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Advancing the understanding of sustainable business models through organizational learning

Bejtush Ademi[1] | Alf Steinar Sætre[2] | Nora Johanne Klungseth[1]

[1]Department of Mechanical and Industrial Engineering, Faculty of Engineering, Norwegian University of Science and Technology, Trondheim, Norway

[2]Department of Industrial Economics and Technology Management, Faculty of Economics and Management, Norwegian University of Science and Technology, Trondheim, Norway

Correspondence

Bejtush Ademi, Verkstedteknisk, P405, Gløshaugen, Richard Birkelandsvei 2B, Trondheim 7031, Norway.
Email: bejtush.ademi@ntnu.no

Abstract

Increased regulations and shifting consumer priorities are driving businesses to become more sustainable and to develop more sustainable business models. To achieve this, businesses must have a solid understanding of sustainability. Organizational learning (OL) is a key capability that helps firms understand and adapt to new phenomena such as sustainability. We explore the nexus between OL and sustainability by examining how organizations learn about the latter. We employ an embedded case study approach, conducting 49 interviews and collecting over 1,000 pages of archival data. Our findings reveal concrete learning mechanisms that enhance understanding of sustainability and sustainable business models, including knowledge creation/acquisition, retention, and transfer, in business practices. Our study provides scholars and business practitioners with a detailed framework to guide the operationalization of OL to gain sustainability knowledge.

KEYWORDS

organizational learning, sustainability, sustainable business models, sustainable development

1 | INTRODUCTION

Sustainability is increasingly dominating the business agenda of companies worldwide. Stakeholders such as customers, partners, and regulatory bodies increasingly demand that businesses address sustainability (Ritala et al., 2018). Simultaneously, sustainable entrants threaten to take away established companies' businesses and threaten their social license to operate (Demuijnck & Fasterling, 2016). Firms also realize that new opportunities rooted in sustainability can create competitive advantages (Stubbs & Cocklin, 2008). Consequently, companies increasingly seek to become more sustainable by innovating business models that integrate sustainability at the core of their business strategies (Kennedy et al., 2017; Stubbs & Cocklin, 2008).

The term sustainability, which originates from ecology, has multiple definitions and is often vague (Ariansen, 1999). Viewed from a business perspective, sustainability involves integrated management (Eccles & Krzus, 2010, 2014), which entails the "process of including Environmental, Social, and Governance (ESG) performance in close coordination between business processes, functions, groups, organizations, and systems" (Sroufe, 2018, p. 4). Similarly, Elkington (1999) coined the term "triple bottom line" and defined sustainable development as "involving the simultaneous pursuit of economic prosperity, environmental quality, and social equity" (Elkington, 1999, p. 397). Furthermore, sustainability is defined as knowledge and is regarded as a "strategic and specialized resource that firms use to execute sustainability-oriented policies and strategies" (Silva et al., 2023, p. 948). This is grounded on the knowledge-based view of organizations (Grant, 1996), which defines knowledge as a "resource to be possessed by organizations and individuals, [that] can be captured, created, transferred, stored, and retrieved (Barley et al., 2018, p. 280). In this study, we define sustainability as a

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balancing act of pursuing "economic prosperity, environmental quality, and social equity" (Elkington, 1999, p. 397) and view sustainability knowledge as a strategic resource to implement sustainability (Silva et al., 2023).

Implementing sustainability and developing sustainable business models remain a challenge for organizations (Schaltegger et al., 2016; Silva & Nunes, 2022). This requires a shift from prioritizing economic interests over environmental and social ones, as seen in neoclassical economics (Friedman, 2007), to sustainability logic, which takes a holistic approach to consider a wider range of stakeholders, including society and the planet (Freeman, 1984; Montabon et al., 2016). Such a shift requires the acquisition of new knowledge, and changes to "current organizational routines and practices" (Bianchi et al., 2022, p. 104), and results in the emergence of new values and organizational culture (Silva & Figueiredo, 2017). Business practitioners generally lack an understanding of sustainability and when a business is sustainable, often referring only to the economic viability and endurance of a business model. The environmental and social aspects of sustainability are considered add-ons and not part of the core activities of a business (Dyllick & Muff, 2016). This raises a crucial question about innovating for a sustainable business model, as one of our informants put it: "How can we innovate for something we do not understand?" Innovating for sustainability is complex unless business managers understand what sustainability is, how to integrate it within an organization's culture and mindset, how to integrate it into business strategy, and how to contribute to sustainability (Roome & Louche, 2016). Developing new knowledge and expertise is key to addressing sustainability and reinventing businesses to become more sustainable (Porter & Derry, 2012).

We propose an organizational learning (OL) process to gain sustainability knowledge. OL is the change process in an organization's knowledge base, behavior, and beliefs (Argote & Miron-Spektor, 2011; Argyris & Schön, 1997). It is widely applied in theorizing organizational processes (Elkjaer, 2022), including sustainability learning (Hermelingmeier & von Wirth, 2021). OL is the capability to process new knowledge to understand sustainability and carry out sustainability-related changes within organizations (Hermelingmeier & von Wirth, 2021). Implementing sustainability and integrating stakeholders' sustainability-related needs requires organizational changes that may fall outside their existing knowledge; hence, new knowledge is required (Sroufe, 2018; Wijethilake & Upadhaya, 2020). "Companies can and must adapt or even transform their existing business models through OL and new routines and knowledge to cope with increasingly sustainability-driven demands" (Schaltegger et al., 2016, p. 6). The learning process helps organizations understand and adapt to the challenges and opportunities presented by sustainability, operationalize sustainability, and develop sustainable business models (Sroufe, 2018). OL guides organizations in creating and acquiring new knowledge, transferring it across the organization, and embedding it in routines and individuals (Huber, 1991). Hence, OL capabilities are crucial for developing sustainable businesses.

The nexus between OL and sustainability has been explored in the literature (Bianchi et al., 2022; Broman & Robèrt, 2017;

Hermelingmeier & von Wirth, 2021; Silva et al., 2023; Smith, 2012), yet the current understanding of how companies learn to address sustainability is limited (Hermelingmeier & von Wirth, 2021; Quartey & Wells, 2020). Existing research argues that organizational leaders must foster OL for sustainability, but how to do so is often overlooked (Smith, 2012). The lack of systematic processes for developing OL impedes the implementation of sustainability practices (Oelze et al., 2016). There is a need for research investigating the "concrete underlying learning mechanisms, triggers, and structures that enable these particular types of learning in a business (ecosystem) and in relation to the different BST [business transformation for sustainability] levels" (Hermelingmeier & von Wirth, 2021, p. 1847). Furthermore, it is necessary to explore different approaches and strategies that firms can adopt to enhance their learning processes and develop the capabilities required to implement sustainability. Doing so involves exploring different training and knowledge acquisition methods and recognizing the impact of stakeholder engagement and collaboration in facilitating OL. OL also entails studying approaches for sharing knowledge among different units, groups, and individuals, along with methods for integrating new knowledge into the established routines and practices of the organization (Fortis et al., 2018; Hermelingmeier & von Wirth, 2021; Oelze et al., 2016). Researchers recommend focusing on learning, understanding the exact ways in which an organization learns, and integrating sustainability logic.

We explore how a large, established organization learns about sustainability. A multinational, publicly listed conglomerate operating in multiple industries and aiming to be a frontrunner in sustainability serves as our setting for an embedded case study. Embedded case studies allow for an in-depth investigation of organizational phenomena, such as OL, to become more sustainable (Eisenhardt & Graebner, 2007; Ozcan et al., 2017; Yin, 2018). This study addresses the following research question: How do organizations learn about sustainability to achieve more sustainable business models?

This study contributes to the literature in several ways. First, we respond to literature that suggests exploring and unfolding the practical aspects of fostering learning for sustainability (Fortis et al., 2018; Hermelingmeier & von Wirth, 2021; Quartey & Wells, 2020). These aspects are often overlooked in the existing literature. Our study advances research on the link between OL and sustainability by examining businesses' commitment to sustainability from an OL perspective. Second, we offer empirical insights into the learning mechanisms that drive business practices to enhance understanding of sustainability. Third, we present a framework for scholars and business practitioners that offers guidance for operationalizing OL to achieve a better understanding of sustainability. Specifically, we offer a set of methods for creating and acquiring new knowledge; sharing it across the organization, from business units to departments and individuals; and embedding it in routines and individuals.

The remainder of this paper is organized as follows. We discuss the key theoretical underpinnings and present our conceptual model in Section 2. The research method and key findings are presented in Sections 3 and 4, respectively. The results and conclusions are presented in Sections 5 and 6, respectively.

2 | THEORETICAL BACKGROUND

This section discusses the OL literature, elaborates on the OL and business sustainability nexus, and presents a conceptual model that guides our data analysis.

2.1 | Organizational learning

OL is the process of change in an organization's knowledge base, behavior, and beliefs (Argote, 2011; Argyris & Schön, 1997) and is a function of experience (Argote, 2011). New OL experiences result in changes in an organization's core values and beliefs, which then trigger a transformation in its practices and behaviors (Quartey & Wells, 2020). The ability to learn enables organizations to change their behavior and beliefs and adapt to new environments more quickly. This is a competitive advantage when facing new entrants in the market that may be specialized in the new environment (Cohen, 1991; Levinthal & March, 1993). Similarly, the ability to learn helps organizations endure over time and decreases their failure rates (Levinthal, 1991). Therefore, the ability to learn is a source of competitive advantage in an ever-changing business environment. In addition to learning, unlearning is an important organizational ability in the learning process (Morais-Storz & Nguyen, 2017). Organizations need to continuously discard "old routines to make room for new ones" (Tsang & Zahra, 2008, p. 1437).

There are multiple learning theories. Learning from a training perspective takes a pedagogical stance and views learning as a transmission from one head to another, assuming that the learning setting does not matter. They isolate knowledge from practice and ignore its potential complexities (e.g., Wood et al., 1976). Another view of learning is the concept of legitimate peripheral participation, which argues that learners do not simply receive or construct knowledge; instead, they become part of a community of practitioners and learn from that community's viewpoint (Brown & Duguid, 1991; Lave & Wenger, 1991). This view addresses the "central issue in learning [which] is becoming a practitioner not learning about practice" (Brown & Duguid, 1991, p. 48). Here, the focus is on understanding what is learned in the context to which it is applicable.

Organizations learn through the growth and development of their existing members, or by bringing in new members with expertise that they do not possess (March, 1991; Simon, 1991). Changes in an organization's environment serve as stimuli that may require new responses that demand substantial education (Simon, 1991; Weick, 1991). Individuals within an organization occasionally need to acquire new knowledge through reeducation. In both cases, learning occurs within individuals. Nevertheless, individual learning is influenced by the organizational setting in which it occurs, making it a social phenomenon (Simon, 1991).

OL manifests in two main modes of learning and three main subprocesses. Learning modes may involve minor changes in for example procedures and policies, a process known as single-loop learning (Argyris, 1976). Business decision makers often create certain procedures and policy corrections to address an identified problem based on underlying organizational norms and values. However, tackling a particular obstacle requires questioning and changing these underlying norms and values. In such cases, OL involves significant changes that question the fundamentals of the organization, known as double-loop learning (Argyris, 2002). Thus, in single-loop learning, organizations add to the existing knowledge base, whereas double-loop learning requires changes to the existing knowledge base. The three main subprocesses of OL are knowledge creation and acquisition, retention, and transfer (Argote, 2011; Epple et al., 1991; Huber, 1991), which will be explored further in the following paragraphs.

2.1.1 | Knowledge creation/acquisition

Knowledge creation and acquisition lie at the heart of OL (Argote et al., 2021). The former is "a continuous, self-transcending process through which one transcends the boundary of the old self into a new self by acquiring a new context, view of the world, and knowledge" (Nonaka et al., 2000, p. 8). To generate new knowledge, organizations must facilitate the integration of both tacit and explicit forms of knowledge (Nonaka et al., 2000; Nonaka & Toyama, 2003). Tacit knowledge is highly personal and subjective knowledge that is difficult to formalize, whereas explicit knowledge can be documented and shared easily (Nonaka & Toyama, 2003; Polanyi, 1967). Knowledge creation involves socialization, externalization, combination, and internalization (SECI) as key phases (Nonaka et al., 2000). Socialization refers to the sharing and exchange of tacit knowledge through collective experience, whereas externalization converts it into an explicit form (Nonaka et al., 2000; von Krogh et al., 2012). The combination of various explicit knowledge elements creates more organized knowledge systems while internalizing the incorporation of explicit knowledge into tacit forms (Nonaka et al., 2000; von Krogh et al., 2012). Organizations acquire new knowledge directly from external stakeholders or create knowledge in collaboration with value chain stakeholders, referred to as knowledge acquisition and collaborative learning, respectively (Fortis et al., 2018). Universities, research centers, and other stakeholders create knowledge that can be infused into organizations, which is a time-effective form of knowledge acquisition (Fortis et al., 2018). Finally, international standards and frameworks present distinct prospects for learning and are commonly recognized as "soft law mechanisms" that guide the conduct of a company (Fortis et al., 2018).

2.1.2 | Knowledge retention

Organizational routines, standard operating procedures (SOPs), and individuals embed knowledge and help retain it over time, that is, knowledge retention (Huber, 1991; March, 1991). Organizational routines are "repetitive, recognizable patterns of independent actions carried out by multiple actors" (Feldman & Pentland, 2003, p. 95). Routines are generally viewed as a force for stability, not change. Challenging this consensus, Feldman and Pentland (2003) argue that the performative aspect of routines is a source of change. The authors regard routines as the "primary means by which organizations

accomplish much of what they do" (p. 94). Individuals also serve as knowledge repositories. Nevertheless, their effectiveness depends on employee turnover, as the loss of key organizational members can negatively impact knowledge retention. Other knowledge repositories, such as culture, transformations, structures, and ecology, are known as "knowledge storage bins" (Walsh & Ungson, 1991).

2.1.3 | Knowledge transfer

Knowledge can be transferred across business units, departments, or groups, known as knowledge transfer, which manifests itself through changes in the recipient unit's knowledge base (Argote & Ingram, 2000). Knowledge repositories, such as organizational routines and members, are crucial to this process. These are often referred to as "knowledge reservoirs"; moving these from one unit to another enables knowledge transfer across an organization (Argote & Ingram, 2000). Training and communication are other important means of transferring knowledge. To ensure efficient training programs, organizations must identify experts within their ranks and comprehend the knowledge of other members (Rulke et al., 2000). The organization's knowledge base is distributed among its various members; therefore, "knowing about one's own as well as others' expertise enables team members to retrieve needed knowledge efficiently and effectively from the 'experts' within the group" (Rulke et al., 2000, p. 135). Multiple studies have established that internal formal and informal training programs are effective and relatively easy means of knowledge transfer (Reagans & McEvily, 2003).

2.2 | Organizational learning and sustainable business development

Shifting away from conventional profit-centric approaches presents significant challenges when attempting to infuse sustainability into the core of organizational structures, necessitating a fundamental overhaul of the business model (Abdelkafi & Täuscher, 2016; Roome & Louche, 2016; Bianchi et al., 2022). Incorporating sustainability elements entails a profound examination of existing assumptions and convictions, fostering a deeper comprehension of sustainability concerns along with a systematic methodology for identifying and enacting sustainable practices (Molnar & Mulvihill, 2003). Integrating sustainability demands substantial "changes to current organizational routines and practices" (Bianchi et al., 2022, p. 104), often involving the emergence of new

organizational values and new institutional logic (Silva & Figueiredo, 2017). To navigate these challenges, organizations must initiate a learning journey centered on sustainability and participate in what is known as "sustainability-focused organizational learning" (Molnar & Mulvihill, 2003). The pursuit of sustainability, or the triple bottom line, necessitates organizations to make "substantial changes to their organizational cultures, … [which may] … involve the use of experimental or unconventional learning techniques" (Molnar & Mulvihill, 2003, p. 167).

OL can help organizations understand and respond to sustainability challenges while consistently advancing their efforts to integrate sustainable principles (Siebenhüner & Arnold, 2007; Hermelingmeier & von Wirth, 2021; Bianchi et al., 2022). It serves as a means to achieve an organization's strategic renewal and adaptation (Crossan et al., 1999). Through continuous learning and adaptation, organizations can enhance their ability to innovate, respond to changes, and seize opportunities, thus ensuring long-term success and sustainability (Crossan et al., 1999). OL facilitates the process of acquiring new knowledge, questioning established routines and practices, and improving information distribution, which are necessary to enhance the understanding of sustainability and its operational implementation (Fortis et al., 2018; Sroufe, 2018). "Organizational learning links cognition and action." (Crossan et al., 1999, p. 524). Therefore, institutionalizing learning within organizations results in the creation of structures, systems, and routines that embed knowledge and insights into their operations, ensuring that cognition translates into action and becomes a part of the organizational culture (Crossan et al., 1999). By integrating sustainability into the learning processes and practices, organizations can develop a holistic understanding of sustainability and embed it in their organizational culture (Battistella et al., 2021; Bianchi et al., 2022).

In this study, we adopt OL as a process to address how organizations learn about sustainability to achieve a more sustainable business model. As elaborated in Section 2.1, OL consists of three main subprocesses: knowledge creation/acquisition, knowledge retention, and knowledge transfer. Figure 1 illustrates the initial conceptual model of the OL process. We utilize this conceptual model to analyze our case study data.

3 | METHODOLOGY

We employ an embedded case study research design (Yin, 2018) to investigate how organizations learn about sustainability. Integrating

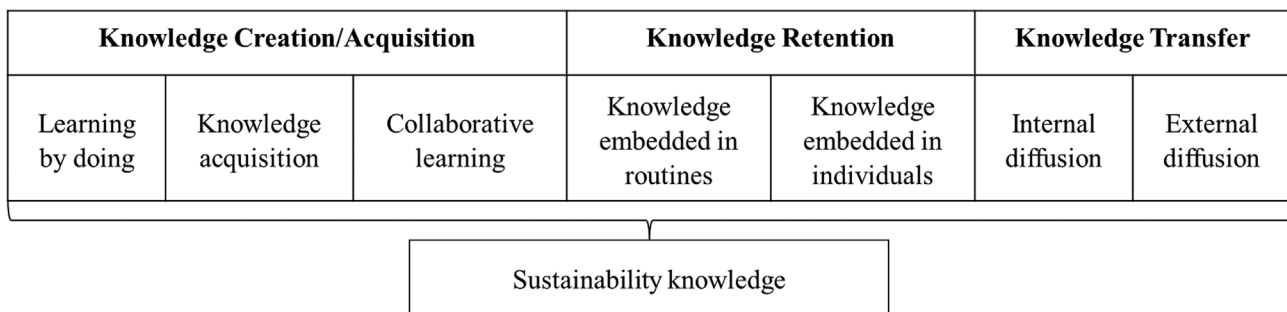| Knowledge Creation/Acquisition			Knowledge Retention		Knowledge Transfer	
Learning by doing	Knowledge acquisition	Collaborative learning	Knowledge embedded in routines	Knowledge embedded in individuals	Internal diffusion	External diffusion

Sustainability knowledge

FIGURE 1 An investigative model for sustainability learning in organizations.

sustainability into a business strategy is relatively new to companies, and research on this topic remains nascent (Geissdoerfer et al., 2018). Case studies are well suited for investigating relatively new phenomena about which little or no previous theory or research exists (Edmondson & McManus, 2007). "Case studies are rich, empirical descriptions of particular instances of a phenomenon that are typically based on a variety of data sources" (Eisenhardt & Graebner, 2007, p. 25). This makes case studies a strong research strategy for building theories (Eisenhardt, 1989; Eisenhardt & Graebner, 2007; Yin, 2018).

The embedded case study design allows for examining phenomena within multiple business units of a large conglomerate (Yin, 2018). Embedded case studies are beneficial for two reasons. First, they allow for a more systemic approach to examining a phenomenon and the ability to leverage replication logic, which is typical for multiple case studies (Eisenhardt, 1989). Second, the embedded case study allows us to investigate the research question in greater depth, from the corporate to the business level (Ozcan et al., 2017). This also enables us to conduct a cross-case analysis of the units.

3.1 | Case design and selection

Our embedded case study focuses on a multinational, publicly listed conglomerate, Helios (a pseudonym), and four (of its 50+) business units. Helios is headquartered in Northern Europe and operates in multiple countries. We do not disclose the specific country because of anonymity agreements with the conglomerate and the national research ethics board. Helios has been innovative since its inception and has placed sustainability high on the agenda, aiming to become the frontrunner in sustainable development. This is evidenced by their rankings in national and international sustainability indices. In 2022, a Big 4 consulting firm awarded Helios the highest score in the climate index among the country's top 100 Paris Agreement-aligned companies. Similarly, many Helios brands have led national sustainability indices over the past few years. This makes Helios well suited for addressing our research question. Helios is a multinational company with a 200-year history, operating in multiple industries, with approximately 7,000 employees, and in multiple countries worldwide. Helios' 50 + business units are organized into three business areas, each operating as an autonomous entity in one of the three business areas.

We identified Helios during an online sustainability conference, where we presented our research ideas. This sparked the interest of Helios' Head of Sustainability, and we decided to explore collaboration opportunities. The Head of Sustainability gave us an overview of relevant business units, individuals, and documents and helped us access those selected. Before starting a case study, ensuring access to all appropriate individuals and documentary evidence is a critical practical consideration (Yin, 2009).

Initial interviews were conducted with the executive team of Helios. The same approach was employed for the four business units. The embedded cases were selected based on theoretical sampling (Eisenhardt, 1989). Theoretical sampling is appropriate in research projects aiming to develop theories, and in case study research, it

"means that cases are selected because they are particularly suitable for illuminating and extending relationships and logic among constructs" (Eisenhardt & Graebner, 2007, p. 27). In our sampling, we included business units operating in diverse industries, facing distinct sustainability challenges, and those most dedicated to sustainability. As we analyzed the cases, we found that they demonstrated varying engagement levels with sustainability. Industry diversity helped us avoid industry-specific explanations and idiosyncrasies, while variations in business unit engagement levels allowed us "to more easily observe contrasting patterns in the data" (Eisenhardt & Graebner, 2007, p. 27). The business units come from all three business areas of Helios and operate in different industries.

A summary of Helios and the four embedded cases is presented in Table 1. Pseudonyms are used.

3.2 | Data collection

Using triangulation, we collected data through interviews and archival documents (Eisenhardt, 1989; Jick, 1979; Saunders et al., 2019).

TABLE 1 A summary of Helios and four embedded cases.

Name	Brief summary
Helios	Helios was established in the early 1800s and has become a robust portfolio of brands across multiple industries and countries. It is a publicly listed company and employs around 7,000 people. It continuously enjoys solid financial performance and aims to contribute to sustainable development on multiple fronts. One of the business units, namely Saturn, in our embedded case represents the original industry Helios grew from. The three other units were established during the last 20 years.
Saturn	Saturn was founded over 100 years ago, operates in the media industry, and has more than 100 employees. It is mainly perceived as an innovative business that is a frontrunner in digitalization. Saturn is highly invested in sustainability, aiming to contribute to sustainable development through a social mission.
Jupiter	Jupiter operates in the e-commerce sector, employs more than 400 people, and offers services to individuals and businesses. It is highly focused on contributing to sustainable development and aims to facilitate a circular economy.
Uranus	Uranus operates in the distribution industry, employs more than 100 people, and offers services to individuals and businesses. It is a reinvented business of another company that went through significant changes. Uranus is concerned with the environmental dimension of sustainability and is continuously rethinking its business model.
Neptune	Neptune operates in the finance industry, employs around 100 people, and is active in multiple countries. It mainly acts as a middleman between businesses and individuals. Neptune has taken a lead role in the industry in contributing to sustainable development.

TABLE 2 Summary of the data collected.

Company	No.	Title	Interview duration (in min)	Interview transcript pages	Archival data
Helios	1	CEO	46	10	844 pages
	2	EVP/chief people & corporate affairs	40	10	
	3	CFO	55	11	
	4	EVP business area 1	56	10	
	5	EVP business area 2	57	12	
	6	Chief Data & Technology Officer	50	10	
	7	EVP business area 3	60	10	
	8	Chief investment officer	33	10	
	9	Head of diversity	45	10	
	10	Head of sustainability (first interview)	64	12	
	11	Head of sustainable business development	72	13	
	12	Sustainability manager	60	12	
	13	Head of sustainability (second interview)	58	13	
Saturn	14	Subject matter chief	57	10	32 pages
	15	Subject matter specialist on climate	55	8	
	16	Director of consumer business	45	10	
	17	Director of sales	60	9	
	18	CEO	48	9	
	19	Executive producer of development	46	10	
	20	Executive producer	46	8	
	21	Senior product manager	42	9	
Jupiter	22	CEO	60	13	227 pages
	23	Chief product officer	60	9	
	23	Business unit manager	48	11	
	25	CFO	52	11	
	26	Commercial director	41	11	
	27	Business unit manager	48	11	
	28	Business developer 1	45	11	
	29	Senior project manager	55	9	
	30	Head of strategy	54	13	
	31	Business developer 2	46	13	
Uranus	32	Strategic director	61	13	12 pages
	33	Chief technology officer	45	10	
	34	Project director	45	10	
	35	Product owner C-to-C	43	9	
	36	Consumer director	55	14	
	37	Senior product manager	54	13	
	38	Director of innovation	72	17	
	39	CEO	55	14	
Neptune	40	CEO	53	13	12 pages
	41	Communication and sustainability manager	55	12	
	42	VP business partnerships	52	13	
	43	Project manager, strategy & business development	46	10	
	44	Head of people and culture	46	10	
	45	Business developer	53	11	
	46	Head of business development	54	13	

TABLE 2 (Continued)

Company	No.	Title	Interview duration (in min)	Interview transcript pages	Archival data
	47	Partner responsible	50	11	
	48	Data security specialist	42	10	
	49	Business developer of Main product	46	11	
Total	49		42 h and 11 min	542 pages	1,127 pages

Triangulation is "largely a vehicle for cross validation when two or more distinct methods are found to be congruent and yield comparable data" (Jick, 1979, p. 602). Interviews were the primary data source, and archival data were used to supplement the interview data.

A total of 49 interviews were conducted (54% of the interviewees were males and 46% females). First, we developed an interview protocol (McCracken, 1988; Spradley, 1979) that included four phases: aligning the interview questions with the research questions, "constructing an inquiry-based conversation" (Castillo-Montoya, 2016, p. 828), obtaining feedback on the interview protocol, and conducting a pilot study to test and improve it. We used this interview protocol for all interviews (see Appendix A). We also determined the number of interviewees and their roles per unit. We designed an information letter to inform the interviewees about the research project, their participation, how their personal data would be processed, and their rights. The National Research Ethics Board approved the information letter and the overall research project. We sent a copy of the information letter to each interviewee, who signed it prior to the interview. The interviews were semi-structured and conducted online via Microsoft Teams during the COVID-19 pandemic, specifically from September 2021 to December 2022. We invited interviewees via email, and an administrative secretary from each unit assisted us in booking timeslots in the interviewees' calendars. On average, the interviews lasted 52 minutes, and were recorded and transcribed for further analysis (see Table 2). All interviews were conducted in English. Most of the interviews were conducted by two researchers. The first author transcribed the interviews. Although time-consuming, transcribing helped to gain a deeper understanding of the data and led to smoother case write-ups.

To triangulate the data, relevant archival documents were collected to complement the interviews. Archival data allowed us to better understand the case and gain more insights into addressing sustainability (Ozcan et al., 2017). We used annual reports, sustainability reports, presentations, frameworks, policies, checklists, and other internal sustainability-related documents. Some of these documents were available online, and the interviewees sent some after referring to them during the interviews.

3.3 | Data analysis

We analyzed the data by applying theory-building "recursive cycling among the case data, emerging theory, and later, extant literature" (Eisenhardt & Graebner, 2007, p. 25). Such iterative cycling allowed
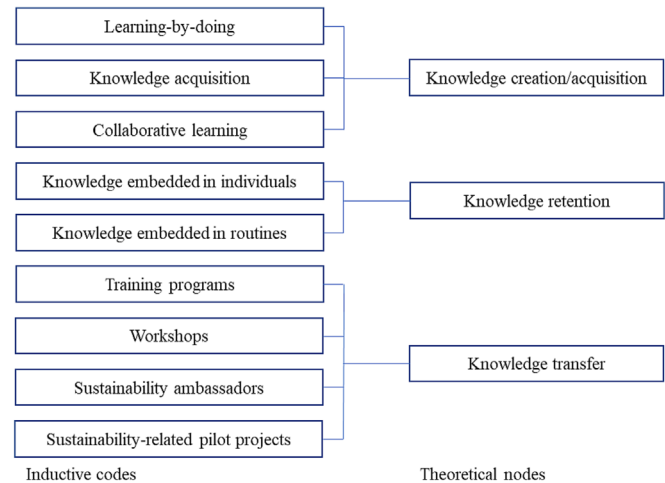

FIGURE 2 Coding tree.

us to examine the data in detail and identify patterns and relationships among the elements from the data, which served as a basis for the emerging theory (Orton, 2000). We then consulted the existing literature to examine emerging themes and theories. That is, "theory and data fed off each other" (Sætre et al., 2007, p. 141) during the data analysis. This approach is suitable and widely applied for building theories from case studies (Eisenhardt & Graebner, 2007; Langley, 1999).

We employed recursive cycling between data and theory. The first step was to develop a deep understanding of the case and each embedded case unit by reviewing the interview transcripts and collected documents. We applied open coding following the guidelines of Strauss and Corbin (1990) and Charmaz (2014) to code the qualitative data. We constructed first-order codes by staying as close to the data as possible and looking closely for "actions." Coding by looking for actions helps overcome the risk of using the author's predefined concepts and leads to open-ended coding (Charmaz, 2014). Through open coding, we identified multiple first-order concepts, which were thoroughly analyzed and grouped into higher-level second-order themes. First-order concepts led us to explore the literature on OL and sustainability. Following the literature, we designed an investigative model (Figure 1) and used knowledge creation/acquisition, retention, and transfer as themes to group the first-order concepts onto theoretical nodes (Figure 2). The main criteria for grouping first-order concepts into second-order themes were the similarities, differences, and relationships between the first-order concepts.

3.4 | Quality criteria

To ensure research quality, we evaluated our study based on its validity, reliability, and generalizability (Eisenhardt & Graebner, 2007; Yin, 2018). To ensure validity, we selected cases that represented the phenomenon using theoretical sampling (Eisenhardt & Graebner, 2007). We confirmed our findings using multiple methods or data sources, triangulation method. This enhances the trustworthiness of the case study. Finally, we used the developed protocol and followed a standardized data collection procedure.

We enhanced the reliability of our findings by maintaining consistency in data collection procedures, such as interview protocols and document analysis methods, across all cases. Moreover, we carefully managed and documented the collected data to boost the transparency and rigor of our study (Grodal et al., 2021). Additionally, we identified patterns, similarities, and differences by conducting comparative analysis between cases, owing to the utilization of multiple cases.

4 | FINDINGS

Our findings reveal how organizations create and acquire, retain, and transfer sustainability knowledge across the organization.

4.1 | Knowledge creation/acquisition

To enhance the understanding of sustainability in the organization, the Sustainability Department at Helios focused on leading knowledge creation throughout the organization. Knowledge creation and acquisition follow three paths: 1) learning-by-doing, 2) acquiring knowledge from external sources, and 3) collaborative learning.

4.1.1 | Learning-by-doing

Learning-by-doing represents a unique form of knowledge creation/acquisition by engaging in specific activities and observing others conducting them (Fortis et al., 2018). Helios' Sustainability Department drives knowledge creation through sustainability initiatives including stakeholder analysis, sustainability impact assessment, risk and opportunity identification, materiality analysis, and policy design. These initiatives and activities are more than procedural steps; they embody the company's evolving understanding and integration of sustainability into its core business strategies. This work began in 2019 and was pivotal in defining relevant sustainability aspects for all business areas. The Head of Sustainability at Helios provided additional information:

> In the autumn of 2019, we had a process that ended up in a materiality analysis to find what aspects are relevant for Helios to work with on sustainability and what our ambitions and targets should be. We had

benchmarking against peers, risk and opportunity analysis, impact analysis, and many stakeholder dialogues.
>
> (Head of Sustainability at Helios).

The comparison with industry peers and stakeholder dialogues provided Helios with a nuanced understanding of its sustainability landscape.

The initiatives resulted in significant outcomes, sparking sustainability discussions at the executive level and indicating a shift in the organization's strategic direction. Reflecting on this evolution, the EVP/Chief People and Corporate Affairs Officer at Helios stated, "… if we look at the materiality analysis and the different sustainability aspects, I would say that it is a growing maturity in terms of seeing sustainability as a business opportunity." This sentiment was echoed by the Head of Sustainable Business Development at Helios, who emphasized the materiality analysis's role in defining Helios' impact areas and aligning them with stakeholder expectations. The materiality analysis offered them an outside-in perspective on sustainability, enabling them to gain a broader understanding. These experiences highlight the practical implications of learning-by-doing in sustainability. The company has taken a deeper and more analytical approach to sustainability, moving beyond traditional compliance to embed these values in its strategies and operations.

Across the business units, the prioritization of sustainability initiatives was systematically structured through materiality analyses. This process was instrumental in understanding and quantifying sustainability impacts and setting targeted goals. The Sustainability Department at Helios worked closely with Jupiter, Saturn, and Neptune teams to identify key focus areas through materiality analyses. Materiality analyses were not found for Uranus, thus presenting a potential opportunity for further sustainability integration. Describing the materiality analysis process, the Head of Strategy at Jupiter stated, "We worked with Helios on material analysis and trying to set what differentiating factors Jupiter should focus on." Tailoring sustainability strategies to individual unit needs is crucial, and this approach underscores its importance. Similarly, the Head of Business Development at Neptune stated, "We started the materiality assessment where we found the different aspects that we want to focus on, and for every aspect, we have 12 aspects. We have someone from the management team in charge or responsible for [each aspect]." This clear delineation of responsibility is crucial for ensuring accountability and follow-through in sustainability initiatives. For Jupiter, materiality analysis helped integrate sustainability into practice. Business Developer 2 at Jupiter stated, "We are getting it [sustainability] into the business plan for the company, and we are going to regularly focus on these [sustainability] aspects that we have identified in the materiality analysis." Saturn also perceived materiality analysis as a form of learning:

> "I will say that with this project [materiality analysis] that we are doing now with [Head of Sustainability at Helios] we are learning a lot of along the way. We are doing all these interviews internally but also getting

feedback from [users] and what the expectations are for Saturn. So, we are in the middle of learning."

(Director of Consumer Business at Saturn).

This approach represents a shift towards a more inclusive sustainability model that aligns both internally and externally with stakeholders.

Neptune collaborated with Helios' Sustainability Department to publish a sustainability report, while Saturn obtained Environmental Lighthouse certification. In a conference paper, we explain how Neptune governs its sustainability goals (Ademi & Klungseth, 2023). For Neptune, publishing a sustainability report was not just a procedural task but also a significant learning opportunity, fostering strong organizational enthusiasm for sustainable practices. Similarly, the certification process prompted a profound internal examination of Saturn's practices. The CEO of Saturn said, "We examined our own practices and identified ways to sort waste and become more climate-neutral." In contrast, Uranus focused primarily on reducing its CO2 emissions. The Strategic Director at Uranus stated, "We see from our customers in e-commerce a strong drive to convert to emission-free [services]." Beyond cutting CO2 emissions, their sustainability activities were minimal.

Helios engaged over 3,500 stakeholders to identify critical sustainability concerns, facilitating stakeholder dialogue as part of their learning-by-doing. Stakeholder input helped determine the relevant sustainability areas to focus on. The four business units also underwent stakeholder analysis. Neptune's Project Manager for Strategy and Business Development discussed their work in defining relevant sustainability areas, stating that the initial step in working toward sustainability was "to talk to different stakeholders on what would create more impact to them given the company profile and the industry Neptune operates in." Embedding a stakeholder perspective into their sustainability approach ensured relevance and resonance with stakeholder needs and expectations.

Helios used business case studies to learn about sustainability and how businesses can address it. The Sustainability Department at Helios selected these cases, mainly internal ones, and showcased examples from Helios and other organizations to demonstrate the integration of sustainability into business operations. They also used business cases from university courses they attended. Referring to case studies, the Head of Sustainable Business Development at Helio stated, "Find good cases so you can explain [sustainability] with ... what is the best [sustainability] case within Helios ... So, cases for teaching people and bringing maturity." The cases were particularly influential in Saturn, where they were used to deepen knowledge, identify sustainability-linked business opportunities, and overcome managerial resistance to sustainability initiatives. As emphasized by the Head of Sustainable Business Development at Helios, case studies offer a practical way to incorporate sustainability into an organization's culture. This approach recognizes that successful sustainability implementation requires not only policy changes but also a change in mindset and behavior at the organizational level.

4.1.2 | Knowledge acquisition

Knowledge acquisition is the acquisition of new knowledge from external sources (Fortis et al., 2018). Helios and its business units acquired knowledge from external sources, including universities, research centers, and international standards.

First, the Sustainability Department strategically recommended university courses on sustainability for management teams and business units. The aim was not just to gain theoretical knowledge but also to cultivate new competencies in sustainability and foster innovation in sustainability within business units. For instance, a business developer at Jupiter now dedicates part of their time to work on sustainability. She stated:

I took a course at Cambridge University about sustainable business development. There, I did the materiality analysis for Jupiter as a case, which gave me a new job in Jupiter. So, now I am also working to help the management team in Jupiter in their sustainability efforts. So, I am 50% on the innovation team and 50% on sustainability.

(Business Developer at Jupiter)

The Jupiter case exemplifies how educational initiatives can drive organizational change, resulting in the creation of new sustainability-focused positions. Similarly, the Director of Consumer Business at Saturn said that a team member became a sustainability manager after attending the same Cambridge course. She stated that sustainability is "becoming a way of how we work, but maybe this [acquiring knowledge and having a sustainability manager] will again outline a more structured way of working with it." The expected outcome was to have a more structured approach to sustainability and integrate it into the business model. This is an example of Helios acquiring knowledge from universities and integrating it into their organizations. However, not all business units have participated in these courses. At the time of our interviews, Uranus and Neptune did not have any people who attended these courses.

Second, Helios and its business units bring in external experts to discuss sustainability topics. For example, Saturn organizes hub days annually to learn about various topics including sustainability. Elaborating on these activities, one of our informants stated:

[On our hub days], we present cases that have been done, and external people come in and talk about stuff. In Spring 2020, it was all about understanding climate change, so we had some researchers from a research center come and explain how we know this is man-made stuff.

This approach was led by their company leader, who is passionate about sustainability. Hub days are not only meant for acquiring knowledge but also for encouraging a culture of learning and engagement with present sustainability challenges. We identified a similar

approach used by Jupiter and Neptune. By contrast, Uranus did not invite experts to address sustainability.

Third, adopting international standards, Helios and its business units implemented international sustainability practices, frameworks, and recommendations, such as the Task Force on Climate-related Financial Disclosures (TCFD), Global Reporting Initiative (GRI) Standards, and Sustainability Accounting Standards Board (SASB), to address sustainability. These standards charted their course towards achieving sustainability and were used to set sustainability goals and targets. Referring to TCFD, the Sustainability Manager at Helios stated, "The TCFD report has been really good in helping us understand the risk that is hitting our business models and also seeing, OK, where do we need to adapt? Where do we need to go?" Helios and Neptune have further published sustainability reports that comply with international standards. Helios' sustainability report states that they have used "recommendations on sustainability reporting (GRI Standards and Sustainability Accounting Standards Board (SASB))."

Helios and its business units have adopted a multifaceted approach to acquire sustainability knowledge. This demonstrates comprehensive and proactive engagement with external knowledge sources. However, the degree of engagement varies across units, reflecting differing levels of integration and application of sustainability practices. This highlights the importance of not only acquiring knowledge but also integrating and acting upon it within organizational structures and strategies.

4.1.3 | Collaborative learning

Collaborative learning refers to co-learning with value-chain partners or external stakeholders (Fortis et al., 2018). Our cases involve collaboration with value chain partners to enhance their understanding of sustainability. Through stakeholder dialogue, they gathered input and perspectives from partners, thereby increasing their knowledge of the subject. Stakeholder dialogue was a vital factor in expanding sustainability comprehension, as stakeholders frequently aided in discerning sustainability facets that would have been challenging to recognize independently. This observation was consistent across the various cases. Highlighting the importance of collaborating with stakeholders, the Head of Sustainable Business Development at Helios said that the most important questions are "How do we involve stakeholders? How do we understand the stakeholders and let them guide us?" This represents a shift from one-way information sharing to interactive mutual learning with stakeholders. Neptune's Partner Responsible Manager stressed the need for partners' buy-in on sustainability and understanding the need for sustainable business models, indicating that sustainability is not just an internal goal for Neptune, but a shared value across the supply chain. The Business Unit Manager at Jupiter highlighted the potential impact on the partners' business models as they integrate sustainability into their practices. More specifically, he stated:

> If we are then building up new things [integrating sustainability] that damage their sales, we are not such good friends anymore … to be honest, I have a meeting later today where I am meeting a big [partner] that is challenging us, like 'hey why are you doing this?'
>
> (Business Unit Manager at Jupiter).

As Jupiter works to integrate sustainability into its business model, it also requires business partners to understand how sustainability impacts their sector and why changes may be necessary. Similarly, Helios and its business units recognize the need to learn together with business partners to address sustainability.

Helios and its business units partnered with external organizations to conduct sustainability-focused analyses. They evaluated the impact of their business activities using the second-hand effect method, which measures waste reduction by facilitating the use of second-hand goods. The goal was to bring specialized knowledge and create a space for learning. Helios, Jupiter, and Uranus collaborated in these assessments to identify the areas in which they had the most significant impact on sustainability. A Senior Project Manager at Jupiter stated, "There is the second-hand effect we are giving society, but it will also be an economic value proposition for our users. To buy secondhand is cheaper than buying new, which is also an economic benefit." Collaboration with external stakeholders allowed the three business units to learn and develop their internal capacities to address sustainability. It also provided insights into their impact on societal sustainability. The Senior Product Manager at Uranus reported unlocking new services and products by understanding the business' second-order effects on sustainability. Thus, offering the potential to implement a circular economy for Jupiter and Uranus indicates a transition from conventional sustainability practices to innovative system-level changes.

4.2 | Knowledge retention

Knowledge retention refers to the storage of created and acquired knowledge for future use (Walsh & Ungson, 1991). To retain knowledge about sustainability within an organization, our cases embody it in individuals and organizational routines.

4.2.1 | Knowledge embedded in individuals

Individuals at Helios are critical for retaining their knowledge of sustainability. The Sustainability Department serves as the resource for sustainability-related tasks. The studied business units within Helios recognized the value of the department, which provides the necessary knowledge, experience, and approaches to support others in addressing sustainability.

Within the business units, individuals act as knowledge repositories. The leader of Saturn embodies sustainability, and she is often

referred to as "the ambassador for sustainability," embodying the values and practices of sustainability. Similarly, the Head of Strategy at Jupiter leads sustainability work and strategic development, demonstrating the harmonious integration of sustainability and business strategy. Neptune has also appointed a sustainability manager to promote sustainability and has established a sustainability community, showing a structured approach to institutionalizing sustainability roles within the unit. Uranus did not have a person responsible for sustainability.

Graduates of the university courses at Cambridge and the internal sustainability training program act as knowledge repositories within each business unit. They support the implementation of sustainability at the operational level, understand Helios' sustainability strategy, and help implement it in the organization. Explaining the role of these ambassadors, the Commercial Director at Jupiter stated:

> We have had an educational program with people from every team participating and then being ambassadors. This is contributing to driving the change. Now I see that one of the ambassadors in the management team of Jupiter is debating these [sustainability-related] questions and helping us move forward with a goal-oriented way of approaching these issues.
>
> (Commercial Director at Jupiter).

The ambassadors' participation in management decisions reflects a proactive and goal-oriented approach to integrating sustainability into the business model. Such graduates were present only in Helios, Jupiter, and Saturn. For example, in Jupiter, one graduate worked 50% on sustainability, while in Saturn, two were involved in sustainability work.

Individuals play a crucial role in the integration and implementation of sustainability practices by acting as knowledge repositories and advocates. Sustainability teams, communities, and trained individuals not only retain knowledge but also help create organized knowledge systems while internalizing the incorporation of explicit knowledge into tacit forms. Moreover, they form dynamic networks that enable the application of the acquired knowledge to operational and strategic initiatives.

4.2.2 | Knowledge embedded in routines

Helios has established sustainability routines and SOPs, aiming to make sustainability an integral part of its organizational culture. They have developed processes to identify sustainability opportunities and risks, involve stakeholders, conduct materiality analyses, and identify relevant sustainability goals and targets. Integral to these processes are documents and policies, such as a sustainability strategy, sustainability pyramid, sustainability framework, due diligence checklist, sustainability guide for assessing investments, and sustainable investment policy. These aim to incorporate sustainability into their business development. For instance, the sustainable investment policy

aims "to set out Helios' strategic orientation and approach to sustainable investments throughout our investment process." The EVP of Neptune Industry mentioned sustainability due diligence and stated, "We have a framework for doing sustainability due diligence before we invest. We aim to start tracking our portfolio investments and injecting sustainability into the overall framework for putting our resources to work." These documents are available to all business units. Such formulated policies articulate Helios' strategic orientation towards sustainable investments throughout its investment process, acting as a means for Helios to achieve more sustainable business models.

Helios started implementing these SOPs throughout the organization, affecting new organic investments, assessment of acquisition targets, assessment of business partners, hiring policies, and other areas. Moreover, Helios introduced sustainability-related practices to new hires during their onboarding process. Impressed by his exposure to sustainability during the onboarding process, the Chief Investment Officer at Helios said:

> I was onboarded by getting our sustainability policy and the written approach to sustainable investments. Then, I had a meeting with the sustainability team, where we talked through it and had a bit of a Q&A to ensure I understood it.
>
> (Chief Investment Officer at Helios).

Such an onboarding experience aims at making sustainability very clear to new employees and an integral part of the corporate culture.

All four business units referred to Helios' sustainability strategy. However, Jupiter and Neptune took a few more steps than the others, indicating variations in the depth of sustainability integration across the business units. Their business model includes partnerships with other businesses. Therefore, as part of evaluating their partners, they seek sustainability parameters. Elaborating on this, the Head of Business Development at Neptune stated:

> When we sign new partnerships with businesses, we have included a few questions in the checklist: Are they engaged in sustainability activities? Do they have a sustainability plan or sustainability person? We have many questions to understand what commitment they have toward sustainability.
>
> (Head of Business Development at Neptune).

Similarly, Jupiter has applied these SOPs to assess their investments and partnerships. In contrast, Saturn and Uranus do not apply them.

As part of its SOPs, Helios has incorporated multiple international standards and frameworks, including the established GRI and SASB guidelines, which are periodically utilized in the preparation of sustainability reports. By adhering to such "soft-law mechanisms," they were able to adopt sustainability practices and learn concrete mechanics for integrating sustainability into their work. Recognizing the significance

of these standards, the Head of Sustainable Business Development at Helios stated, "I am schooled in using GRI standards. That is a great framework for pointing out ambitions and targets and the right direction for a company." Helios continues to adopt similar standards, with the recent implementation of TCFD recommendations in 2022. These standards have been made available to all business units, although the Sustainability Department at Helios serves as a resource for their application, suggesting a centralized approach to sustainability expertise within Helios.

4.3 | Knowledge transfer

Knowledge transfer describes the transfer of created and acquired knowledge within and across organizations (Argote & Ingram, 2000). Helios also focuses on transferring knowledge internally within the company and externally to different stakeholders. The Sustainability Department operates this process at the corporate level, whereas business units are responsible for transferring knowledge to their departments and branches. They have utilized training programs, workshops, and sustainability-related pilot projects.

4.3.1 | Training programs and workshops

In 2020, the Sustainability Department launched a sustainability training program, which serves as a vehicle for disseminating knowledge on sustainability across business units. These internal training programs are an effective and easy means of transferring knowledge and exemplify the organization's systematic approach to spreading sustainability knowledge. Every year, a cohort of employees from various business units participate in this program. Elaborating on the program's aim, the Head of Sustainable Business Development stated:

> The program started in 2020 to take sustainability out to all organizations and engage people around this topic. … [The purpose of this program is] to take the resources that know more about Helios and our brands and give them a pair of sustainability glasses and perspective in their daily work. So, the purpose is to provide knowledge, work across borders in all our operating countries, and get people to know each other while adding sustainability to them and the organization.
>
> (Head of Sustainable Business Development at Helios).

Graduates act as sustainability ambassadors within their business areas and units, representing "knowledge reservoirs" that enable knowledge transfer across the organization. They bring a sustainability perspective into business discussions and often challenge others to incorporate sustainability into business development. Graduates are the singled-out experts positioned throughout the organization who are expected to share and expand their knowledge with others in their

respective departments. The CEO of Uranus mentioned this training program to educate employees on sustainability.

At the business unit level, Neptune attempted to push sustainability across the organization across multiple countries and translate it into the local contexts in which Neptune operates. Elaborating on this, the Partner Responsible at Neptune stated:

> We assign responsibilities in different countries to identify how we could align what we are doing in the local market with the overarching goals of Neptune. Then, there is still some room locally to do things that make sense in a local context.

Because addressing sustainability may differ from country to country, Neptune allows local teams to embrace the local context in which they operate. Embracing the local context is a form of employee empowerment in applying and adjusting sustainability knowledge to various local contexts. Thus, their branches across countries contribute to overall sustainability while maintaining local flexibility to fit the context of their countries of operation. Jupiter, Saturn, and Uranus did not make such efforts.

Helios organized a series of workshops and meetings to share knowledge across the organization. The executive team was the focus of these workshops, helping them understand sustainability and set appropriate goals and targets. The executive team is crucial in leading the three business areas, and can effectively drive sustainability efforts down to the business units within their areas. The workshops by Helios were effective knowledge transfer mechanisms for both executives and managers. Many informants from the executive team stated that these workshops helped them understand sustainability better. Helios' Sustainability Department conducted similar workshops with business units to help them gain a broader understanding of sustainability. Attendees found these workshops highly beneficial. Across Saturn, workshops on sustainability are referred to as "eye-openers" to understanding what sustainability means. For instance, the Senior Product Manager at Saturn stated, "I have thought of sustainability more like environmental impact, like reducing our carbon footprint, but now I understand that it is a broader field than that. So again, that has been an eye-opener for me." Thus, the organization's awareness of sustainability has increased, and it is an increasingly important part of managerial discussion.

Sustainability communities represent a unique form of knowledge transfer. Neptune created a sustainability community that encourages all employees to participate in discussions related to sustainability. The community also facilitates the initiation and development of new business opportunities that arise from sustainability. Regarding the community, a Data Security Specialist at Neptune explained:

> What is good about the sustainability community is that it is a Neptune community, so we have people from all the entities. … We try to identify the sustainability actions we can roll out everywhere and which ones are more targeted for one market than another.
>
> (Data Security Specialist at Neptune)

This employee-driven initiative aims to foster learning, discussions, and work on sustainability. Sharing and exchanging tacit knowledge through collective experience illustrates the socialization component of knowledge creation. Saturn has also implemented a similar initiative, with the CEO promoting environmental sustainability. Although voluntary participation was sometimes limited, our informants credited the CEO for improving their understanding. The low level of voluntary participation observed in these initiatives indicates the need to enhance employee engagement. In contrast, Uranus and Jupiter have yet to adopt such initiatives.

4.3.2 | SOPs and international standards

The development of SOPs related to sustainability and the adoption of international standards primarily occurred within Helios rather than within individual business units, illustrating a centralized approach to sustainability management. The Sustainability Department at Helios took the lead in initiating and creating sustainability SOPs, which were then shared throughout the organization. For example, the sustainability strategy, sustainability pyramids, and sustainability investment policy were designed by the Sustainability Department at Helios and shared and implemented across all four business cases, enabling them to better comprehend the sustainability implications of their investments. They also designed customized SOPs and guidelines for specific business units. For instance, the Head of Sustainable Business Development at Helios shared a unique theme-specific sustainability guide they developed for Jupiter, elaborating on the main sustainability opportunities, risks, and most relevant SDGs. Such a guide was crucial for Jupiter in understanding sustainability opportunities, risks, and SDG and how they impact Jupiter's investments. Additionally, the department shared materiality analysis guidelines with the business units and guided them throughout the process. For example, the Head of Strategy at Jupiter mentioned that the department had worked with its team on material analysis to identify the key differentiating factors that Jupiter should focus on. This collaborative approach to identifying sustainability aspects for each unit demonstrates the effectiveness of integrating sustainability into their strategic planning. Similar instances were found in Saturn and Neptune but not in Uranus.

4.4 | Summary of the five cases

Helios empowers the sustainability team to lead sustainability. The CEO established the sustainability team as change agents, provided them with support, and urged them to challenge the status quo. The team created an emergency around sustainability. They developed knowledge creation/acquisition, retention, and transfer mechanisms. Helios has been pivotal in transferring knowledge to business units and assisting them in their sustainability work.

Saturn has actively worked to enhance the understanding of sustainability. Saturn's leader has been vital and is referred to as the "sustainability ambassador." They acquire knowledge from external sources and transfer it across the unit. They have also developed staff to work on sustainability.

Jupiter was actively engaged in the learning process. It dedicated resources to creating/acquiring new knowledge and developing staff dedicated to sustainability, who constantly pushed sustainability into the business agenda. Collaborating with units within Helios and external partners helped identify business opportunities for sustainability. This reinforced their dedication to sustainability.

Uranus lagged in the sustainability learning process compared with the other units. Apart from a few initiatives led by Helios, Uranus has not yet performed independent learning activities. It did not have a leader willing to put sustainability on the agenda. Operating in a low-margin industry, Uranus focused on financial performance, but not on sustainability beyond reducing CO_2 emissions in its logistics. Interestingly, Uranus faced a substantial blow when a major business client dropped them for not being green.

A summary of the learning activities performed by each unit is presented in Table 3.

As shown in our analysis, *Neptune* was the leading business unit in terms of sustainability, appointing a sustainability manager, establishing a community to discuss sustainability, and publishing sustainability reports. This has resulted in strong enthusiasm for sustainability in the unit. Neptune transferred its sustainability competency to its branches and adapted it to the local context. It is important to note that operating in a highly regulated financial industry pushed Neptune to work toward sustainability.

5 | DISCUSSION

This study investigated how organizations learn about sustainability, elaborating on the learning process to enhance understanding of sustainability. Our findings resonate with those of several other studies investigating the nexus between sustainability and OL, while expanding on the practical aspects of learning for sustainability. For example, as in existing studies (e.g., Wijethilake & Upadhaya, 2020), our findings indicate that businesses lack a proper understanding of sustainability and that OL is a strategic capability that helps companies face an ever-changing environment. Unlike previous studies, we focused on the learning process and identified concrete learning mechanisms—knowledge creation, retention, and transfer—employed to facilitate learning, contributing to empirical research on the practical learning mechanisms that drive business practices (Hermelingmeier & von Wirth, 2021). Our findings have important theoretical implications for sustainability and OL. By further conceptualizing the relationship between learning principles and sustainability transitions, our findings highlight the crucial role of OL in sustainability transitions and the development of sustainable business models. We provide a theoretical framework for advancing sustainability knowledge within organizations and contribute to the research on the intersection of OL and sustainability. Moreover, our analyses of the learning mechanisms that enable sustainability learning in a business setting offer insights into the specific triggers and structures that facilitate this learning process.

TABLE 3 Summary of the findings.

		Helios	Saturn	Jupiter	Uranus	Neptune
Knowledge creation/acquisition	Learning by doing	• Materiality analysis • Impact assessment • Stakeholder dialogues • Assessment of sustainability risks and opportunities • Setting sustainability goals • Designing internal sustainability policies • Case studies	• Materiality analysis • Impact assessment • Setting sustainability goals • Environmental certification • Case studies	• Materiality analysis • Impact assessment • Setting sustainability goals sustainability workshops	• Setting CO_2 targets	• Materiality analysis • Impact assessment • Stakeholder dialogues • Assessment of sustainability risks and opportunities • Setting sustainability goals • Sustainability workshops • Sustainability community
	Knowledge acquisition	• Enrolling in university courses • Inviting subject experts • Applying international standards • Internal training	• Enrolling in university courses • Inviting subject experts • Applying international standards • Internal training • Collaborating with research centers	• Enrolling in university courses • Inviting subject experts • Applying international standards • Internal training	• Internal training	• Enrolling in university courses • Inviting subject experts • Applying international standards • Internal training
	Collaborative learning	• Collaborating with business partners • Collaborating with research institutes • Collaborating with business units • Attending conferences	• Collaborating with research institutes	• Cooperating with business partners • Collaborating with research institutes • Collaborating with business units	• Cooperating with business partners • Collaborating with research institutes • Collaborating with business units	• Cooperating with business partners
Knowledge retention		• Sustainability team • Establishing routines • Setting processes: Hiring and onboarding process • Developing sustainability strategy, sustainability pyramid, investment policies, frameworks, due diligence documents, checklists, and tools • International standards and frameworks • Sustainability ambassadors	• Sustainability strategy • Sustainability pyramid • International standards and frameworks • Sustainability ambassadors	• Sustainability strategy • Sustainability pyramid • Sustainability due diligence • Sustainable investment policy • International standards and frameworks • Sustainability ambassadors	• Sustainability strategy • Sustainability ambassadors	• Sustainability strategy • Sustainability due diligence • Sustainable investment policy • International standards and frameworks • Sustainability ambassadors • Sustainability checklists separate from the mother company • Sustainability manager • Sustainability community

TABLE 3 (Continued)

	Helios	Saturn	Jupiter	Uranus	Neptune
Knowledge transfer	• Training program • Sustainability ambassadors • International standards and frameworks • SOPs • Designing customized sustainability guides for business units • Workshops • Pilot sustainability projects • Sustainability report • Other sustainability reports • Conference talks	• Sustainability ambassadors • International standards and frameworks • SOPs	• Sustainability ambassadors • International standards and frameworks • SOPs • Sustainability impact report	• Sustainability ambassadors	• Sustainability ambassadors • International standards and frameworks • SOPs • Sustainability report • Sustainability community

These findings can help organizations shift their perspectives towards sustainability and contribute to the development of existing theories on sustainability learning.

Overall, our study provides valuable insights into the mechanisms that promote sustainable practices in business settings, which can be helpful for developing effective sustainability strategies and sustainable business models. Our study builds upon the "key learning principles for shifts in organizational perspectives, that is, business transformation," identified by Hermelingmeier and von Wirth (2021, p. 1847) to expand on specific learning methods that facilitate sustainability learning. By doing so, we respond to calls for further research on learning strategies and mechanisms to operationalize sustainability learning (Fortis et al., 2018; Hermelingmeier & von Wirth, 2021; Quartey & Wells, 2020). Specifically, our findings provide empirical evidence for developing a framework to help businesses operationalize OL to achieve a better understanding of sustainability through OL. Our framework generates a detailed list of OL activities, prioritizing high-priority tasks at the top and arranging the remaining tasks in descending order. In doing so, we offer practicalities for implementing sustainability learning in a company setting and offer an empirical analysis of the learning mechanisms. Our data analysis reveals the order of activities, and while we recognize the absence of established criteria for ordering, our goal is to offer practical guidance to practitioners and scholars as they operationalize OL to achieve sustainability knowledge. The framework is presented in Table 4 and discussed below.

Based on the literature on OL and sustainability, we created a conceptual model that demonstrates how the OL process can be used to generate knowledge related to sustainability. The model identifies three key stages in the OL process: knowledge creation and acquisition, knowledge transfer, and knowledge retention. We then applied this conceptual model to case studies to identify the learning strategies and mechanisms that can be used to operationalize the learning process. The findings of these case studies are discussed in detail in the following sections.

5.1 | Knowledge creation/acquisition

Our research shows that organizations can generate sustainability knowledge through three pathways: engaging in sustainability-related activities, acquiring knowledge from external sources, and collaborative learning. Our study contributes to existing research by revealing specific learning mechanisms that enable sustainability learning. By participating in activities such as stakeholder dialogues, materiality analysis, sustainability impact assessments, and setting sustainability goals, organizations can generate and disseminate new knowledge on sustainability within the organization. These initiatives offer experiential learning opportunities that enable the testing and refinement of ideas into practical applications while embedding sustainability principles into an organization's core beliefs and values. It is widely recognized that experiential knowledge is not easily transferable or duplicated from one person to another (Barley et al., 2018). It is

TABLE 4 A detailed framework to help businesses operationalize OL to achieve sustainability knowledge.

	Knowledge creation/acquisition			Knowledge retention		
	Learning by doing	**Knowledge acquisition**	**Collaborative learning**	**Embedded in routines**	**Embedded in individuals**	**Knowledge transfer**
Activities	• Materiality analysis • Impact assessments • Assessment of sustainability risks and opportunities • Stakeholder dialogues • Setting sustainability goals and targets • Designing internal sustainability policies • Sustainability certifications • Case studies • Sustainability community • Sustainability workshops	• Applying international standards - task force on climate-related financial disclosures (TCFD), global reporting initiative (GRI) standards, and sustainability accounting standards board (SASB) • Internal sustainability training • Enrolling in university courses • Inviting subject experts	• Cooperating with business partners • Collaborating with research institutes • Internal collaborations among business units • Attending conferences	• Establishing routines • Setting processes: Hiring and onboarding process • Developing sustainability strategy, sustainability pyramid, investment policies, frameworks, due diligence documents, checklists, and tools • Adopting international standards and frameworks	• Sustainability team • Sustainability ambassadors • Sustainability community	• Sustainability training program • Sustainability ambassadors • Sustainability workshops • International standards and frameworks • SOPs • Designing customized sustainability guides for business units • Pilot sustainability projects with business units, departments, and groups • Sustainability community • Sustainability report • Other sustainability reports • Conference talks

important to consider the context and complexities of how things are perceived and how their benefits are achieved. Stakeholder dialogue enables organizations to adopt an outside-in perspective and comprehend a broader range of sustainability-related implications stemming from their business practices. This process helps identify sustainability challenges that can potentially lead to new opportunities for business development and integrate the needs of a broader range of stakeholders. Similarly, organizations conducting internal analyses and assessments can break down their value chains to emphasize aspects that truly matter to their sustainability efforts. Our study further reveals that analyzing what matters involves evaluating the value chain, mapping out stakeholders, recognizing various sustainability factors, and determining which factors are crucial for an organization's sustainability. We found that pursuing sustainability-related certification facilitates organizations in acquiring new knowledge and integrating sustainability principles into their business practices.

Individuals competent in sustainability, typically located in the sustainability department, are responsible for challenging the business-as-usual approach, integrating sustainability, initiating sustainability activities, and conducting assessments within organizations. It is important to have these individuals as internal staff rather

than relying on external consultants to drive specific sustainability initiatives, as integrating sustainability into business practices requires persistence and internal ownership. Furthermore, engaging in learning-by-doing initiatives aligned with international standardization bodies' guidelines and practices allows involved individuals to deepen their understanding of sustainability and provides a structured framework for carrying out initiatives and associated tasks.

To enhance their understanding of sustainability, organizations must not rely solely on learning-by-doing. Instead, they should adopt international standards and frameworks, conduct internal sustainability training, encourage employees to take sustainability courses, and invite experts to speak to employees. Our study found that external sources such as international standards, frameworks, and guidelines are critical for understanding sustainability. These are "soft-law mechanisms" that aid businesses in adopting sustainable practices (Fortis et al., 2018). By adhering to these frameworks and standards, organizations can learn concrete mechanisms for integrating sustainability into their work. Additionally, business practitioners can expand their sustainability knowledge and methods of integrating sustainability into their business development work by enrolling in university courses on sustainability and sustainable business development. This

is particularly beneficial for senior individuals without prior access to sustainability education. Our study also suggests inviting sustainability experts to speak to companies, as these experts may bring unique knowledge, experience, and case studies that can inform and inspire organizations.

Finally, collaborating with partners and stakeholders helps create and acquire knowledge, particularly for complex challenges. Our study highlights the importance of collaborating with business partners throughout the value chain to address sustainability challenges practically. Engaging with business partners can be highly beneficial as they often possess valuable knowledge and expertise in sustainability. Additionally, collaborating with research institutions brings unique sustainability-related expertise that may fall outside an organization's knowledge base. Such collaborations may result in the formation of official partnerships with specialized institutions, fostering a space for learning and obtaining knowledge that may not be generated internally. Attending sustainability conferences can help identify relevant institutions to partner with. Furthermore, collaborations among business units can establish an inter-firm learning network. Such collaborations entail pooling resources to identify and comprehend sustainability risks and opportunities, sharing knowledge and experiences, and supporting one another in launching sustainability initiatives. Our findings demonstrate that such collaborations can spur innovative business solutions by addressing sustainability challenges. In summary, our analysis shows that integrating sustainability into business and aiming to solve sustainability challenges often require a systems perspective involving other parties.

5.2 | Knowledge retention

Organizations should embed sustainability into individuals to retain their knowledge of sustainability. This helps increase the human capabilities to drive sustainability, disrupt the status quo, and bring sustainability into business discussions. Individuals can also act as ambassadors and trusted sources of consultation regarding sustainability-related concerns. To achieve this, we recommend establishing sustainability teams to push for the integration of sustainability, educating more sustainability ambassadors, and creating sustainability communities or forums. These sustainability teams and ambassadors help cultivate a stronger culture and sustainability logic in the organization, while communities serve as mediums to help individuals learn about sustainability, exchange knowledge, and spark new business development ideas rooted in sustainability.

Routines and SOPs, such as sustainability-related policies, procedures, guidelines, and practices, help organizations adopt sustainable practices by facilitating learning (Feldman & Pentland, 2003). These policies effectively embed sustainability into business practices by incorporating it as a crucial criterion in decision-making, such as selecting business partners and investments. For instance, including sustainability in the onboarding process of new employees conveys a clear message about the organization's commitment to sustainability. Indeed, our research shows that placing sustainability at the core of

the hiring process can provide a competitive edge in attracting young talent, as younger generations seek opportunities to contribute to a more sustainable society. Organizations accomplish their objectives through routines and SOPs. Our findings also show that adopting international standards is another effective way to operationalize and embed sustainability into business practices.

However, such retention mechanisms tend to involve more single-loop than double-loop learning. They present more changes in the organization's minor routines rather than questioning its business model. This adds to the organization's knowledge base but does not make significant changes (Argyris, 2002). Abductively, we conjecture (Sætre & Van de Ven, 2021, 2024) that this can be due to two reasons. First, they add more knowledge on a need-to-know basis as they are confronted with various sustainability challenges, and their license to operate is threatened. Second, challenging an organization's fundamental design may require more time, and they are only in the early stages of learning. The single-loop learning process they are going through ensures a common knowledge base to rely on when entering double-loop learning processes such as developing sustainable business models.

Knowledge retention occurs at the corporate and business unit levels. Knowledge is often created and retained at the corporate level and then transferred to business units. Our findings show that business units operating in multiple countries must adopt knowledge retention mechanisms to fit the local context. In many countries where the awareness of sustainability is low, it may often be difficult for organizations to impose sustainability criteria on their SOPs, for instance, in business partnership selection or investment criteria.

5.3 | Knowledge transfer

To improve understanding of sustainability across business units, organizations can engage in training programs, develop sustainability ambassadors, establish international standards and frameworks, design customized sustainability guides, and implement pilot projects within units. These initiatives facilitate the internal circulation of knowledge and improve knowledge bases in receiving units (Argote & Ingram, 2000). The sustainability department in the mother organization plays a crucial role in transferring knowledge to business units, groups, and individuals. Their presence provides an organizational structure that facilitates learning, knowledge sharing, and integration. Our analysis indicates that sustainability teams hold the paramount responsibility of keeping pace with the latest sustainability practices, developing new strategies, and ensuring that the rest of the organization learns and adopts these practices.

Our study recommends that companies, specifically sustainability teams, conduct internal training programs to educate sustainability ambassadors in various business units. These programs focus on sustainable business practices and certify attendees as sustainability ambassadors. The ambassadors' role is to advocate sustainability within their respective business units. Attendees may hold positions across different business units and voluntarily allocate a

portion of their time to the program. Once certified, these individuals become sustainability ambassadors to their business units or groups. They help to integrate sustainability perspectives into their respective domains. Our analyses show that multinational corporations benefit from having more ambassadors as they enhance sustainability knowledge. These ambassadors play crucial roles in the learning process. Offering such training programs to organizations, business units, or departments has two purposes. First, it retains sustainability knowledge among individuals. Second, it facilitates the dissemination of sustainability knowledge across the organization. These programs serve as a means of acquiring knowledge for business units or departments participating in the training sessions.

Our study suggests that workshops should be conducted to transfer sustainability knowledge to business units, groups, and individuals. Sustainability departments, teams, or individuals with expertise in specific aspects of sustainability can conduct these workshops. To share knowledge on sustainability effectively, we recommend supporting business units in implementing international standards, frameworks, and internally developed SOPs. This may require creating tailored guidelines and procedures for each unit. The sustainability department plays a pivotal role in this regard. Participating in hands-on sustainability-related projects and initiatives along with other business units and groups allows for knowledge transfer. Finally, organizations can prepare sustainability reports, conduct stakeholder dialogues, and participate in sustainability-related initiatives, such as conferences and expert talks on sustainability, to externally diffuse knowledge.

5.4 | Practical implications

The findings of this study have important managerial implications for firms seeking to advance their sustainability knowledge. Managers should prioritize a combination of learning-by-doing, knowledge acquisition from external sources, and collaborative learning to increase the workforce' s awareness of sustainability. This process helps them understand where they can make the largest contribution to sustainability. Furthermore, firms should prioritize stakeholder dialogue to gain an outside-in perspective on the sustainability implications of their business activities. To facilitate learning-by-doing, managers can adapt relevant international sustainability international standards that offer frameworks, roadmaps, and guidelines to identify their sustainability goals and targets, report on them, and assess and disclose their sustainability implications. Moreover, firms and managers should explore external sources, such as universities, specialized research institutes, conferences, and experts, to acquire new sustainability knowledge. By following these recommendations, firms can enhance their sustainability knowledge, build a more engaged and aware workforce, and demonstrate their commitment to sustainability to their stakeholders.

The managerial implications of our study suggest that firms seeking to retain and advance sustainability knowledge within their organizations must establish sustainability routines, policies, and frameworks, along with adopting international standards. These

efforts allow firms to set "recognizable patterns of independent actions carried out by multiple actors" (Feldman & Pentland, 2003, p. 95), leading to sustainability knowledge advancement. Firms should prioritize developing sustainability-competent teams and individuals to act as knowledge repositories, helping retain and advance sustainability knowledge across the organization. To facilitate this process, firms should establish sustainability communities within the organization, serving as hubs for creating, retaining, and sharing knowledge.

Finally, our findings support firms and managers in transferring created and acquired sustainability knowledge across the organization, including business areas and business units. To achieve this, firms could establish training programs that enroll participants from various departments and business units who, upon graduation, would serve as sustainability ambassadors in their respective departments and units. Additionally, creating sustainability communities that invite individuals from across the organization to participate can aid in knowledge transfer. It is also recommended that successful SOPs be translated to other units and departments. Finally, establishing sustainability teams can be highly beneficial for organizations, as they are instrumental in initiating sustainability activities and projects and involving the rest of the organization.

6 | CONCLUSION

This study explored how organizations learn about sustainability from an OL perspective. Following the OL process—knowledge creation/acquisition, knowledge retention, and knowledge transfer—we focused on the practicalities of the learning process, which have often been overlooked in the existing literature. Based on a multiple-case study research approach, we offer empirical insights into the learning mechanisms that drive business practices to enhance the understanding of sustainability. Specifically, we propose a framework for business practitioners that offers guidance on operationalizing OL to better understand sustainability. The proposed framework offers a set of strategies and methods for creating and acquiring new knowledge; sharing it across the organization's business units, departments, and individuals; and embedding it in routines and individuals. Our study extends the existing OL and sustainability literature by responding to a body of literature that suggests exploring and revealing the practical aspects of fostering learning for sustainability. For business practitioners, it provides a set of strategies and approaches for achieving sustainability knowledge.

This study has a few limitations that offer avenues for further research. First, although our case study includes one conglomerate and four business units operating autonomously in different industries, investigating the learning process in multiple independent companies would further enhance the generalizability of the findings. Future research should address this research question using a multiple-case study design with a larger sample size outside the conglomerate context. Second, descriptive data and narratives were used. Considering that "what people perceive happens in their organizations may not really happen the way they see them" (Daly et al., 2012,

p. 28), future studies should employ both ethnographic and survey methods. Third, our study focused on the learning process and identified learning mechanisms, rather than their effectiveness. We invite researchers to test the proposed framework, assess its effectiveness, and further advance it. Similarly, we invite researchers to replicate the learning approach presented in this study in different countries to further improve the proposed framework.

ORCID

Bejtush Ademi https://orcid.org/0000-0003-3131-1250

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APPENDIX A: INTERVIEW PROTOCOL A

1. Can you tell me about yourself and your background?
   a. How long have you been with the company, and what is your role within the company?

2. In today's dynamic environment, the way businesses create, deliver, and capture value is critical. It is the business model that describes how this is done. How important would you say business model and business model innovation is to your organization?
   a. How do you move towards a sustainable business model?
   b. How would you describe the main milestones in this process?
   c. How would you describe some of the key challenges throughout this process?

3. Tell me about the barriers your organization faces in its efforts towards a sustainable business model?
   a. How do barriers change or evolve throughout the process?
   b. Are there any other barriers you have not mentioned yet?
   c. What do you consider the most important elements of a sustainable business model?

4. How do you decide whether a new business model is something you want to keep and expand?
   a. How do you filter new business model ideas through the process?

5. How are stakeholders involved in the process?
   a. How would you describe some of the key challenges posed by stakeholders?
   b. How did/do you cope with such challenges?

6. What are the sustainability ambitions and targets of your organization? What would your organization like to achieve?
   a. How would you describe your organization's view on sustainability?
   b. Do sustainability issues impact your organization's business model, if so, how?

7. How would you describe your approach in aligning sustainability goals for the overall group?
   a. How are sustainability goals addressed throughout the organization?
   b. How would you describe some of the key challenges in aligning sustainability goals?
   c. What would you say are the main resistance points coming from business units regarding the approach to sustainability?
   d. How do you deal with such resistances?

8. Is there something you would like to add? Something I should have asked or know about?