER communication 7. Proactiveness and networking 8. Utilizing best practices from occupational safety	1. Lagging behind in development 2. Realization of financial and reputational risks 3. Giving up 4. Weakened trust and credibility 5. Weakened transparency

6.3.1 Strengths and assets supporting the implementation of the EMS

1. Accepting attitude towards CER

Based on the data, one of the principal assets supporting the successful implementation of the ISO 14001 EMS in YIT Infrastructure projects seems to be the internal willingness to improve CER. The top management's dedication and commitment towards CER can, according to some of the interviewees, be seen in the climate- and environment-related long-term targets as well as in YIT's strategy, overall. Currently, there also appears to be a strong focus on development at YIT. For example, environmental trainings have been arranged, environmental monitoring has been increased and the collection of environmental data from the sites is under active development.

According to the interview and observation data, the construction sites also show mostly positive, some even innovative and responsive attitude towards CER. This could be inferred for example from some of the interviewees' enthusiastic descriptions of what kind of environmental efforts had been taking place at the construction site. Furthermore, active learning also took place during an interview, which could be noticed from the fact that the interviewee utilized the provided information later during the interview in their own comments. Overall, the interviewees seemed to be eager to talk about CER-related matters.

According to some of the interviewees, unconcerned attitudes still come across but overall, as the remarks in chapter 6.2 suggest, it seems that the people working in the organization understand the necessity of environmental change and are able to identify the reasons behind it need very well. Furthermore, there seemed to be a rather clear consensus of opinion among the interviewees that everyone working in the organization should know, on a basic level, what kind of environmental matters must be considered in their everyday work as well as why and how they should be considered. Finally, some of the interviewees stated that there were signs of CER integration to workplace norms and daily habits. This could be inferred from an interviewee's comment according to which it was considered acceptable and "the right thing to do" to point out to a co-worker if they were not complying with what was considered a CER-norm, such as recycling.

All in all, the attitude towards CER in YIT Infrastructure projects could be seen to crystallize in the phrase "if it makes sense" which, in some form, could be heard in many of the interviewees' answers. It seemed that the interviewees were very open to change, but expecting it to somewhat align with the existing operations and common sense. Furthermore, the phrase could be seen as an expectation to receive justifications for any changes made.

2. External pressure to improve CER

Another aspect that came up in the data and can be seen as an enhancing factor for the implementation of the EMS was the high external, institutional and stakeholder pressure to constantly improve CER. This could be seen especially in the interviewees' views on why YIT Infrastructure projects should operate environmentally responsibly and why the ISO 14001 EMS has been adopted. Overall, the

increased environmental awareness and knowledge of external parties was believed to increase scrutiny towards the organization's operations and policies and thereby contribute to the organization's internal willingness and interest to improve its CER and to implement the EMS successfully. Based on the data, it seems that the stakeholders, especially clients, are increasingly interested in how the ISO 14001 standard is internalized in the organization's operations in practice. Furthermore, tightening environmental legislation and regulation has an impact on the organization's CER development.

3. Management system and project management

YIT's management system was also considered a main strength supporting the implementation of the EMS. It was understood as a contributor to systematic development, efficiency, agility and the distribution of best practices. Some of the interviewees even stated that the management system was absolutely necessary for the implementation of any changes. In Finland, project management was also regarded functional in supporting the implementation of the EMS. Regarding the management system and project management, it must be noted that their implementation is in different phases in different countries and that the Finnish situation reflects the most advanced implementation phase.

4. Strong focus on systems development

During the study, it became apparent that important improvements have recently been made in YIT Infrastructure projects, especially regarding project management, data collection and information management systems, and that the development focus on project management and support systems overall, is high.

5. Progress in environmental awareness and knowledge

When it comes to the environmental awareness and knowledge within the organization, progress can, according to some of the interviewees' statements, be seen in comparison with the past decades and even with the past few years. For example, life-cycle and large-scale thinking have gradually become more common. This could be inferred indirectly from some of the statements regarding for example the organization's or the construction sites' environmental impacts. Large-scale thinking could also be seen for example in that some of the interviewees working on the construction sites were worried about the fact that contaminated soil sometimes has to be transported for rather long distances due to the circumstances posed by the operating environment and that this, although aiming for contamination control, leads to increased traffic emissions. Some of the interviewees' statements indicated that the increased environmental awareness on construction sites has, in some cases, contributed to better transparency and cooperation, as the individuals working on the construction site have known when to ask about something or suspect some risk, for instance.

6. Team spirit on operational level

Organizational culture can also be seen as an asset from the point of view of development in that the team spirit at some of the construction sites and within some projects seemed to be strong. The team spirit could be seen for example in certain comments indicating that together, the project aspired to do better than other projects or competitors. The team spirit could also be observed in the teams' internal communication and dynamics, for example jokes and compliments given to team members.

7. Wide network and resources of a large company

According to the data, there seemed to be a somewhat prevailing understanding within the organization, according to which as a large company with a wide network, YIT has potential to influence the whole industry's environmental responsibility. The interviewees also seemed to believe in YIT's possibility and power to influence environmental matters on a societal scale as well, through active networking. On the other hand, the data also revealed a thought according to which YIT has a great possibility to learn from its wide network, for example from its subcontractors, and utilize the learnings in its development. YIT's possibility as a large company to use resources for development was also found an asset regarding the development of CER.

6.3.2 Weaknesses and challenges related to the implementation of the EMS

1. Lack of environmental awareness and knowledge

The results suggest that although there has been improvement in environmental awareness and knowledge in YIT Infrastructure projects, there is still room for improvement. There seems to be a decoupling between the eagerness to improve CER and the ability to do so. According to an interviewee, environmental knowledge is still lacking within the industry and the company and therefore also in the Infrastructure projects organization and on the operative level. Based on the data it looks like there is considerable variation in environmental awareness and knowledge within the organization.

According to some of the interviewees, the exact definition of CER for YIT in a long-term perspective still seems to be under deliberation. The understanding of how CER becomes apparent on a practical level also appears to be incomplete. In one of the interviewees' words, to enable successful CER development and EMS implementation, the top management must specifically identify all the factors that contribute to these. The interviewee demonstrated this with a simple example of preparing for a winning sports performance: In order to succeed, one needs to know that training, eating and rest are the factors affecting their performance and that therefore, all of these factors must be considered while preparing for the event. In case one does not recognize all of these factors or concentrates on completely different factors, it can be difficult to succeed. In addition to identifying the factors contributing to the success of CER and the implementation of

the EMS, it was believed that the top management should more clearly and practically determine what the achievement of the environmental targets means for each organizational level and role. The long-term profitability of CER was also a topic that was found to be lacking in-depth understanding on the top management level.

When it comes to the state of environmental awareness and knowledge within the organization overall, life-cycle and large-scale thinking still seem to be somewhat lacking, regardless of the good examples given in the previous chapter. This was directly stated by some of the interviewees but can also be inferred from the data. For example, when asking the interviewees to define CER in the company's context as well as in a wider societal context, the presence or absence of large-scale thinking became apparent in the answers. Furthermore, it appeared that there is still room to improve regarding the extension of life-cycle thinking to project management. That is, in addition to the construction phase, CER should be increasingly considered and emphasized in the production planning phase.

According to the interviewees, there are still gaps even in the basic environmental knowledge within the organization. Furthermore, there seemed to be a lack of awareness and knowledge regarding some of the systems used. According to some interviewees, the knowledge about the management system, overall, is low. Some interviewees also admitted that the facelessness of some of the systems sometimes contributed to frustration in situations where quick answers and support was needed.

2. Insufficient top-down steering and control

Based on the data, it seems that the use of the MBKR (management by key results) system has not yet achieved its full potential in steering and implementing CER. The situation seems to be similar regarding the monitoring and measuring the environmental performance in YIT Infrastructure projects on the whole. Based on the research data, it appears that the follow-up relies rather heavily on audits due to the fact that the management of the more day-to-day environmental monitoring still lacks consistency. Consequently, the operational management's and the employees' personal interest and ambition concerning the daily and weekly environmental efforts and monitoring is emphasized. Data collection from the sites is currently under active development and certain improvements have been achieved. However, based on the interviewees' comments, it looks like the analysis and utilization of the data as well as the management based on it still need to be improved.

According to the data, the environmental management in YIT Infrastructure projects seems to remain on a rather general or abstract level while there still appears to be room for improvement concerning practical support mechanisms and instructions. In other words, the practical deployment phase of different development processes tends to be inadequate. In one of the interviewees' words, even if something is required, the obligation does not get fulfilled unless the full implementation process of the requirement, especially the practical deployment

phase, is carefully managed. There have, however been improvements regarding this challenge. For example, the launch of the ISO 14001 manual can be seen as such. Another challenge that came up in the interviews regarding management was the insufficient prioritizing of different development processes and topics. The information overload caused by this may, according to the interviewees, causes problems in the internalization of important information.

3. Unclear roles and responsibilities

Based on the data, it seems that CSR- and CER-related tasks and responsibilities are scattered within the YIT Infrastructure projects organization and that there is also room to improve regarding the internal coordination and cooperation related to CER. Overall, it seems that the implementation network for the CER-related matters could be more coherent, interconnected and streamlined. According to some of the comments from the interviewees', the unclarity of roles, responsibilities and the ownership of the CER-related questions has contributed to inefficiency especially in information flow.

4. Incomplete integration of CER with day-to-day practices and the employees' work identity

The data revealed that CER might not yet be seen as an inseparable part of the business or the day-to-day work in YIT Infrastructure projects. In fact, it seemed to be regarded as a separate entity and was even directly referred to as such. In other words, in their comments, many of the interviewees tended to consider environmental work separate from their own role. Environmental work was sometimes seen to slow down or disrupt the other tasks that the interviewees identified with more closely.

Deficiencies in the use of different kinds of documents as well as by the reluctant attitude towards the use of them also indicated challenges in the integration of the EMS into the day-to-day practices on the project and site levels. The use of documents was found difficult and resource-consuming by many of the interviewees. Importantly, these remarks did not seem to go hand in hand with generally reluctant attitudes toward CER. In other words, the interviewees could often find the CER-related work as a separate, even disrupting extra responsibility while at the same time showing willingness to improve CER and protect the environment.

Finally, based on this study, it also seemed that the idea and especially the potential benefits of audits were not fully understood in the organization. According to some of the interviewees from the operational level, audits were seen as something that produces a list of extra work to do rather than as for example something that can increase the efficiency of the work or competence of the employees.

5. Challenging operating model

YITs operating model also seems to pose certain challenges to the implementation of the EMS and the management of CER as a whole. First, the company's structure is segmented in multiple ways. According to the data, the segments manage their own divisions, units and projects highly independently. The segment-centred management leads to the need for internal cooperation and harmonization of instructions, practices and development processes. On the whole, the segmented organizational structure creates many layers of separate organizations and interfaces. The different countries Infrastructure projects segment operates in also constitute their own, local organizations that are affected by local cultures, regulation, guidelines and other circumstances. The countries stand in different phases in terms of development as well as the implementation of changes and the management system.

Second, the different types of organizations (segments, functions, divisions, units, projects and construction sites) working within the Group differ from each other greatly, for example due to their size or the types of projects they are conducting. These factors affect for example the amount and type of resources these sub-organizations are able to use. These issues came up in the interviews but could also be observed while visiting and observing different construction sites. Third, subcontracting appears to be common in YIT's operation and in construction industry, overall. This brings even more parties and interfaces into the mosaic of organizations that operate together to create value. The interviewees found that there is considerable variation in how the cooperation with the subcontractors works out. Aligning the policies and cultures of different organizations, overcoming language and culture barriers as well as communicating and supervising the operations of multiple operators were considered the most usual challenges concerning the cooperation with subcontractors.

Finally, the fact that the business is managed and conducted in the form of projects was found challenging in terms of implementing changes and developing operations. This was justified by saying that the different projects formulate numerous sub-organizations and interfaces that have to be penetrated in order to for example communicate and share information effectively. Furthermore, the fact that the projects only last for a certain time seemed to contribute to a worry regarding the continuation of development. In addition to this, the fact that the projects are of different sizes and types, are located in different areas and have different amounts and types of resources was understood as a challenge in terms of CER management.

6. Fragmented organizational culture

The data revealed that the organizational culture appears to pose certain challenges to management and development. According to an interviewee, YIT is currently working through an organizing phase following the merger with Lemminkäinen that took place in 2018. Indeed, this was shown both in the interviewees' comments and in the company's operations. An "us versus them"-attitude

was still visible in the interviews and the observation data, that is, the identification with the old organizations' cultures still seemed to be strong. When it comes to the company's management and operations, the renewal and rearrangement of them still seems to be partly ongoing. The organizational culture also seemed to be fragmented due to the organizational structure that is divided into different levels and sub-organizations, such as segments, functions, divisions, units, projects, teams and construction sites. All in all, according to the data, it seems that the mosaic-like organizational structure has contributed to segmented organizational culture, as well.

Some of the interviewees admitted that they did not exactly know what is involved in the roles, responsibilities and everyday work of the employees or managers working within another organizational fragment. In some comments, there seemed to be also implications of a lack of trust and understanding between different organizational levels. Especially when it came to relationship between the main organization and the project level, these "organizations" seemed to feel isolated. It seemed that especially the people working on the project level tended to feel that the main organization does not always understand the reality and culture on the operational, practical level. For example visits from the main organization to the construction sites were seen in very different ways. On one hand, the site visits were understood as opportunities to ask questions, learn, network, give feedback and present the project and the practices. They were also seen as a sign of care and interest towards the operational level. On the other hand, some interviewees stated that some people still perceive site visits as distractions from construction work. Overall, however, site visits seemed to be a desired practice and were perceived as a more efficient and trust-building way to train and communicate than more faceless or written ways of communication.

7. Concurrent change processes

There seems to be a number of overlapping change processes ongoing in the company, fuelled by powerful megatrends such as digitalization, urbanization and sustainable development as well as the still rather recent merger between YIT and Lemminkäinen. This can be seen as a challenge when viewing the situation from the perspective of just one of these change processes.

8. Operational environment

The circumstances posed by the operational environment also seem to have a complicating impact on YIT Infrastructure projects' CER. First, the environmental aspects and impacts appear to depend on the type of construction project as well as the characteristics of its surroundings. According to the data, because the operations of YIT Infrastructure projects take place in a large variety of different places, the identification and anticipation of possible environmental risks and reactions can be challenging. Through decision-making, the national and local environmental authorities as well as the client were also regarded to have an influence on CER on the operational level. Circumstances highly dependent on local

conditions and decision-making, such as the location of landfills and the possibilities to circulate materials and masses were also explained to have a considerable impact on the project level CER.

9. *Information flow and update*

Based on the interviews, it seems that the main challenges regarding communication and information flow concern the complex operating model, the unclear roles and responsibilities, the rapid pace of development and change, the lack of prioritising, the lack of awareness and competence in environmental matters as well as the lack of communications management. When it comes to the operating model, the mosaic-like organization constituting of many internal and external parties seems to pose challenges to delivering information through the organizational interfaces to everyone that it concerns. The language and culture barriers were understood to further enhance these challenges.

The rapid pace of change as well as the lack of prioritising in development seem to contribute to an information overflow. According to some of the interviewees, the information overflow can lead to seriously weakened possibilities to internalize information and learn. Based on the data it appears that the lack of environmental awareness and competence may then further limit one's ability to search for help and support in environmental questions.

Looking at the bigger picture, it seems, based on the data, that there is a lack of knowledge on how to update information from organizational level to another. There were differing opinions among the interviewees on whether the company's vision is clear enough regarding the environmental perspective and consequently, whether the strategic level targets are clear enough. What was agreed on, however, was that there are challenges in updating the strategic level messages to tactical level and thereby also to operational level.

The lack of communications management becomes apparent in a couple of different ways. First, according to the interviews, it seems that the messages sometimes reach the receivers on the last minute or too late, causing uncertainty, worry and frustration. Some of the information, according to the data, never reaches all the parties that would need it or should get it. The forms of communication seem to be varying, as well, and there does not seem to be a consistent, mutual understanding of how managing and forwarding CER-related information should be carried out and by who.

6.3.3 Development ideas and opportunities related to the implementation of the EMS

1. *Training and environmental expertise*

Based on the data, it seems clear that there is a strong interest in increasing environmental awareness and knowledge in the whole organization. This was explained in two ways: (1) there is a need for environmental expertise in the organ-

ization and (2) basic environmental awareness and knowledge should be increased throughout the whole organization. When it comes to environmental expertise, the availability and accessibility of it was found crucial in the projects. For example the competence related to environmental permits and regulation was found important in supporting project schedules as well as in putting development ideas into practice.

Furthermore, to increase environmental awareness, knowledge and competence in the organization, the interviewees suggested that a systematic environmental training program, either self-launched or outsourced, should be planned and launched. According to the data, some of the topics that seem to need training and support most urgently include waste management; oil, fuel and chemical management; carbon footprint calculation as well as the consistent use of documents and applications. According to the interviewees, for the training program to be successful, the management must, however, know how to update information from strategic to tactical and from tactical to operational level, i.e. be aware of what kind of information is needed on each organizational level. Besides environmental knowledge, this requires knowledge of the organization's operations, tasks, roles and responsibilities. Therefore, the top management's environmental competence was also seen as an important key to an organizational environmental change.

Many ideas regarding the possible structure and content of an environmental training were presented by the interviewees. According to one of these ideas, the training should begin by explaining the reasons why CER and the related policies, principles and operations are necessary and important. The next step is to establish the right attitude towards CER. The right attitude, according to this idea means that the individual understands what kind of barriers are currently hindering CER efforts. Next, the participants are activated to contemplate on the topic in relation to their own work and working environment. As the very last step of the process, the existing organizational policies, principles and guidelines are presented to the participants.

Overall, based on the data, it seems like the types of training that are considered most efficient and convenient include face-to-face training as well as training involving active participation, relevant examples, a possibility for discussion and an opportunity to share experiences and best practices. Furthermore, presenting financial costs or profits for CER practices seemed to be considered a powerful way of motivating and illustrating the benefits of CER practices.

2. MBKR (management by key results) to support CER

Another supporting mechanism for CER and the implementation of the EMS that was especially highlighted in the data was the consistent alignment of MBKR with CER targets and efforts. On the whole, the interviewees called for stronger internal incentives, such as target-setting, measurable performance indicators and follow-up, for the CER development and implementation.

3. Internal cooperation and employee empowerment

Systematic cooperation between segments and other internal organizational fragments was suggested as a solution to enhance CER in the company as well as in the Infrastructure projects segment. Involving all organizational levels in the planning of strategies, policies and operations seemed to be considered particularly important, because according to the interviewees, it would contribute to shared understanding as well as a better commitment towards CER. Furthermore, according to one suggestion, the individual employees' expertise and experience as well as the learnings from individual projects should be more effectively documented and utilized and circulated between different new and old projects.

4. CER organization and reallocation of resources

Based on the data it looks like there is a consensus of opinion between the interviewees that the development of CER and the implementation of the EMS require more resources. According to one view, the company already has most of the resources and what is needed is a more suitable and efficient allocation of these resources. According to another view, the company needs to acquire more resources in order to manage and develop CER as well as to implement the EMS successfully. However, in either of these cases, the organization should carefully map out and plan where exactly the resources are needed and why. This study provided some insights regarding this question.

There were slightly differing views on how the environmental management should be organized in the company. According to the first one, there should be an environmental department dedicated to coordinating, planning, developing and implementing CER measures, such as the EMS. These types of views were justified by saying that this would ensure that there are roles in the organization that are fully committed to CER and that would consistently develop and improve CER. Furthermore, the environmental organization would act as a clear and easily accessible support function in CER-related questions.

According to the other view, which seemed to be more prevalent, the basic tasks and responsibilities related to environmental management should be largely integrated in everybody's day-to-day work while only the environmental reporting, development and stakeholder networking would belong to the environmental organization. According to this view, this arrangement would ensure that the environmental management and efforts did not concentrate on one, narrow group of individuals but that everyone in the organization would feel responsible for CER.

5. Environmental leadership and CER culture

There seemed to be an undisputable consensus of opinion among the interviewees that leadership has a key role in the successful management and implementation of the EMS and CER, overall, in the organization. In fact, the prevailing opinion appeared to be that nothing significant will be achieved without the management commitment and leadership. The role of leadership was found es-

pecially critical in keeping up and increasing the rate of change, establishing appreciation towards the environmental topic, creating momentum for and a belief in the change as well as overcoming change resistance.

Based on the data, it seems that there is an understanding among the organization according to which improving CER and implementing an organizational environmental transformation would require the creation of a strong organizational environmental culture, according to the interviewees, a similar to the one YIT currently has regarding occupational safety. This is something that could be achieved through environmental leadership, which according to the interviewees involves e.g. environmental change agents, leading by example, top management's personal interest in the topic, management competence on the topic, strategic targeting, management's communication as well as prioritizing and investing in CER.

One of the most important things that, according to the interviewees, leadership can contribute to is the credibility of and genuine belief in the change. One of the interviewees illustrated the impact of leadership to the credibility of the topic by comparing it to acting: For the performance to be credible, the actor or actress needs to truly put their soul into it. The audience will easily notice any artificiality or affectation, which draws their attention away from the story. According to the interviewees, to successfully implement the EMS and CER in general, it is important that managers show personal commitment and interest towards the topic. This commitment should show in their behaviour and in their communication about topic. Finally, according to the interviewees, it is important that this commitment is shown by managers on all organizational levels.

6. Improving CER communication

The interviewees had multiple ideas for improving CER- and EMS-related communication. First of all, regular face-to-face support was asked for by many interviewees. Informal, innovative discussions on the CER topic without a strict agenda were found beneficial and productive especially by the interviewees who took part in the focus group interviewees. The focus group interviews got plenty of positive feedback and some of the participants thought similar kinds of meetings could be useful in contributing to internal connectedness, discussion and learning in the organization.

Digitalisation was also considered something that could be harnessed to support the EMS implementation and CER, overall. Digital tools such as reporting with the help of QR codes, digital information displays as well as a digital platforms, apps or networks to share CER- and EMS-related best practices were suggested as ways to improve communication related to environmental matters. Integration of CER with the existing daily, weekly and monthly practices was assumed to be a functional way to implement the EMS, also concerning communication. Learning through real-life, relevant or familiar examples was also emphasized in the data.

7. Proactiveness and networking

As a large company, YIT, including YIT Infrastructure projects organization, was expected to actively take part in stakeholder networking and the development of the whole industry. Especially cooperation and dialogue with environmental legislators and authorities was considered important in order to contribute to environmental responsibility on the industry level.

8. Utilizing best practices from occupational safety

During the research, it became apparent that the occupational safety culture at YIT is extremely strong and that the development work regarding occupational safety has paid off. Many ideas presented by the interviewees indicated that some of the best practices from occupational safety development could perhaps be utilized in CER development as well. According to many of the interviewees, CER and occupational safety should, in fact, be developed and implemented more hand in hand.

6.3.4 Threats in case of an unsuccessful implementation of the EMS

1. Lagging behind in development

Based on the data, it seems many of the participants believe that if the organization does not operate sustainably and continuously develop its CER, there is a possibility that at some point it might not be able to compete or even operate anymore. The current sustainability-related development was assimilated with the rapid technological development as a result of which companies that have lagged behind in development have not been able to compete anymore or have fallen out of business. The EMS was considered an important contributor to the CER development that was found crucial in remaining profitable and surviving in the changing societal and business environment.

2. Realization of financial and reputational risks

Other possible threats that were expected to likely follow in case of a failure to implement the EMS were financial and reputational damages to the company, the segment or for example to one project. According to the interviewees, for example people's increasing awareness of and scrutiny towards CER-related aspects in the era of social media might easily contribute to reputational damage in case environmental work is neglected. Reputational damage, according to them, could further contribute to financial risks. Furthermore, ISO 14001 certification was described as an important client demand. Therefore, the inability to maintain the certification or explain the practical implications and value of the EMS to the client could also possibly contribute to negative financial consequences.

3. Giving up

Moving onto a more practical level, one threat that could be identified from the interviewees' answers was that too many contradicting pressures, an information

overflow, unclarity of guidelines or lacking support would contribute to frustration and the neglect of the important CER-related measures and tasks.

4. Weakened trust and credibility

The inadequate information flow related to the implementation of the EMS and other CER-related developments was expected to contribute to mistrust and the loss of credibility towards CER development. Inadequate or irregular flow of information was assumed to cause insecurity and fear of sudden changes in plans. Undesirable changes in plans and production caused by factors related to the environment or CER were found to affect attitudes towards environmental work, overall.

5. Weakened transparency

Insufficient competence, unclarity of guidelines, lack of practical support, lack of resources and possible mistrust resulting from an unsuccessful implementation of the EMS were factors assumed to contribute to weakened transparency.

7   DISCUSSION

In this chapter, the results of this study will be discussed from the perspectives of the theoretical framework of this study as well as other existing literature and case-studies. Based on the discussion, recommendations on what kind of actions YIT and especially the case organization, YIT Infrastructure projects, could take in order to improve their CER and the implementation of the ISO 14001 EMS, have been given. The key remarks and action plan have been gathered together in TABLE 12.

Looking at the results from a wide-scale perspective, the four main factors affecting how CER becomes apparent in YIT Infrastructure projects organization in practice, seem to be the stakeholders, the context of the organization as well as leadership and management (FIGURE 17). These factors will be discussed more closely in the following chapters. The factors identified in this study, that affect the ISO 14001 EMS implementation in the case organization go very much in line with previous research, which particularly highlights the importance of employee and stakeholder involvement as well as environmental skills and management commitment (e.g. Chiarini, 2019). However, contrary to for example Chiarini's (2019) findings, no fundamental resistance toward CER or the EMS was encountered during this study. Furthermore, the personnel interviewed in this study seemed to be rather well aware of the environmental aspects and impacts of their work. Understanding the bigger, life-cycle picture and the interconnections between the different environmental aspects and impacts was found more challenging.

In line with Boiral's (2011) findings, there were challenges in YIT Infrastructure projects regarding the documentation of EMS. The documentation was perceived excessive and resource-consuming and its purpose and practical usefulness were not quite understood. This was the case particularly on project and site levels. There were some indications of a lack of EMS continuity, as well. However, unlike in the cases Boiral (2011) studied, the regularity of audits and reviews or the system continuity between them did not seem to be among the main EMS implementation challenges in YIT Infrastructure projects. Instead, based on this study, it looks like in YIT Infrastructure projects, the continuity between the "check" and "act" phases of the PDCA model is an area that could be improved. This can be inferred for example from the fact that there seemed to be a decoupling between gathering data and managing based on it.

Similarly to Boiral's (2011) findings, in YIT Infrastructure projects, too, there seemed to be a need to communicate more clearly about the importance of the standard. The other challenges Boiral (2011) found in the practical implementation of the ISO standards, that is, the strong emphasis of external pressures in the decision to adopt the standard and the insufficiency of resources regarding some operations and roles were also found in this study. However, YIT Infrastructure projects did not seem to have the problem of externalizing the implementation

process of the EMS. In other words, the implementation was carried out by internal personnel which, according to Boiral (2011) contributes to the adjustment of the EMS to the organization's needs.

The results from this study also seemed to align quite closely with the previous findings regarding the overall sustainability transition of the construction industry. Martek's et al. (2019) results that indicate difficulties in considering all the sustainability dimensions as an integrated entity, a lack of leadership as well as a lack of sustainability awareness within the industry and in the society overall, were supported by this study, too. Furthermore, balancing the interests of stakeholders, especially clients, with the organization's interests as well as the TBL of sustainability was found a challenge in the Swedish construction industry (Isaksson & Linderoth, 2018) and in YIT Infrastructure projects. All in all, it seems that the long-term benefits of sustainability to the construction industry are still not understood and overall, sustainability is not yet understood as an intrinsic part of construction (Isaksson & Linderoth, 2018). According to the results from this study, this applies to YIT Infrastructure projects, too.

FIGURE 17 Key factors affecting how CER becomes apparent in practice in YIT Infrastructure projects

7.1.1 Stakeholders and the context of the organization

Based on the results, the impact of institutional pressures as well as the organization's stakeholders', especially the external ones', values, requirements and demands on the decision to implement the ISO 14001 EMS, appears to be considerable. Similar results from the construction industry have been presented by e.g. Chiarini (2019) who, just like the interviewees in this study, stated that the ISO

14001 certification is considered important or in some cases, even compulsory for the organization's ability to participate in tenders and bids. This represents one way in which the ISO 14001 EMS can be linked to the organization's financial performance (Chiarini, 2019). Furthermore, the results from this study show that the client's values seemed to play a particularly important role in how ambitiously CER was considered on project level.

At the same time with the high external pressure to implement the EMS, there were multiple factors among the results indicating challenges in internal involvement in the implementation process, including e.g. lack of environmental awareness and knowledge as well as an incomplete integration of the EMS with the organization's day-to-day practices and the employees' work identity. Based on this combination of high external pressure and incomplete internal involvement, it can be concluded that the integration of the EMS in the organization still appears to be, according to Boiral's (2007) model, "ritual". Thus, by increasing internal involvement regarding the integration of the EMS, the organization could yield the benefits that Boiral (2007) suggested the "mobilized" integration strategy could contribute to. One of these benefits was increased environmental awareness, which, together with knowledge, skills and attitude (Shuffler, DiazGranados & Salas, 2011), would further boost the ability of the employees to be involved in the implementation and integration of the EMS in the organization. This way, increasing the internal involvement in the implementation of the EMS could contribute to continuous improvement. Overall, the high emphasis on the external pressures for certification, sometimes at the expense of internal involvement, has been mentioned in the literature as one of the key challenges in the implementation of management standards (e.g. Boiral, 2011 and Chiarini, 2019).

The context of the organization, according to International Organization for Standardization (2015), encompasses interested parties relevant to the EMS, their needs and requirements, the applicable compliance obligations as well as all other external and internal issues that are relevant to the achievement of the EMS' aims and objectives. Besides the stakeholders discussed above, other important contextual factors affecting how CER becomes apparent in YIT Infrastructure projects include the regulatory developments and future pressures discussed in chapter 2.2 of this study. These are related to the wider societal megatrends that YIT has considered in formulating its strategy: sustainable development, urbanization and digitalization. The interviewees also mentioned the differing values between generations as well as the challenges and opportunities related to the development of the industry. Considerable internal contextual factors of the organization could be seen to include for example the recent merger with Lemminkäinen. The internal contextual factors, however, will be discussed more closely in the following chapters, 7.1.2 and 7.1.3.

To keep up with the pace of these megatrends and the changes taking place within the organization's context, both internal and external networking is required. This view is supported by e.g. Allred, Fawcett, Wallin, and Magnan (2011, as cited by Uhl-Bien & Arena, 2018), who specifically highlight networking as a

means of reacting to the dynamic, rapidly changing environments. When it comes to a large company such as YIT, this adaptability could, as stated by some of the interviewees, even mean influencing the external context through the company's wide stakeholder network. Through influencing its external context, the company could support the ability of the entire construction industry to respond to the sustainability megatrend. Furthermore, to contribute to their strategic, long-term environmental targets, YIT and YIT Infrastructure projects should actively build and maintain their wide networks and learn from them. The concurrent, considerable changes in the organization's context as well as the renewal of the company's strategy could be seen as signs of a beginning organizational transformation, in case of which Cora (2013) highlights the importance of networking as a factor contributing to success.

Networking has also been seen as a crucial element in contributing to circular economy. According to Korhonen, von Malmborg, Strachan and Ehrenfeld (2004), organizations that wish to contribute to the creation and development of so called industrial ecosystems, must apply systems thinking, network and particularly emphasize opportunities in their stakeholder management. Industrial ecosystem is a vision of a network between firms and other operators, where material and energy circulate, which results in as minimal as possible an amount of waste exiting the system (Jelinski et al., 1992; Graedel & Allenby, 1995 and Graedel, 1996, all cited by Korhonen, et al., 2004). Furthermore, interdisciplinary cooperation is required in YIT Infrastructure projects to increase environmental expertise and develop environmental performance on practical project level, in a long-term time scale. According to DeJong, Tibbett and Fourie (2015), the unawareness of environmental aspects of construction projects leads to a narrowed perspective which, through emphasizing technical or other aspects over environmental ones, can ultimately lead to unexpected, long-term environmental changes. They therefore propose that scientists should be closely engaged already in the early design phases of construction projects.

Stakeholder networking and receiving feedback from external sources have also been seen as a critical factors in the creation of the sense of urgency towards change (Kotter, 1996). According to Kotter's (1996) theory, a high external pressure towards the organization's CER should, in itself, have some contribution to the sense of urgency towards the change. Besides the external pressure toward the organization's CER, there are other factors, too, that indicate a strong sense of urgency for organizational environmental change in YIT Infrastructure projects. Based on the interviewees' definitions of CER and the EMS as well as their understanding of the reasons behind the change, it looks like their attitudes towards CER are generally acceptive and that they understand the urgency for change towards a more environmentally responsible direction both societally and organizationally.

7.1.2 Leadership

Several factors in the results, including unclear roles and responsibilities, the lack of top-down steering and incentives, the incomplete integration of the EMS with the day-to-day practices and employees' work identity, the fragmented organizational culture and the challenges in information flow and update, indicate that there is room to improve when it comes to the creation of organizational environmental culture and the establishment of a continuous guiding coalition for the organizational environmental change in YIT Infrastructure projects. Furthermore, when asking the interviewees about why the organization should operate environmentally sustainably and what they think the reasons behind the adoption of the EMS are, the answers did not seem to indicate a strongly diffused organizational CER culture. This could be seen for example in that rather few of the interviewees mentioned YIT's strategy or values when it came to the question of why to operate environmentally sustainably. On one hand, the answers showed rather comprehensive understanding of the reasons behind the organization's need to operate environmentally sustainably, including discussion on for example how to avoid greenwashing, which has been defined as "a gap between symbolic and substantive actions", the latter of which refers to the actions aligned with the sustainability approach (Prasad & Holzinger, 2013 and Walker & Wan, 2012, both cited by Siano, Vollero, Conte & Amabile, 2017, p. 27). On the other hand, the focus of them still seemed to lie rather heavily on the external pressures toward CER and the EMS as well as on personal and societal values instead of organizational or company values.

CER is, however, highly visible, even emphasized in the company's vision and strategy. Some of the interviewees stated that this indicates the top management's commitment toward CER. Based on Gine's et al. (2008, as cited by Dolan et al., 2012) theory, the public announcement of CER commitment can be expected to, at least to some extent, enhance the top management's and the personnel's behaviour toward fulfilling the promised results. Furthermore, when it comes to Kotter's (1996) theory of change management, YIT's forward-looking vision and ambitious strategic targets contribute to the creation of the sense of urgency, which solidifies the basis for change. According to Souza and Alves (2017), to direct the organizational decision-making and operation towards sustainability improvement, the principal decision-makers must establish a policy including a statement of what sustainability means for the organization. Following this thought, it could be stated that the purpose of the organization's management system and the EMS should also be associated with the overall direction of the company and communicated clearly.

The result show that there were differing views in the organization about the clarity of the company's vision from the perspective of the environmental pillar of sustainability. To be more specific, especially the placing of CER among the company's other strategic and development priorities was considered unclear. Furthermore, some of the results indicated that there is a need to determine what the vision and strategy mean for each organizational level, function and

operation and to the company, overall. Souza and Alves (2017, p. 2675) call this "contextualization of organization sustainability performance", explaining that the organization must clarify its sustainability perspective in relation to its sectoral, local, regional and global context. According to Kotter (1996), to ensure the understanding and internalization of the change message in the organization both intellectually and emotionally, the leaders should engage people from all organizational levels to define what the vision and strategy mean to different roles. Furthermore, the repetition of the vision or the change message in different forms contributes to the maintenance of the sense of urgency which according to Kotter (1996) is the basis for the responsiveness to change.

However, to ensure the clarification, communication, diffusion and acceptance of the change vision, strategy and message, a continuous, powerful guiding coalition is needed (Kotter, 1996). Continuous in this case means ensuring that there are leaders for the change on all organizational levels: Group and segment top and middle management, divisions, units, projects and individual construction sites. Involving change agents from all organizational levels would ensure that the guiding coalition forms a continuous chain of messengers and listeners. This is because we tend to base the credibility and authority of the messenger to their similarities with (Durantini et al., 2006, as cited by Dolan et al., 2012) and familiarity to ourselves (Liu et al., 2017). Besides as a crucial, continuous mediator of the environmental information and feedback, the guiding coalition can be understood as an important support network for the environmental managers and officials who, according to Gluch and Räisänen (2012), are in a difficult position between the main organization and the project level "organizations". In other words, the guiding coalition can be seen as a factor blurring the rather sharp interfaces between the different organizations and teams related to the operating model of construction industry.

Based on the results, especially the ones regarding the challenges with information transit and the unclarity of roles, there seems to be an absence of a clearly defined and documented guiding coalition for the CER-related matters in YIT Infrastructure projects. The interviewees' perception of a lack of practical support on project and site levels indicates that there is a specific gap in the guiding coalition between the main organization and the project level. Therefore, based on this study, it looks like there is a need to dedicate resources particularly on project and site support functions. On Group level, YIT already has the Green Growth programme and sustainability responsibles to manage and steer CER development. The already great teamwork and team spirit that, when it comes to the results from this study, were detected especially on operational level, could be utilized in the formation of a guiding coalition.

Among the development ideas given by the interviewees, there was a statement about the importance of the leaders' genuine belief in the change. Indeed, the so called authentic leadership, the definition of which includes aspects such as acceptance of personal and organizational responsibility for actions, outcomes and mistakes (Henderson & Hoy, 1983, as cited by Gardner, Cogliser, Davis & Dickens, 2011); genuineness; hopefulness; a visionary mindset; responsiveness;

(Begley, 2001, as cited by Gardner et al., 2011); intentionality (Bhindi & Duignan, 1997, as cited by Gardner et al., 2011); self-knowledge (Begley, 2004, as cited by Gardner et al., 2011); purposefulness, passion, self-discipline (George, 2003 and George & Sims, 2007, both cited by Gardner et al., 2011) as well as confidence and resilience (Gardner et al., 2011), has been shown to contribute to positive beliefs, commitment, loyalty, involvement, proactiveness (Amunkete & Rothmann, 2015 and Joo & Nimon, 2014, both cited by Bakari, Hunjra & Niazi, 2017), cooperativeness (Bakari et al., 2017), innovativeness, creativity (Černe et al., 2013, as cited by Bakari et al., 2017) self-efficacy (Bakari et al., 2017) and trust towards the top management (Fox et al., 2015 and Wong et al., 2010, as cited by Bakari et al., 2017), in the followers.

Leaders can construct authenticity through self-understanding, openness to objectively recognizing and evaluating realities, orientation to networking (Kernis & Goldman, 2006, as cited by Gardner et al., 2011), awareness, action based on genuine preferences and values (Kernis, 2003 and Kernis & Goldman, 2006, both cited by Gardner et al., 2011) and consistency between words and actions (Shamir & Eilam, 2005, as cited by Gardner et al., 2011). Overall, authentic leadership seems to support the positive pathway of creating a sense of urgency and readiness for change. Furthermore, it appears to be closely aligned with the concept of transformational leadership, therefore enhancing pro-environmental initiatives and contributing to employees' pro-environmental passion and behaviour, as Robertson and Barling (2013) have found.

Concrete actions to support authentic leadership and the establishment of a continuous guiding coalition could, based on the remarks made above, include e.g. team building, team training and environmental training targeted for the members of the guiding coalition. Through improving interpersonal relations and social interactions, clarifying goals and roles as well as solving problems (Klein et al., 2009, as cited by Shuffler et al., 2011), team building would strengthen the teamwork based on mutual understanding, support, trust and a common goal that Kotter (1996) defines as crucial for the successful operation of a guiding coalition. Team training, on the other hand, would contribute to the guiding coalition's understanding of their shared goals (Shuffler et al., 2011); the knowledge, skills and attitudes required to achieve them and the set of competencies, strengths and areas to improve that they have as a team (Salas & Cannon-Bowers, 1997, as cited by Shuffler et al., 2011). Furthermore, it could improve their required leadership and management skills as well as other skills, knowledge and attitudes required to further the implementation of the EMS and to improve the CER in general.

The findings of a study by Matinaro and Liu (2017), conducted in the context of Finnish construction industry, show that due to the pragmatic and result-oriented thinking in construction companies, the management of innovation, culture and people is not among the management priorities. To foster organizational innovativeness, Matinaro and Liu (2017) recommend putting more emphasis on

the management of soft people-related factors, of which they particularly emphasize collaboration and communication. Similar remarks can be made based on the results of this study as well: the focus on systems development is high but there seems to be a lack of consistent CER leadership and individual support. Based on these remarks, it can be recommended that the next specific focus areas in the CER development would be leadership- and people-oriented.

Besides providing environmental, leadership and management training to the senior management and the whole guiding coalition, Chiarini (2019) also suggests that the senior management's environmental awareness could be raised by assessing and communicating the economic value and financial returns related to CER. Chiarini (2019) recommends a close cooperation between external auditors, consultants and the senior management in raising awareness of the key environmental aspects and impacts and their value. In YIT Infrastructure projects, the interaction and teamwork between internal auditors, too, could be enhanced, along with their cooperation with the senior managers. In fact, the internal auditors' potential as members of the guiding coalition should be considered, because they play a key role in mediating information through the, according to Gluch and Räisänen (2012), sharp cultural and information interface between the main organization and the project and site level "organizations".

According to the results of this study, the interviewees did not yet see CER as an inseparable part of their own day-to-day work or as a part of their work identity and role. Furthermore, there was quite considerable variation in the interviewees' perceptions of whether there is a need to go beyond compliance when it comes to CER. Some emphasized complying with the concurrent compliance obligations, some particularly highlighted proactiveness and continuous improvement. All in all, reviewing Kotter's (1996, p. 148) definition of culture as "norms of behaviour and shared values among a group of people", it can be concluded that CER does not yet seem to be completely rooted in the organizational culture of YIT Infrastructure projects. Signs of improvement could however, as mentioned, be seen in some of the interviewees' descriptions of environmental attitudes.

The message of the organization's priorities, values, vision and strategy, targeted and tailored for each organizational level and communicated through the continuous chain of change agents formed by the guiding coalition would likely further the integration of CER in the organizational culture quite considerably. However, as mentioned when discussing authentic leadership, the consistency between words and actions must be ensured to contribute to thinking and behaviour changes in people. Liker (2004, as cited by Clark et al., 2013) particularly accentuates that all decisions must be consistent with the long-term goals, even if that means compromising the short-term goals. Hence, factors such as resilience and self-discipline, leading by example, investing in CER and dedicating resources to enabling CER development and practices can be seen important in creating an organizational environmental culture and contributing to environmental performance improvements. Leaders improving their own environmental competence as well as showing interest and commitment toward the

change by following up the change process and giving feedback about the improvements and non-improvements, could be considered as examples of concrete actions to support the establishment of an organizational environmental culture.

Rewards and feedback channels, such as award and recognition programs, profit-sharing programs, increase in pay, benefits and incentives, suggestion programs (Atwater & Bass, 1994; Laabs, 1992; Leitch et al., 1995; Marks, 2001 and Patton & Daley, 1998, all cited by Govindarajulu & Daily, 2004), or simply recognizing the pro-environmental actions through collective or individual communications to notice actions dedicated to the improvement of CER, are also ways to enhance the environmental performance of employees. These measures can be seen as ways of expressing interest, support and demand toward the improvement. In YIT, integrating CER more closely into the MBKR (management by key results) system, as was suggested by some of the interviewees, might work as an incentive to improve CER-related work. Furthermore, the integration of CER with the, according to the results of this study, already rather strong occupational safety culture at YIT could be one way to solidify CER in the organizational culture.

7.1.3 Management

To ensure outcomes, improvements and value from the management of sustainability, Souza and Alves (2017) have proposed a LIMSSI model integrating the different quality, safety, environmental and social responsibility management systems' requirements, lean management philosophy as well as the triple bottom line (TBL) of sustainability (FIGURE 18). When it comes to the results from this study, it seems that an integrated model could suit YIT Infrastructure projects organization when it comes to implementing the ISO 14001 EMS and improving the organization's CER, since there seems to be a specific challenge in the organization regarding the employees' understanding of CER as an intrinsic part of their role.

Furthermore, it looks like there is room to improve concerning the integration of the EMS' requirements into the organization's day-to day practices, overall. One particular aspect that could be spotted from the data concerning this was the frustration and irritation that was felt towards all kinds of documentation related to the EMS. Continuously thinking about how to integrate the EMS with the rest of the management system more closely and how to harmonize the documents and practices better between environmental and social responsibility, safety and quality, could provide some solutions to this problem. Boiral (2011), who studied the challenges of EMS implementation in practical settings, particularly highlights the importance of simplifying documentation as much as possible, targeting it only to value-adding and central procedures and all in all, integrating the EMS into the existing practices and structures as well as possible. However, according to Boiral (2011), sufficient resources are also required to ensure the intended effects of the documentation and the EMS, overall.

According to Souza and Alves' (2017) LIMSSI model, the second step after ensuring a consistent direction for the organization as well as the top management's support and leadership toward the implementation of this direction, is increasing and maintaining awareness regarding all topics integrated in the management system, including their main tools, advantages and potentials. Besides providing knowledge and skills, Souza and Alves (2017), similarly to e.g. Shuffler et al. (2011), emphasize the overall enhancement of employee receptivity to the change and the actions it requires. According to this study, there is clearly a need for YIT Infrastructure projects to take action to build up and maintain the required competence needed to successfully implement the ISO 14001 EMS and to continuously improve CER.

Following Souza and Alves' (2017) thinking, according to which an integrated approach would ensure the required sustainability outcomes and development, the training needs regarding all of the topics integrated in the management system should be mapped out. Based on this information, it might be that some of the trainings could cover different sustainability topics with similar types of challenges related to their implementation. For example, according to some of the interviewees, safety and environmental topics overlap in many ways, which could be seen as an opportunity for using a simultaneous, integrated way of implementing them. In YIT Infrastructure projects' case, this could prove to be particularly beneficial for the creation of a pro-environmental culture and the implementation of environmental policies and practices, because according to the interviewees, lots of work has already been done and improvements achieved when it comes to the establishment of occupational safety culture and the implementation of occupational safety practices. Thus, integrating environmental and occupational safety management might give power and support to the environmental topic, as well.

Based on the results regarding the unclear roles and responsibilities, it appears that there is a considerable need in the case organization to assign clear roles and responsibilities and communicate them widely. This is also the next step in Souza and Alves' (2017) model. According to them, the heart of the LIMSSI management would be comprised of a LIMSSI coordinator, at least one responsible for environmental, quality, safety and social responsibility as well as a value stream manager who would manage the mapping, understanding and optimization of the value stream as an entity. All of these roles would then work in a close cooperation with each other and the senior management. This is very much in line with the ideas presented about the guiding coalition in chapter 7.1.2. Based on these remarks I have illustrated a suggestion for what a guiding coalition could look like in FIGURE 19. Furthermore, roles and responsibilities regarding other areas than the ones mentioned here should also be clearly assigned and communicated to avoid unnecessary waste of resources and hindrance or work due to unclarities.

There seems to be a strong focus on systems development in YIT Infrastructure projects at the moment, and considerable improvements have recently been made regarding the environmental reporting systems, project management and

information management. In developing systems, their educational, communicational and other people-related potential could be considered utilizing for example the MINDSPACE framework. The systems could for example show what kind of progress others have made, utilize defaults when possible and increase salience with visual or other effects. All in all, it seems that lots of CER data is already being gathered in YIT Infrastructure projects through systems, programs and audits. More information could still be gathered and documented from site visits. Furthermore, some interviewees suggested that CER could be more visible in the personnel surveys. This would not only bring more visibility to CER but also provide more information to support decision-making and development.

However, besides the establishment and improvement of systems, the development focus should also be targeted at the management based on the data and information gathered through the systems. Based on the results, this seemed to be one of the key areas to improve in YIT Infrastructure projects. Essentially, this is about establishing continuous, cyclical processes that follow the PDCA framework as well as ensuring that all existing processes are continuous and yielding results. This way, valuable planning and development work will not be wasted and continuous improvement will be enabled. In this study, it became apparent that in the case organization, processes whose continuity and circularity should be reviewed or improved include e.g. information transit, actions based on data gathered from the projects through systems and site visits as well as the transit of information and best practices from one project to the next one. Systems development may provide help to some of these areas of improvement, but also systematic cooperation and communication between individuals, teams and different organizational levels is needed. The results from this study particularly showed that the "good old" meetings in person and site visits were very much hoped for.

These remarks are aligned with Souza and Alves' (2017) recommendation of conducting value stream mapping, which essentially means examining and learning to know the current processes and activities, their strengths and on the other hand, their challenges and wastes. Through this analysis it is possible to target development and actions toward the right areas of and opportunities for improvement and thereby avoid waste, increase efficiency and deliver best possible value to customer (Souza & Alves, 2017). In line with Kotter's (1996) framework, the unnecessary processes, activities or details should be removed.

According to the ISO 9001 standard, the organization must control its externally provided processes, products and services (Souza & Alves, 2017). Therefore, it must take measures to extend its sustainability policy to concern subcontractors, suppliers and other partners. According to Souza and Alves (2017), the follow-up and evaluation of supplier performance should be conducted through continuously mapping out their activities. The results from this study show that there is a lot of variation in how fluent the cooperation with suppliers, subcontractors and other partners is concerning CER but also in general. Furthermore, during this study, it became apparent that there is a lot of subcontracting and partnering

taking place in the organization. Therefore, extra attention should be paid in the development of fluent cooperation with subcontractors.

In their model, Souza and Alves (2017) recommend designing a desirable future state value stream based on the current state analysis. Defaulting success like this might work as a way to encourage improvement and to clearly define the desired outcomes as well as the steps towards them in YIT Infrastructure projects, as well. However, to determine the current and required levels for sustainability performance, the organization must define measurable performance indicators (Souza & Alves, 2017). This was suggested as one area of development by some of the interviewees, too.

Besides motivation, encouragement and cultural support, the implementation of the ISO 14001 EMS and the continuous improvement of CER require management which, according to Modig and Åhlström (2019), encompasses enabling the flow of measures and events (just-in-time) as well as the ability of everyone to know what is going on concurrently and what is going to take place next (jidoka). The discussion above is very much focused on the former. However, as a large organization, YIT Infrastructure projects could be expected to face challenges regarding the latter, too.

Challenges related to the jidoka principle were, indeed, found in the case organization. They seemed to particularly concern the discontinuity of communication as well as the uneven distribution of knowledge and awareness regarding CER, the management system, the EMS, systems and programs in general as well as roles and responsibilities. Furthermore, the fact that the projects seemed to be unaware of the CER-related best practices used in other projects seemed worrying from the perspective of lean thinking. The interviewees' thoughts about the possible scenarios in case of an unsuccessful implementation of the EMS also relate to challenges and problems regarding communication and support.

All in all, it seems that actions must be taken to improve information management in YIT Infrastructure projects. These actions could include e.g. trainings, systems supporting communication and overall, clearer definition of and communication about processes and systems. The ISO 14001 manual that was recently launched in YIT Infrastructure projects provides a basis for the communication and guidance regarding the environmental responsibility and the practical measures related to it. However, the use of it, along with other documents, should be further supported through training, communication and follow-up.

Initial, introductory environmental trainings have been organized in YIT Infrastructure projects. Other specific needs for training identified in this study were the following: the benefits and reasons of having a management system and an EMS; environmental attitudes and work identity; life-cycle thinking; the long-term benefits of CER as well as documentation, i.e. why and how to use it to benefit from it. Providing training regarding the central societal areas of development discussed in chapter 2.2 such as circular economy, carbon footprint and the other likely future requirements could also be considered. Furthermore, during this study it became apparent that training is still needed in the everyday

environmental work such as waste management and the handling of hazardous or harmful substances. Finally, the fact that an environmental expert's support was available and accessible was found crucial in the projects. This further confirms the conclusion that besides systems-based support, specific expertise and support to individual projects is also pivotal in successful CER work and development.

Finally, it must be noted that the implementation stages of project management, the EMS and the management system overall vary between the countries that YIT Infrastructure projects operates in. Furthermore, the amounts and types of resources available differ between countries. Particular emphasis in the EMS implementation and the CER development should thus be given to the cooperation and mutual support between the countries as well as to the balancing of requirements and resources.
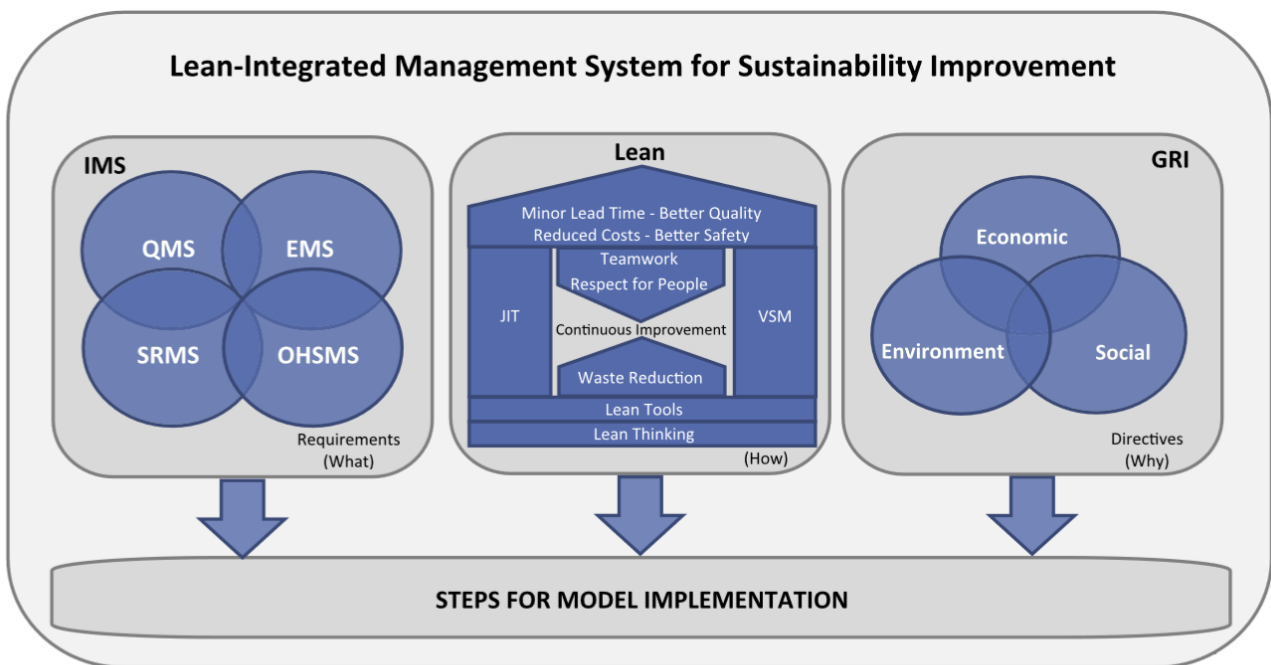

Fig. 2. Structure of LIMSSI model.

FIGURE 18 LIMSSI model encompassing an integrated management system, lean management philosophy and the TBL of sustainability (Souza & Alves, 2017, p. 2673)
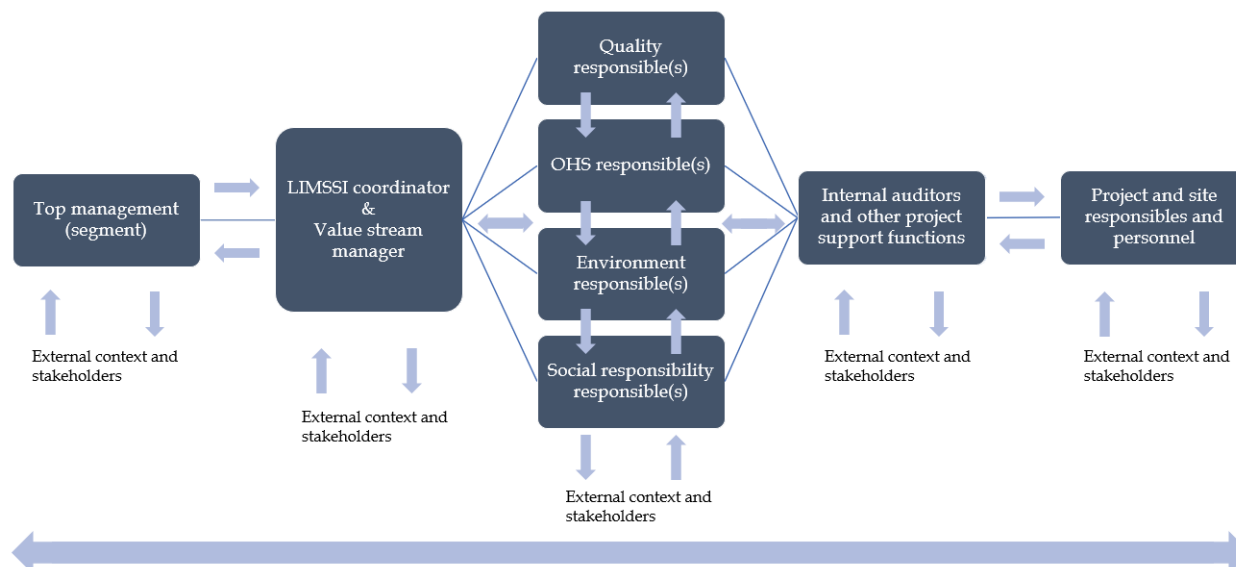
FIGURE 19 A suggestion of a guiding coalition for the TBL of sustainability in YIT Infrastructure projects, partly based on Souza and Alves' (2017) theory of an integrated management system and its implementation. The arrows illustrate information flow.

7.1.4 Towards TBL balance

The discussion above essentially concerns the management of information and processes as well as the attitudes, motivation, competence and interests of the internal and external stakeholders of YIT Infrastructure projects. This management aims at achieving CER performance improvements and supporting the successful implementation of the ISO 14001 EMS in the case organization. Through Souza and Alves' (2017) model, the TBL was included in this discussion. Indeed, it appears that finding a balance between the environmental, economic and social dimensions of sustainability in an optimal way that supports the interests of the wide range of stakeholders involved in construction projects and construction industry, overall, is a central challenge to be tackled in the construction industry (Isaksson & Linderoth, 2018). In the light of the results from this study, it can be concluded that this seems to be the case for YIT Infrastructure projects, too.

Isaksson and Linderoth (2018) who examined this challenge in the context of the Swedish construction industry think that the core of the problem is the institutional setting, i.e. the lowest price tender policy, where the investment costs have typically been emphasized over long-term costs. Therefore, factors that have made the bid more expensive have not been included in it. To overcome this challenge, Isaksson and Linderoth (2018) suggest that first of all, managers must be competent enough regarding the CER-related matters to be able to justify to the clients, how the integration of environmental concerns in the project will benefit them. Besides financial benefits, sustainability in construction may also yield reputational, marketing-related and social benefits to the client (Nalewaik

& Venters, 2010). Through collective learning and the growing awareness among construction managers and practitioners as well as clients and other stakeholders, including environmental considerations in construction projects may become more of a norm (Isaksson & Linderoth, 2018).

Isaksson and Linderoth (2018) find that in the end, to include environmental concerns in construction, the contracts will have to focus on long-term costs. To determine the costs and benefits of a system over its whole lifetime, life-cycle costing (LCC) can be used (Nalewaik &Venters, 2010). LCC reveals the life-cycle cost savings that environmentally sustainable construction may contribute to, thereby widening the perspective from the mere investment costs which may, at the first glance, look lower than the costs of environmentally sustainable construction. Nalewaik and Venters (2010) discuss the use of sustainability rating tools as a means to systematically consider the sustainability performance, costs and benefits of each design element from the perspectives of the certification points, i.e. the sustainability considerations listed in the rating tool. In other words, the sustainability rating tools provide a systematic way to evaluate options from the TBL perspective (Griffiths et al., 2018).

Besides guiding the project toward more optimal choices, Griffiths et al. (2018) found that the sustainability rating tools may improve sustainability-related knowledge in the project, provide best practice elements to the project, work as an education tool or aid, increase individuals' confidence in working with sustainability-related issues, provide a community, improve communication with peers, clients and the public as well as improve the flow of information, learnings and best practices from one project to another. Martek et al. (2019) agree with Nalewaik and Venters' (2010) and Griffiths' et al. (2018) findings in their study related to the context of Australian building industry, saying that the adoption of a holistic view that the sustainability rating tools provide (Tam & Zeng, 2013, as cited by Martek et al., 2019) is an essential step for the sustainability transition of the construction industry. However, they state that the development and improvement of these tools must continue in order to remove their current deficiencies that they say may even hinder sustainability development. These deficiencies include e.g. the rating tools' incomplete and narrow view of areas (Xia et al., 2015; Jackson, 2016; Doan et al., 2017 and Martek et al., 2018, all cited by Martek et al., 2019) as well as their leniency (Iyer-Raniga et al., 2014, as cited by Martek et al., 2019).

The new ways of thinking and behaving that the sustainability rating tools enhance contribute to the establishment of a sustainability culture (Griffiths et al., 2018). Certainly, based on these findings, using a sustainability rating tool, such as CEEQUAL could support the implementation of the ISO 14001 EMS and the continuous improvement of CER in YIT Infrastructure projects on project level. Furthermore, the findings of Griffiths et al. (2018) indicate that the sustainability rating tools have potential to bring new views and requirements to the management system and even to the strategy and policies. Based on these notes, famil-

iarizing with sustainability rating tools and considering the use of them in supporting the implementation of the ISO 14001 EMS and the improvement of CER as a whole, could be recommended to YIT Infrastructure projects.

TABLE 12 An action plan to support the implementation of the ISO 14001 EMS and the improvement of CER in YIT Infrastructure projects

Factor contributing to organizational environmental change / EMS implementation success	Key strengths	Key areas to improve	Recommended actions
External stakeholder values, requirements and demands as well as the external context of the organization	Wide stakeholder network	Active stakeholder networking and proactively influencing the external context of the organization	Proactively promoting the interests of the construction industry in stakeholder networks Dedicating resources to proactive environmental development work, such as internal and external stakeholder networking as well as scanning the organization's context and stakeholder networks Establishing a system for networking to enhance the reuse and recycling of soil and other materials Involving scientists and other experts from different fields already in the early design phases of construction projects to widen perspective and avoid unexpected changes
Sense of urgency	High external pressures to be environmentally responsible and to implement the ISO 14001 EMS Personnel seems to be aware of the factors affecting the need for change Personnel seems to accept the need for change and be willing to contribute to the change Publicly announced, ambitious long-term targets	Visibility of vision and strategy to everyone	Repetition of the vision and the change (CER) message in different forms

	Initial environmental training has been organized		
Guiding coalition	Team spirit on construction site level	Absence of continuous guiding coalition for CER	Establishing a continuous chain of messengers (guiding coalition) from Group and segment management, divisions, units, projects and individual construction sites
	There are highly interested individuals in the organization with potential to lead change in a guiding coalition	The cooperation and information transit between the internal and external auditors, consultants and the senior management	Utilizing the already well-functioning teams in the formation of the guiding coalition
	Group level Green Growth development programme for sustainability	Project support functions	Arranging team building and team training to the guiding coalition to enhance their environmental, leadership and management skills
			Assessing and communicating the economic value and financial returns related to CER
			Establishing and maintaining close cooperation between external auditors, consultants and the senior management in raising awareness of the key environmental aspects and impacts and their value
			Including internal auditors in the guiding coalition and enhancing their cooperation and interaction with each other as well as the senior management
			Dedicating resources particularly to project and site support functions
Vision, strategy, targets and sustainability policy, their communication and ensuring the compliance with them	Reviewed strategy highlighting the environmental pillar of sustainability	The clarity and order of strategic priorities	Determining the placement of CER among the strategic priorities and communicating it consistently
	Publicly announced, ambitious long-term targets	Updating strategic message to tactical and operational levels	Determining what the vision and strategy mean for each organizational level, function, operation and role and engaging different organizational levels and functions in this discussion

		Ensuring fluent cooperation with subcontractors, suppliers and other partners	Communicating the organization's priorities, values, vision and strategy to each organizational level in a tailored, targeted form
			Ensuring that compliance with sustainability policy is required from subcontractors, suppliers and other partners, ensuring continuous follow-up and evaluation of supplier and partner performance and overall, focusing on development of the co-operation with especially subcontractors
Facilitating the implementation of the EMS and ensuring the ability of all internal parties to be involved in it	Resources of a large company can be viewed as an asset when it comes to any development	Sufficient resources and prerequisites for CER development and management (time, skills, knowledge, expertise, human resources, etc.)	Planning and establishing trainings or training programs especially regarding - The benefits and reasons of having a management system and an EMS - Environmental attitudes and work identity - Life-cycle thinking - The long-term benefits of CER - Basics, such as waste management and the handling of hazardous or harmful substances - Central societal topics, e.g. circular economy, carbon footprint and its calculation, future requirements - The consistent and practical way of using documentation (e.g. the practical ISO 14001 manual as well as other guidelines and reports) - Environmental management (for managers)
	Systems in place and under development to ease environmental reporting, project management and information management	The clarity of roles and responsibilities	Assigning unambiguous roles and responsibilities and communicating them clearly and visibly
		Follow-up and feedback	Follow-up, feedback, rewards and recognition
		Communication and information transit	Harmonization of documentation between segments and different areas of sustainability (quality, safety, environment, social)
			Mapping out opportunities to implement occupational safety and environmental responsibility as an integrated approach (e.g. communication, documentation, site visits, best practices)

			Considering people-related aspects (e.g. the MINDSPACE framework) in systems development
			Defining a set of relevant and measurable performance indicators for CER
			Focusing on ensuring the balance of requirements and resources particularly in the countries where there are fewer resources available than in Finland
Generating short-term wins and contributing to change continuousness	Management system in place Project management Strong focus on and improvements made in systems development	Continuous, cyclical processes Management system still under development	Ensuring that all existing processes are continuous and necessary
			Ensuring that all EMS requirements are included in a continuous process and establishing processes to those requirements that are not managed systematically
			Establishing continuous processes for (at least) - information transit - actions based on data and information gathered through systems or site visits - the flow of information and best practices from one project to the next one
			Utilizing the personnel survey(s) in measuring CER improvement and gathering data for management reviews
			Considering the potential of using the LIMSSI model in management system development
Creating and maintaining an organizational environmental culture	CER highlighted in vision, strategy and development	Integrating CER in the existing practices and the employees' work identity Including soft, people-related factors in CER leadership and management	Establishing a guiding coalition for CER, particular focus on closing the cultural and information gap between the main organization and the project and site "organizations"
			Ensuring the visibility of CER in communication
			Investing in CER (e.g. training programmes, procurement policies, networking)
			Embedding CER as a part of the already rather strong and accepted occupational safety culture and development

			Integrating CER more closely to the MBKR (management by key results) system
			Emphasizing the leadership and management through soft factors
			Leading by example, e.g. leaders improving their own competence regarding the environmental topic
			Examining the potential of using CEEQUAL on project level as e.g. - a guideline in directing and supporting the responsibility of decision-making and the diffusion of the strategic message - education tool - a bank of best practices and considering the utilization of it in management system development

8 CONCLUSIONS

8.1 Key takeaways from the study

As a whole, the findings from this study seem to go hand in hand with the existing literature regarding the implementation of ISO standards or EMSs in construction industry as well as with previous findings about the challenges in the sustainability transition of the construction industry. Furthermore, the challenges of environmental management in YIT Infrastructure projects seemed to be very similar to what has been found regarding construction industry, overall. It was also interesting to notice that the findings from this study seemed to correspond my preunderstanding of the possible challenges related to the implementation of the EMS in the case organization, described in chapter 1.2.

Based on the findings from this study as well as the literature review, it seems that YIT is particularly advanced when it comes to having environmental sustainability integrated in the company vision and strategy. Furthermore, the fact that the personnel understood of the environmental aspects and impacts of their work as well as the reason for the change quite well was found a strength regarding the implementation of the ISO 14001 EMS in YIT Infrastructure projects organization. However, a lot still remains to be done especially when it comes to the leadership of CER and the systematic continuity of development.

Referring to Kotter's (1996) model, it can be concluded that the sense of urgency as well as the personnel's general openness to change and willingness to act provide a firm basis to environmental change in YIT Infrastructure projects. When it comes to leadership and management, the interface between the main organization and the project and site level seems to require specific attention. At the moment, it appears that the pressure and enthusiasm toward CER work and development on project level still largely depends on the client's requirements, the project size and resources as well as the project and site level managers' personal interest in environmental matters. Project management is considered functional at least in the Finnish context, which is regarded as an asset in monitoring and managing CER performance. When it comes to the top-down incentives and demands as well as transformational, authentic kind of encouraging and consistent leadership concerning the organizational environmental change and the implementation of the EMS, there is still room to improve. I have illustrated the relationship and imbalance of top-down and bottom-up pressures regarding CER in YIT Infrastructure projects in FIGURE 20.

Overall, when it comes to management, there is a great emphasis on systems development to enhance the flow of operations and information as well as to support the visual control and visibility of the strengths, challenges and progress of different development processes. More emphasis, however, is required

on the integration of CER and the ISO 14001 EMS to the existing structures, systems, operations and culture of the organization. Furthermore, attention should be paid to the identification and communication of the internal benefits resulting from the implementation of the EMS. The existence of processes as well as the circularity and continuity of the existing processes must be ensured, as well.

There is also room for improvement regarding the leadership and the management of soft, people-related factors. The employees' ability to be involved in the implementation of the ISO 14001 EMS is crucial and must be ensured by providing them sufficient environmental skills, knowledge, attitudes, motives, resources and support. A clearly defined, active guiding coalition would be an important part of this kind of employee empowerment.
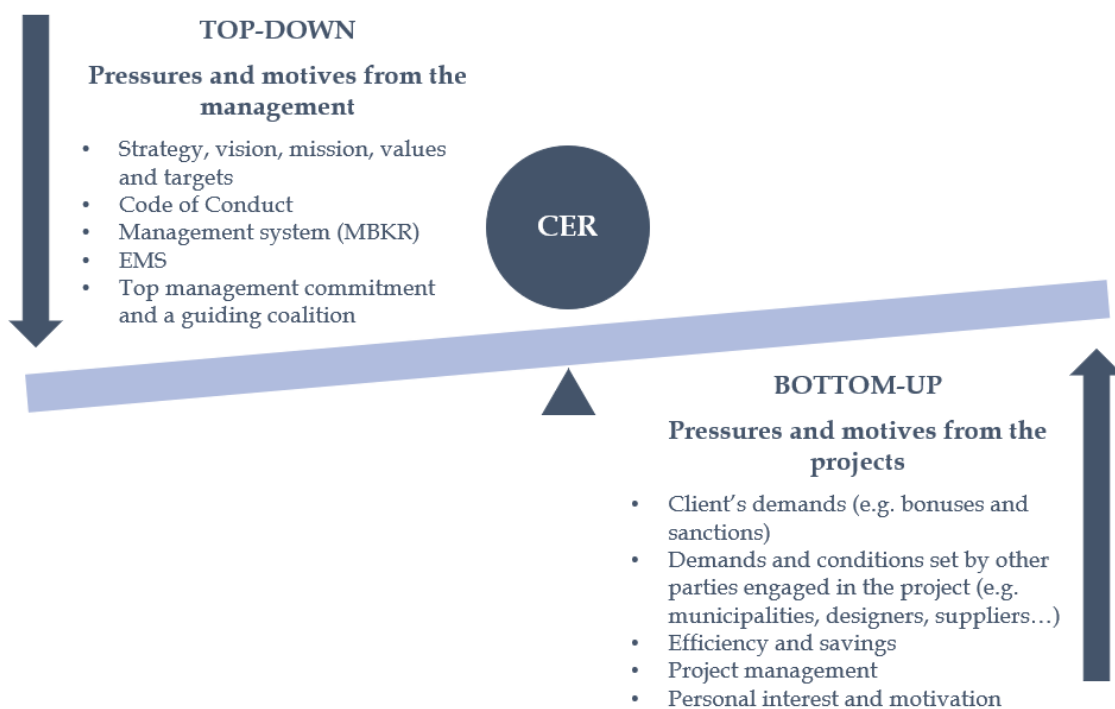
FIGURE 20 Illustration of the relationship of top-down and bottom-up pressures regarding CER in YIT Infrastructure projects

8.2   Assessment of the trustworthiness of the study

The recommended way to assess the trustworthiness of a qualitative study involving content analysis would be considered from four perspectives: credibility, transferability, dependability and confirmability (Graneheim & Lundman, 2004 and Bengtsson, 2016, both cited by Tuomi & Sarajärvi, 2018).

8.2.1 Credibility

Credibility encompasses aspects such as applicability and neutrality (Tynjälä, 1991, as cited by Tuomi & Sarajärvi, 2018) as well as the assessment of whether the study participants have been described sufficiently and whether the data is reliable (Parkkila et al., 2000, as cited by Tuomi & Sarajärvi, 2018). The alignment of the researcher's interpretation with the studied individuals' and systems' perceptions is also a part of credibility (Eskola & Suoranta, 1996, as cited by Tuomi & Sarajärvi, 2018). Furthermore, the alignment between the researcher's reconstruction of the studied individuals' or systems' reality and their true reality, is one aspect of credibility (Niiranen, 1990 and Tynjälä, 1991, both cited by Tuomi & Sarajärvi, 2018).

The individuals and groups heard during this study have been documented in enough detail to demonstrate the diversity of sources from different organizational departments and levels. Furthermore, the number of sources was sufficient. In fact, during the study process, it became apparent that even a smaller number of sources might have been enough to answer the research questions. The participants were chosen through snowball sampling and were all working in YIT Group level or YIT Infrastructure projects organization. All the interviewees were either developing YIT's strategic direction or the EMS or using the EMS in practice. Therefore, the full range of contributors to EMS implementation were included in the studied sample.

The diversity of the sample can thus be regarded sufficient in the Finnish context. However, the studied system, YIT Infrastructure projects organization, operates outside Finland, too. In this study, there were participants from all the countries YIT Infrastructure projects operates in. However, the coverage of the data concerning other countries but Finland can be questioned, since it did not extend from the country EMS developers and managers to the practical implementers of it. In other words, project and site personnel from the other countries were not interviewed in this study. This creates a bias in the results, discussion and conclusions toward the Finnish context. Thus, when planning the concrete actions and next development steps based on this study in the case organization, the overemphasis on the Finnish reality must be considered.

The data described above was collected using multiple means: one-to-one interviews, focus group interviews, meetings and observation. Furthermore, the theoretical background for the case was rather wide and included synthesizing many theories within the fields of change management and environmental regulatory and management instruments. The use of multiple sources, methods and theories, i.e. triangulation (Tuomi & Sarajärvi, 2018), has been found to contribute to the credibility of a case study (Flick, 1992 and Peräkylä, 1997, both cited by Riege, 2003).

The systematic combining, i.e. the continuous interplay between theory, the case, the empirical world and the framework (Dubois & Gadde, 2002) during the collection of the data as well as during the analysis of the data and the findings, can be seen as the cross-checking of the results. This has been stated to foster the

credibility of the study. In practice, this meant that besides continuously examining the relevant theory during the data collection as well as the analysis of the data and the findings, I was working in the organization, facing new experiences, meeting professionals and constantly learning. This helped me formulate a full picture of both system from both social and technical perspectives.

8.2.2 Transferability

Eskola and Suoranta (1996, as cited by Tuomi & Sarajärvi, 2018) have questioned the possibility of utter transferability due to the diversity of social reality. However, they too, believe that the study results can be transferrable to other contexts within certain terms. Parkkila et al. (2000, as cited by Tuomi & Sarajärvi, 2018, "Laadullisen tutkimuksen suhde luotettavuuskysymyksiin", para. 5) describe these terms as a "corresponding external context". Niiranen (1990, as cited by Tuomi & Sarajärvi, 2018, "Laadullisen tutkimuksen suhde luotettavuuskysymyksiin", para. 5) and Tynjälä (1991, as cited by Tuomi & Sarajärvi, 2018, "Laadullisen tutkimuksen suhde luotettavuuskysymyksiin", para. 5) have a similar view, that is, they describe transferability as "the possibility to transfer the results to another context, depending on the similarity of the studied context and the context where the results are applied".

According to Yin (1994, as cited by Riege, 2003), comparing findings with existing literature with the aim of finding similar outlines and generalizing the previous findings and conclusions in the specific context of the study, contributes to the transferability of a study. This has been done in the discussions section of this study. Furthermore, according to Riege (2003), having predetermined questions increases the transferability of a study. In this study, both the research questions and the interview questions were predetermined.

Due to the case-specific nature of the study as well as the fact that it was primarily focused on finding the best solutions for the case of YIT Infrastructure projects, the transferability of the results and conclusions of this study is intrinsically limited. However, based on the connections made between this study and the existing literature addressing similar questions in the context of construction industry, it can be said that the findings and conclusions of this study could give ideas and direction to others in corresponding contexts.

8.2.3 Dependability

Dependability of the results requires that an external party examines the research process (Niiranen, 1990, as cited by Tuomi & Sarajärvi, 2018) as well as the consideration of external and other related factors that may cause variation (Tynjälä, 1991, as cited by Tuomi & Sarajärvi, 2018). Some of these factors can be unexpected, which the researcher must consider while conducting the research (Eskola & Suoranta, 1996, as cited by Tuomi & Sarajärvi, 2018). According to Lincoln and Guba (1985, as cited by Riege, 2003), the examination conducted by an external party takes place in the design phase of the research process. Its purpose

is to assesses, besides the matters mentioned above, the order, understandability and documentation of the process and to detect and prevent possible bias. When it comes to this study, the research proposal made in the beginning of the research process was assessed by the study supervisors from University of Jyväskylä and YIT Infrastructure projects as well as by the peer group consisting of other Master's Thesis writers from University of Jyväskylä.

8.2.4 Confirmability

Confirmability means that an external party assesses the deliverables of the study (Niiranen, 1990, as cited by Tuomi & Sarajärvi, 2018). According to Riege (2003), the confirmability of a study is constructed by e.g. the detailed description of the study's methods and procedures as well as the completeness and transparency of the study. The methodology and the process of the study are described in detail in chapter 5 of this document. The assessment of the trustworthiness of the study, together with the description of the process and methods contribute to the transparency of this study. The data gathered for this study was recorded and transcribed word for word, after which it was analysed. Furthermore, the observations and meetings were documented using detailed notes. These matters can be understood to contribute to the confirmability of this study.

The final report of the study, i.e. this document, is fully available and open for anyone to read. Both during the writing process and just before its publication, the document has been reviewed by the study supervisors from University of Jyväskylä and YIT Infrastructure projects as well as by the peer group consisting of other Master's Thesis writers from University of Jyväskylä. This kind of transparency has been stated to contribute to the trustworthiness of a research (Yin, 1994, as cited by Riege, 2003).

8.3   Suggestions for further research

Based on the literature review made as a part of this study, it appears that while the outcomes and motivations of the implementation of ISO 14001 EMS seem to be well studied, there is a lack of literature on what factors are related to the successful implementation of it, particularly in the context of construction industry (Chiarini, 2019). This study sheds light on this question, however, directionally, since the findings are case-specific. Based on this study, it can be concluded that the network of factors contributing to the successful implementation of the EMS and the development of CER in general, is complex and wide and seems to involve a lot of people-related, soft factors. Therefore, the case study method could be suggested for the research of this topic. However, to formulate a more general view of the topic, a method combining qualitative and quantitative means, such as the one Chiarini (2019) has used to estimate the situation in the Italian construction industry, could be used.

According to Martek et al. (2019), in contrast with the current view according to which the sustainability transition in construction industry is mainly hindered by technical aspects, a more considerable challenge is in fact formed by the underlying people-related factors related to it. Furthermore, Matinaro and Liu (2017) also state that, in the context of Finnish construction industry, the management of innovation, culture and people is not among the management priorities and more emphasis should be put on this kind of management. These findings are at least partly supported by this study, as well. Based on this study it can also be stated that the lack of leadership and the possibly resulting problems in employee involvement may, together with the great external pressures that CER in construction industry faces, contribute to a ritual implementation of an EMS with no considerable CER performance improvements. Therefore, besides studying the technical solutions to enhance CER in construction industry, specific research focus should be targeted at how the people-related, soft factors, leadership and culture could contribute to improved CER.

Finally, according to Isaksson and Linderoth (2018) as well as Martek et al. (2019), there are difficulties in balancing the TBL of sustainability in construction or more specifically, truly integrating CER in the projects (Isaksson & Linderoth, 2018). The problem seems to lie specifically in the lack of understanding of the long-term value of integrating CER in the project and on the other hand, the overemphasis of the investment costs (Isaksson & Linderoth, 2018). More research should therefore be conducted to find out the long-term economic implications of integrating CER in construction projects. This could include piloting the use of a sustainability rating system. Furthermore, a case study involving a pilot of the use of an EMS and a sustainability rating system together could, when compared with a case of only using an EMS, shed light into whether and how a sustainability rating system would support the implementation of an EMS and increase its positive outcomes.

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APPENDIX

APPENDIX 1 Interview structure

Perceptions, knowledge and understanding of corporate environmental responsibility, environmental requirements and pressures, environmental impacts and the EMS
1 What is corporate environmental responsibility? What is an environmentally responsible company like?
2 What do you think environmental responsibility means to YIT / YIT Infrastructure projects?
3 What comes to your mind when talking about an environmental management system (EMS)?
4 Why does YIT Infrastructure projects have an EMS?
5 What kind of requirements and demands does YIT / YIT Infrastructure projects face at the moment regarding environmental responsibility and from whom?
6 What kind of environmental impacts does YIT / YIT Infrastructure projects contribute to?
Perceptions of the environmental management and responsibility currently at YIT / YIT Infrastructure projects
7 How do the requirements of the ISO 14001 standard affect YIT Infrastructure projects' operations?
8 What kind of challenges or problems do you see or have you experienced regarding the management of environmental matters? What has felt difficult? Why do you think so?
9 What kind of strengths do you see or have you experienced regarding the management of environmental matters? What has felt functional or easy? Why do you think so?
Improvement ideas
10 How would you improve the management of environmental matters in YIT / YIT Infrastructure projects?
11 What could top management / middle level management / operative management / employees do to improve the environmental responsibility of YIT / YIT Infrastructure projects?
12 Do you think more resources are needed to improve the environmental responsibility and management of YIT / YIT Infrastructure projects? What kind of resources?