Employee-Driven Green Innovation

An exploratory study

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by

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Preface

Hereby I proudly deliver my thesis, the final result and pinnacle of my long academic career with a cherry on top the Management of Technology programme, and I feel quite accomplished. The past years have been packed with priceless learning opportunities, events that have formed me into the person I am today, and opportunities for personal growth. This thesis is a testimony of the commitment, perseverance and enthusiasm I put into my research, and it is an honour for me to present the findings to you.

Most importantly, I want to thank my Parents, Willemjan and Janita, Who throughout the years have been there for me, supporting me unconditionally. Further, I would like to express my gratitude to the incredible friends who have supported me throughout the years. Andreas, Daniel, Felix, Fin, Frits, Mark, Robbert and Robin. Your variety of traits, company, and support have made my journey infinitely more enjoyable. I would not have wanted to miss a single one of the priceless experiences we have had together, and I am tremendously grateful for them, Once again thank you all.

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I also wish to convey my deep appreciation to all the participants who willingly shared their time and perspectives for this research. Their invaluable contributions have greatly enhanced the depth and quality of the findings in this thesis.

This is the long-awaited end of an important chapter in life and I am looking forward to what the future awaits.

Ritchie Damen - 5424313
Delft, August 2023

Summary

The primary objective of this research is to investigate and expand upon the theory of Employee-Driven Green Innovation (EDGI) as conceptualised by Buhl et al. (2016). Given the scarcity of research, as identified by the literature review done, on EDGI within the Fast-Moving Consumer Goods (FMCG) manufacturing industry, it's essential to emphasise that this study is exploratory. The pressing global demand for sustainability, which is putting significant pressure on the FMCG sector to adopt greener practices, further necessitates such an exploration.

To answer the research objective the following research question was formulated:

> *How can organisations in the Fast-Moving Consumer goods manufacturing industry effectively engage in employee-driven green innovation?*

To achieve the research objective, 12 individuals working within the FMCG manufacturing industry were interviewed using semi-structured methods. The collected data was subsequently analysed using a template analysis technique, an approach within the scope of thematic analysis. Furthermore, an inductive reasoning strategy was employed, adopting a bottom-up approach for data interpretation. This meant that the template for analysis was not predefined but evolved during the data collection and interaction process. This process led to several research findings categorised into three main themes, all of which significantly contributed to fulfilling the objective of this thesis and answering the main research question.

The first theme identified in this research relates to the definition of EDGI. The results indicate that EDGI can be characterised by four elements: voluntary participation, ordinary employees, innovation as an outcome, and green impact. Understanding this definition can assist organisations in establishing a foundation for EDGI initiatives.

The second theme pertains to the antecedents of EDGI, which can help organisations effectively engage in such initiatives. The research findings highlighted eight key antecedents, corroborating the four antecedents initially proposed by Buhl et al. (2016) and adding four more. Despite the variation in terminology used for these antecedents, the underlying concepts align with the initial conceptualisation. These antecedents, ranked in ascending order from least to most impactful, are autonomy, network & community, communication, employee empowerment, motivation, managerial output, and organisational factors.

The third theme identified in our study pertains to the outcomes of EDGI. These outcomes can be categorised into organisational outcomes, employee outcomes, and associated challenges. In terms of organisational outcomes, our findings demonstrate that EDGI leads to several positive impacts, including financial benefits, compliance with regulatory bodies, alignment with investor and customer demands, enhanced idea generation, and a positive cultural shift within the organisation. From the perspective of employees, EDGI has been found to yield positive outcomes such as personal development, increased job satisfaction, and enhanced motivation in the workplace.

However, our research also uncovers some challenges associated with EDGI. For instance, ineffective management of ideas could potentially demotivate employees. Moreover, the adoption and implementation of EDGI can have significant cost and time implications for the organisation. Thus, while EDGI presents multiple advantages, it is critical to manage and mitigate these potential challenges to maximise its overall benefits.

This study has both theoretical and practical implications. The findings both corroborate and expand upon Buhl et al.'s conceptualisation of EDGI, specifically within the context of the FMCG industry. The identification of additional antecedents enhances the existing theoretical understanding of EDGI. Further, examining the outcomes and challenges of EDGI from the perspectives of both managers and employees in the FMCG sector addresses previously existing research gaps and creates opportunities

for new research. As for practical implications, this research provides guidance for organisations on how to foster EDGI by highlighting the importance of understanding the concept, its antecedents and expected outcomes.

This report starts with Chapter 1, an introduction to the background for the research following problem analysis and relevance. Then in Chapter 2 a literature review further builds on the problem analysis identifying a knowledge gap, which is then used to formulate the research problem & objective and the main research question and sub-questions. Chapter 3 delineates the methods employed in this study, covering both the collection and examination of data. In Chapter 4, the findings from the research are detailed. The report concludes with Chapter 5, which offers a discussion on the results found by the research, a conclusion, as well as an exploration of theoretical and practical impacts and potential directions for potential future research.

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Nomenclature

Abbreviations

Abbreviation	Definition
EDI	Employee-driven Innovation
EDGI	Employee-driven Green Innovation
FMCG	Fast Moving Consumer Goods
GI	Green Innovation
GHG	Green House Gasses
HR	Human Resources
HRM	Human Resource Management

1

Introduction

1.1. Background

The importance of environmental sustainability has gained increasing recognition in recent years, driving a surge of research on green innovation (GI) in both academia and industry. This trend is mirrored in the market as well. Statista (2022) predicts nearly double the growth in market size year on year from 2021 to 2030, signifying that companies are not only entering but also actively competing in the rapidly evolving market of green technology. Further validating this trend, McKinsey & Company (2023) provides additional evidence of growing market demand for sustainable products. Hence, the importance of acknowledging and responding to this requirement becomes apparent, thereby emphasising the imperative for industries to allocate resources towards and synchronise with environmentally-friendly advancements.

GI is an important tool that can help society, organisations, and businesses achieve environmental sustainability (Chu et al., 2019). It plays an important role in achieving competitive advantage and improving economic performance while addressing GI challenges and the environment, according to a systematic literature review conducted by Karimi Takalo et al. (2021). On top of this, it also increases the firms' environmental performance, on an intra-organisational level GI can increase job satisfaction and employee retention.

Green innovation can be defined as the process that leads to the establishment of new production methods and technologies intended to reduce environmental risks, such as pollution and the adverse effects of resource (e.g., energy) extraction Carrillo-Hermosilla et al., 2010; Castellacci and Lie, 2017). Furthering on the background Weng et al. (2015) conducted research on GI using a stakeholder perspective and identified several stakeholders that have a mediating effect on GI, external and internal stakeholders, for the internal stakeholders there was a positive correlation between employee conduct and GI. Confirming the research of Zhu et al. (2008), which stresses that companies will struggle to achieve their environmental objectives if their staff do not support their policies. For organisational success in terms of achieving GI, it is of importance that employees together with their skills and experience are considered when implementing corporate culture (Weng et al., 2015).

With employees being an important stakeholder for GI, it is the first bridge to employee-driven innovation (EDI), EDI refers to *"the generation and implementation of new ideas, products, and processes – including the everyday remaking of jobs and organisational practices – originating from the interaction of employees, who are not assigned to this task"* (Høyrup and Møller, 2012; p. 8).

EDI has been made out of three orders according to Høyrup and Møller (2012):

i. A bottom-up process in which innovation emerges from the everyday cultural practises of employees, including practices that did not begin with the goal of innovation

ii. A combination of bottom-up and top-down processes in which management attempts to formalise promising innovation processes originating from employees

iii. A top-down process in which management invites employees to participate in the innovation process

The increasing prevalence of EDI over the past decade can be attributed to the increased importance of innovation in today's business environment, as emphasised by Schumpeter's theory, as well as the recognition of employees' crucial role in this process (Hansen et al., 2017; Kesting and Parm Ulhøi, 2010). This shift addresses modern employees' expectations for gratifying employment, personal growth, and recognition as valuable organisational members while adapting to the changing nature of employment and the evolution of remote work. Companies face challenges in attracting and retaining top talent, leading to a greater emphasis on fostering an innovative culture that empowers employees to take ownership of their work and contribute to the company's success. By embracing contributions from employees at all levels and acknowledging their unique knowledge and ideas (Høyrup & Møller, 2012), businesses have been able to break down traditional silos and unlock new creative potential.

Buhl et al. (2016) are one of the first authors to recognise the importance of combining EDI and GI. As it conceptualises EDI being used for green innovations, it defines employee-driven green innovation (EDGI)as ordinary employees' voluntary engagement in innovation activities within an organisational context that, intentionally or not, leads to environmental improvements (Buhl et al., 2016). Furthermore, it gives three concrete reasons why the literature on EDI and GI should be combined, these three reasons are:

1. Finding new solutions to environmental issues requires the participation of a vast array of stakeholders, including employees.
2. Within organisations, employee creativity is a significant source of innovation that is readily accessible. Employees can blend practice-based experiences with environmental expertise gained from ”tacit knowledge,” ”private consumer experience,” and ”green identity”
3. The participation of employees with a ”green identity” in GI processes can be helpful as organisations can profit from these green employees' initiatives in promoting green innovations.

The majority of the available research on Green Innovation (GI) has been conducted outside Europe (Akbari et al., 2022). However, as per Buhl et al. (2016), each region with its distinct cultural landscape can influence innovation uniquely, which potentially affects the applicability of insights drawn from non-European contexts. Therefore, there is a compelling case for an in-depth investigation into GI and, more specifically, EDGI within Europe.

1.2. Problem Statement

The aim of this study is to create an understanding of EDGI, its antecedents and outcomes. Although the concept of EDGI has been introduced, it remains unclear to what extent organisations are familiar with or employ this concept in practice. As highlighted in section 2, given the present focus on innovation and sustainability, there's a pressing need to understand if and how EDGI is being integrated into organisational strategies and operations.

With this in mind, it becomes vital to explore the mechanics of EDGI and understand the current attitudes of European companies towards this concept. In addition to this, understanding the drivers (antecedents) and potential outcomes of EDGI initiatives could offer valuable insights. These insights could inform strategies to enhance EDGI practices, thereby aiding organisations in their journey towards environmental sustainability.

In more detail, based on the annual publication volume, it can be observed that EDI is an emerging phenomenon that has yet to be extensively integrated with sustainability considerations. Furthermore, research on EDGI is still in its infancy (Buhl, 2018; Flocco et al., 2022; Kesting & Parm Ulhøi, 2010). The limited number of papers on the topic suggests that exploratory research could be appropriate. As Sekaran and Bougie (2016) argue, when there is limited research on a particular phenomenon, such as EDGI, exploratory research should be employed.

1.3. Reflection

This master's dissertation has been conducted to fulfil the requirements of the Master's in Management of Technology program at Delft University of Technology. In the context of this research, the objectives of the MSc Thesis, as outlined in the study guide, are examined in relation to their pursuit and achievement Verburg, 2023.

- The work touches on multiple disciplines

This thesis incorporates various fields of study, including environmental science, technology, business management, and human resources. The study's multidisciplinary approach facilitated the incorporation of diverse perspectives, theories, and methodologies from multiple domains. The study facilitated the examination of the dynamic relationship between employee-led green innovation and organisational operations.

- The work contains an analytical component

The primary objective of this thesis involved a significant analytical component. Initially, a comprehensive analysis of existing literature was undertaken to identify gaps in current knowledge. Subsequently, all conducted semi-structured interviews were meticulously analysed. The findings of the study were then constructed based on this comprehensive and thematic analysis.

- The work has a focus on a technical application or domain

The focus of this thesis is EDGI, a subset of EDI that falls under Open Innovation that specifically pertains to the development and implementation of new technologies. As such, this study is deeply rooted in the technical domain, exploring how employees can drive technological advancements and contribute to sustainable practices within their organisations.

- The study demonstrates comprehension of technology as an organisational asset, or it is conducted from the viewpoint of a business entity.

Furthermore, this study recognises the potential of EDGI and focuses on how organisations can make use of this concept and how the outcomes can benefit them.

- The student has used scientific methods and techniques to analyse a problem in accordance with the MOT Curriculum

In this research, a systematic literature review was done, semi-structured interviews, and template analysis—a type of thematic analysis—all methods embedded in the Management of Technology (MOT) curriculum, were effectively employed adhering this thesis to the scientific precision and methodological norms outlined by the MOT curriculum.

2

Literature review

To be able to establish research on EDGI first an understanding of both employee-driven- and green innovation has to be created. This understanding will include an explanation of both concepts, their advantages and challenges. Furthermore, the conceptualisation of EDGI will be explored.

2.1. Green innovation

The definition of ”Green innovation” used in this paper is formulated based on the most recent studies pertaining to the topic, as follows GI is: The process that leads to the establishment of new production and technology with the goal of lowering environmental risks, such as pollution and the adverse effects of resource extraction (e.g. energy) (Carrillo-Hermosilla et al., 2010; Castellacci & Lie, 2017). The systematic literature review (Wang et al., 2021) compared several studies over time and concluded that GI can be split into two streams, green product innovation and green process innovation (Gupta and Barua, 2018; Marcon et al., 2017; Zailani et al., 2015).

Green product innovation needs the manufacturer or company to consider the product's life cycle. The primary objective is to reduce the environmental footprint of the product by increasing durability, recyclability, raw material usage reduction, and selection of environmentally acceptable raw materials(Xie et al., 2019). Meanwhile, green process innovation happens mostly during the production process where the aim is to improve resource and energy efficiency and control pollutant emissions. Besides the reduction and prevention of the generation of pollutants, it also helps firms to meet the environmental protection standards that are set by the government, thus improving their social reputation (Xie et al., 2019; Wang et al., 2021).

2.1.1. Advantages

According to Weng et al. (2015), GI efforts are more likely to result in improved environmental performance, including a reduction in waste output and emissions, for organisations. Singh et al. (2021) found that green product and process innovation positively correlates to competitive advantage and positively and significantly predicts firm performance and confirmed this with the research of (El-Kassar and Singh, 2018; Tang et al., 2018). Xie et al. (2019) demonstrate that implementing GI strategies, such as employing pollution-reducing machines and developing environmentally sustainable packaging for both existing and new products, can significantly boost a company's financial performance. Furthermore, Weng et al. (2015) concluded that when firms emphasise green practices, such as GI, it affects not only environmental performance but also both financial and non-financial firm performance. As a result of spillover effects, non-green products of a company may also see increased demand, resulting in an increase in market share and revenue. Clearly, businesses that adopt green innovations early on might benefit from ”First-mover advantages” and potentially charge a premium. Finally, several more articles have concluded that GI can help effectively improve the firm's economic performance and increase market competitiveness (Karimi Takalo et al., 2021; Przychodzen & Przychodzen, 2015; Yook et al., 2017).

2.1.2. Challenges

In addition to the many benefits associated with GI, there are also challenges associated with it. One could argue that the different barriers to innovation are the same as those of GI. However, due to the different characteristics of GI compared to non-green innovation, the relevance of innovation barriers may be significantly different for GI (Stucki, 2019). In this context, ”barriers” and ”challenges” are used interchangeably to denote obstacles.

Therefore, it is important to have an overview of the main barriers. When attempting to adopt GI initiatives, businesses face financial, regulatory, and technological obstacles. Understanding these obstacles is crucial for businesses navigating the complex landscape of GI. As Abdullah et al. (2016) emphasises, it is important to know and comprehend the barriers that companies face when engaging in GI activities.

Several articles have done research on barriers to GI (Chien et al., 2021; Gupta & Barua, 2018; Huang et al., 2022; Marin et al., 2015) which has resulted in identifying six main barriers, these have been ranked in descending order of significance:

1. Political
2. Managerial
3. Technical
4. Information
5. Economic
6. Market

As Chien et al. (2021) has done an extensive literature review on barriers to GI in recent years identifying six barriers to GI which have been sub categorises into 24 sub-categories, indicating an extensive literature review. Due to the extent of the literature review, it is safe to say these are the main six barriers to GI. Political factors such as lacking or inconsistent policies, regulations, and legislation can impede GI (Chien et al., 2021). In the absence of a coherent and supportive political framework, organisations can be hesitant to invest in or adopt environmentally friendly technologies and practises (Huang et al., 2022). Following political factors are managerial factors, Gupta and Barua (2018) found that there were a lot of management hurdles within GI such as lack of management commitment, reluctance to switch to green practices, human resources and rewards systems set-up which is confirmed by more recent research of Huang et al. (2022).

Gupta and Barua (2018) identified the technological barrier as having the highest impact, however more recent research has shown that the technology is catching up and therefore is ranked less of a barrier nowadays, however, the barrier is still there and is made up of minimum R&D efforts, market uncertainty and complex design process (Chien et al., 2021; Huang et al., 2022)) some of these barriers of technological barriers could also be related back to management and economic as GI of requires large R&D efforts which need funding. Informational barriers are the results of access to reliable, relevant, and timely information regarding GI is essential for enterprises to make informed decisions. Informational barriers may emerge due to a lack of awareness, misconceptions, or inadequate access to credible data (Huang et al., 2022). Economic barriers are made up of expenses related to the development, implementation, and maintenance of sustainable technologies and practise as well as bank loans (Chien et al., 2021), which is confirmed by Cecere et al. (2020) highlighting the critical role financial constraints play in the development of green innovations, noting that limited equity and loan financing, as well as restricted access to funding from banks and private institutions, contribute to these constraints. Funding is primarily needed due to significant investment costs of GI (Aguilera-Caracuel & Ortiz-De-Mandojana, 2013), which confirms the more recent work of Cecere et al. (2020). Finally, market barriers such as inadequate demand for sustainable products and services, competition from traditional alternatives, and the absence of industry standards as well as outreach and trust issues of customers (Huang et al., 2022).

Given that the majority of advantages associated with GI revolve around stakeholders, the section 2.2 will go deeper into this aspect to ensure a thorough understanding of the various elements surrounding GI.

2.1.3. Antecedents of Green Innovation

By understanding both internal organisational factors and external environmental influences, we can better comprehend the driving forces behind the development and implementation of GI innovations. Liu et al. (2022) has defined two types of antecedents: Internal organisational factors and external environmental factors, which it has subdivided into subcategories shown in table 2.1 below.

Strategic Motivation	Motivation Category	Specific Motivation
Internal organizational motivation	Strategic and cultural factors	Green business/innovation strategy, green market orientation, environmental orientation, customer orientation, proactive environmental strategy, green organizational culture, adaptability of green culture, corporate culture
	Resource and capability factors	Knowledge base, knowledge sharing, knowledge source, knowledge absorption capacity, green human resource management, human resource quality; advanced manufacturing technology, technological capability, technological trajectory; dynamic capability, coordination ability, profitability, ecological organizational ability, team restructuring ability
	Executive characteristic factors	CEO's overseas experience, politically connected CEO, CEO hometown identity, green transition leadership, leaders' voluntary workplace green behavior, top management commitment, sustainable leadership, executive environmental awareness, management agreement, entrepreneurship and social entrepreneurship
	Stakeholders and other internal factors	Stakeholder pressure, green supply chain management/integration/learning, supply chain collaboration, management of environmental issues, export intensity, network potential, corporate environmental responsibility, internationalization, corporate green relaxation, green shared vision, corporate life cycle stage, fairness, embeddedness, open innovation, ownership, previous green innovation experience, cooperative activities
External environmental motivation	Policy environment	Environmental regulation, environmental inspection, environmental regulations, environmental policy, new environmental protection laws, research and development subsidies, legal pressure, government support, government pressure
	Market environment	Green market pressure, competitor pressure, market demand, green demand, market turbulence
	Social environment	Social impact, public supervision, environmental uncertainty, network embeddedness, network diversity

Table 2.1: Antecedents of GI (Liu et al., 2022)

The specific motivations outlined in Table 2.1, which comprise a subcategory of the motivation category, validate the drivers identified by Karimi Takalo et al. (2021). This literature review not only examines these drivers in-depth, but also provides an exhaustive overview of GI. The identified drivers include stringent environmental policies, established competitive advantages, resource capability development, customer demand, management factors, organisational encouragement, environmental uncertainty, government support, economic benefits, and stakeholder participation. Based on recent extensive literature reviews by Karimi Takalo et al. (2021) and Liu et al. (2022), it can be concluded that the primary motivation categories defined by Liu et al. (2022) serve as green innovation's antecedents.

2.2. Identifying Stakeholders of Green innovation

The concept of stakeholders in the context of GI has been widely studied and debated in the literature. One of the key distinctions in the literature is the difference between the ”stakeholder view” and ”stakeholder pressure” perspectives.

The stakeholder view perspective, also known as the stakeholder management or stakeholder theory perspective, suggests that analysing the relationship between a business and the groups and individuals who can influence or be influenced by it will help us cope with these three parties. The stakeholder theory states that businesses must have products and services that customers want, strong supplier partnerships that maintain operations cutting edge, inspired employees that believe in the company's mission and drive it to develop, and support communities to thrive(Freeman et al., 2010). Freeman defined stakeholders as ”any group or individual who can affect or is affected by the achievement of the organisation's objectives” (Freeman et al., 2010; P. 26) In contrast, the stakeholder pressure perspective focuses on the pressures that organisations face from different stakeholders, such as consumers, regulators, and competitors. This perspective suggests that organisations must respond to these pressures in order to survive and achieve success. This view is often associated with the work of Mitchell et al. (1997) who defined stakeholders as ”any group or individual who can influence or is influenced by the actions of the organisation”. Both perspectives have their own advantages and limitations, and the literature has shown that the relationship between stakeholder pressures and GI is complex and nuanced. Some studies have found that stakeholder pressures can have a positive influence on GI (Abdullah et al., 2016; Singh et al., 2021; Weng et al., 2015), while others have found no significant relationship (Thomas et al., 2021). Moreover, research has shown that the relationship between stakeholder pressures and economic performance is also complex and can vary depending on the specific stakeholders and the type of GI being considered.

Overall, the literature suggests that it is important for organisations to consider both theories. Several studies identified several stakeholders that are important in the effect on GI Weng et al. (2015) makes use of Freeman's stakeholder framework to identify these two sorts of stakeholders, external and internal stakeholders, which it then subdivides into a multitude of supplementary stakeholders. However, since this thesis will focus on EDGI the stakeholders are restricted to consumers and employees.

Consumers El-Kassar and Singh (2018) concluded that market demand for green products was found to have a positive direct influence on GI, which corresponds to Zhang and Ma (2021) which states that consumers' environmental awareness continues to grow influencing firms' economic performance. Moreover, Xie et al. (2019) illustrates the significance of green image in attracting more consumers by influencing consumer choice and enhancing consumer brand loyalty; by doing so, enterprises can grow their market share and enhance their financial performance, which is also supported by more recent research (Islam et al., 2021). However, one must also consider the consumer barriers highlighted by Xie et al. (2019) and Gupta and Barua (2018), with the cost of green products being the most major impediment.

Employees Employees are companies' most significant internal stakeholders (Baolong & Cao, 2022). A green organisational culture or climate positively influences employees' implementation of a green innovative approach. Baolong and Cao (2022) and Zhang and Ma (2021) confirm this, employing environmental management practices in their frameworks to enhance employee productivity and efficiency. Both studies highlight the importance of employees as stakeholders, which explains why Weng et al. (2015) has included them in its framework. It is also crucial to note that studies such as Gupta and Barua (2018) discuss environmental management and top management as considerable barriers, and that research often overlooks the fact that management is an employee stakeholder. In conclusion about the role of stakeholders, the findings of a multitude of literature reviews on various stakeholders (Díaz-García et al., 2015; Karimi Takalo et al., 2021; Liu et al., 2022) indicate that each stakeholder has distinct effects on GI, and that firms should try and take in all of these stakeholders resulting in a positive impact.

Within the topic of this research on EDGI, it is essential to investigate the effects of stakeholders on GI. Employees have a significant influence on GI, as evidenced by an analysis of multiple studies related to stakeholders (Singh et al., 2021; Weng et al., 2015). Therefore, one can argue that employees play a crucial part in the GI process, indicating a possible connection between GI and EDI. However, it is important to first perform an analysis of EDI and investigate the advantages and challenges in order to have a thorough understanding of how these two concepts can be adequately combined.

2.3. Employee-driven Innovation

When Schumpeter founded the theory of creative destruction he emphasised the importance of entrepreneurs and employees in the introduction of new ideas and products to the market. Schumpeter maintained that innovation is the primary source of economic progress and that it is the job of entrepreneurs and firms to produce and develop new consumer-oriented products and services (Schumpeter, 1976). The generation of innovations has traditionally been viewed as the responsibility of R&D or a special unit within an organisation; hence, the majority of businesses and researchers have concentrated on innovation at the macro level. In 1994 however Nonaka did research on organisational knowledge that is created through a continuous dialogue between tacit and explicit knowledge, and found that organisations cannot afford to ignore any tacit knowledge and pointed out the potential strength of ordinary employees as innovative resources.

Høyrup and Møller (2012) are among the founders of the concept EDI, in their article EDI: A New Approach they define EDI as the following: ” The generation and implementation of new ideas, products, and processes....Employees are active and may initiate, support or even drive/lead the processes.”(Høyrup and Møller, 2012; P. 8).

This conceptualisation of EDI is an extension of the definition made by (Kesting & Parm Ulhøi, 2010), whereby EDI is seen as a more bottom-up process as to only top-down. Nevertheless both (Høyrup & Møller, 2012) & (Kesting & Parm Ulhøi, 2010) emphasise the significance of employees in their capacity as innovators, highlighting their acquisition of distinctive, comprehensive, and context-specific knowledge, commonly referred to as tacit knowledge, which managers frequently lack. Additionally, Bäckström and Bengtsson (2019) emphasises the competitive advantages gained by including the employees within the innovative culture.

As EDI describes, ordinary employees are systematically integrated into the various phases of the innovation process. Integrating employees into innovation processes will mean there is innovative work behaviour which consists of three phases as found by (Bäckström & Bengtsson, 2019) based on the research of (Scott & Bruce, 1994). These three phases of the innovative process are: Idea generation, Idea promotion and idea realisation. It is first discussed by Amabile et al. (1996), who argue that all innovations begin with creative ideas generated by individuals and teams within an organisation, to which EDI can be tied and viewed as a bottom-up approach. This is supported by Smith et al. (2012), who affirm the importance of creativity in EDI while also asserting that EDI is comprised of more elements than creativity alone. Bäckström and Bengtsson (2019) stated that research has been conducted over time on both bottom-up and top-down approaches, verifying the three categories established by Høyrup and Møller (2012). These three categories of activity comprise the foundation of EDI:

- **First order EDI:** These are bottom-up processes, initiated by employees, in which ”autonomous creation of novelties at the grassroots level” gives rise to innovations. In this case, innovations occur informally as a result of employees’ routine work practises and are not initiated on purpose for the sake of innovation.
- **Second order EDI:** This form refers to management efforts that try to systematise and formalise promising innovation processes originating from employee initiatives. As a result, there are both bottom-up and top-down processes.
- **Third order EDI:** Here, EDI activities are encouraged by managers who specifically motivate and ask employees to take part in these innovation processes. These top-down innovation processes are usually established with a predefined innovation target.

Although management involvement/practices in EDI have received less research than bottom-up approaches, and as indicated by (Bäckström & Bengtsson, 2019), top-down approaches have a more favourable perspective on EDI. The study conducted by Echebiri (2020) indicates that the self-leadership of employees is a significant contributor to their innovativeness, but it also emphasises the significance of the leadership of management and organisations in this regard. Essentially validating what (Kesting & Parm Ulhøi, 2010) asserts, that EDI can be significant if correctly managed, and corroborating the work of (Smith et al., 2012), which has mapped critical antecedents for EDI, one of which is leadership support. Recent research by Bäckström and Bengtsson (2019) reinforces this by establishing a favourable relationship between leadership support and innovative work behaviour among employees. However, it is important to emphasise that both bottom-up and top-down approaches should be taken into account. The section that follows offers an in-depth review of EDI, highlighting its benefits and challenges before summarising this section.

2.3.1. Advantages

The increasing number of publications on knowledge platforms such as Scopus and Web of Knowledge demonstrates that EDI is a growing area of study within the innovation field. Several researchers have observed this expansion (Kesting and Parm Ulhøi, 2010; Opland et al., 2022. Research on EDI has subjected several advantages such as employee retention (Flocco et al., 2022), which comes out of engaging employees to be part of the innovation process and creating more challenges for employees has shown to increase this, Second, Participation is a crucial method for increasing employee satisfaction and identification with an organisation's activities (Kesting & Parm Ulhøi, 2010).

For managers to be able to make tough, well-considered decisions, they must have a comprehensive understanding of the firm's activities, overall strategy, and the surrounding environment. This implies that managers should be well-versed in operational matters, which is typically not the case. Management frequently lacks information, which is where employees come in; they can often identify opportunities or attract attention to the repercussions of choices that management cannot. Managerial decisions about innovations are highly constrained, so ordinary employees can offer originality, networks, and tacit knowledge.(Kesting & Parm Ulhøi, 2010). It is also vital to highlight that EDI creates a competitive edge in modern society by applying all of the aforementioned benefits to outcompete the rest of the competition. Nonetheless, one should not forget that EDI is not without its challenges.

2.3.2. Challenges

The literature on EDI lists a number of obstacles that firms must overcome to maximise the potential of this strategy. One difficulty is the reluctance to change, as Zwick (2002) shows that overqualified individuals may resist workplace innovation, hence diminishing EDI's effectiveness. Kesting and Parm Ulhøi (2010) note that employees may be reluctant to adopt new ways of thinking due to the possibility of an increase in workload or job instability.

A further challenge is management support. Bäckström and Bengtsson (2019) stress the significance of managerial support to the success of EDI. Inadequate assistance can reduce employee motivation and consequently affect staff retention. Kesting and Parm Ulhøi (2010) suggest that integrating employees in the innovation process helps retain talent and discourages people from forming their own companies to exploit their ideas.

In EDI, companies must find the right balance between autonomy and control. Bäckström and Bengtsson (2019) warn against relying only on a bottom-up strategy for EDI since it can result in unmanageable and unpredictable innovation, especially in knowledge-intensive industries. To avoid being overwhelmed with uncoordinated ideas and solutions, Kesting and Parm Ulhøi (2010) suggest striking a balance between employee autonomy and order in the innovation process.

2.3.3. Antecedents of Employee-driven Innovation

Analysing the antecedents of EDI and GI has brought us to the point where it is possible to establish potential antecedents of EDGI, keeping in mind the possibility of verifying them.

EDI & GI have provided us with a good overview of how these two concepts can emerge. As EDI is still in the early stage of the development phase, it can be expanded by combining it with GI. In the following section, we will examine the antecedents of EDGI and the reasons behind them. This will

serve as the starting point for interviews, creating an overview of the antecedents for EDGI.

Even though there is limited research on the antecedents of EDI, the research that has been done corresponds which each other. Smith et al. (2012) found four antecedents for EDI which are:

1. Leadership support
2. Autonomy
3. Collaboration
4. Organisational norms of exploration

Echebiri (2020) which focuses on the individual level also points out that the importance of leadership and autonomy, reinforcing the research of Smith et al. (2012). Opland et al. (2022) confirms all four of the antecedents of EDI and uses it to further explore the motivation of employees and found that intrinsic motivation is an important factor for EDI, which is something Flocco et al. (2022) also found. To have a better understanding each antecedent will be shortly explained.

Leadership support Ordinary employees face risks when coming up with new ideas that question existing practices such as negative exposure, indifference from management, and loss of rewards or benefits. It is therefore even important that leaders or management should support and protect new ideas, recognise and reward innovative behaviour, and ensure that employees have the necessary resources for implementation resulting in an increase of EDI (Smith et al., 2012).

Autonomy Smith et al. (2012) defines autonomy as the extent to which employees are given the freedom to make decisions and to carry out tasks without excessive supervision. Research displays that autonomy has been widely recognised as a management technique for increasing employees' job satisfaction. Additionally, it argues that employees generate the most creative ideas when they worked in 'a high task-autonomy work environment' and may also increase the possibility of introducing unexpected opportunities (Smith et al., 2012).

Collaboration Collaboration entails working together and sharing knowledge and information. According to Smith et al., 2012, when individuals share ideas with others, they are exposed to a greater degree of reflection than idea generators who work alone. This is because sharing ideas and knowledge in groups encourages individuals to make additional associations. Moreover, according to Smith et al., 2012, research indicates that collaboration can serve as a viable strategy for refreshing inventors who have experienced a decline in creativity, by facilitating the discovery of novel and innovative ideas.

Organisational norms of exploration Organisational norms of exploration emphasise the normative aspects of organisational orientation as an antecedent of EDI (Smith et al., 2012). The impact of intellectual practises, such as motivation and challenge, on innovation, are noteworthy, as is the influence of coordination practises, which involve allowing employees to determine the pace of work, sequence of task completion, and work methodologies. The attitudes of an organisation that have an impact on innovation include trust, open-mindedness, flexibility in work tasks, and a disposition that fosters a culture of learning. The exploration of organisational norms highlights the variable of "managerial attitude towards change," indicating that in organisations where managers exhibit a positive attitude towards change, the internal climate is more likely to be conducive to innovation. One could argue that it is a summation of the antecedents from above together.

2.4. Employee-driven Green Innovation

Existing research, as illustrated in prior sections, emphasises the importance of stakeholder participation in GI, with a specific emphasis on employee engagement. Furthermore, there is an increasing demand for sustainable innovation in a wide range of industries. According to (Ciocirlan, 2017), attaining sustainability on all macro levels requires an emphasis on individual actions. This idea is consistent with the concept of EDI, which has been proven to positively impact the performance of a company, hence demonstrating its value.

2.4.1. Defining Employee-driven Green Innovation

Buhl et al. (2016) were among the first to notice the potential advantages of combining EDI with GI, which gave rise to the concept of EDGI. The authors define EDGI as: ”ordinary employees’ voluntary engagement in innovation activities within an organisational context that, intentionally or not, lead to environmental improvements” (Buhl et al., 2016; P. 5). This novel concept emphasises the crucial role employees play in promoting sustainable change and establishing an organisational culture of environmental responsibility.

When diving further into the work of Buhl et al. (2016), it is argued that the core concepts of EDGI are EDI & GI. Based on the core concepts Buhl et al. (2016) further defines EDGI as follows: ”In contrast, EDEI primarily describes employees’ innovative activities regarding sustainability in their companies’ production as well as product development processes” (Buhl et al., 2016; P. 10), which is in line with the definitions of GI as described in the previous section. GI is built up out of two components, green product and green process innovation, the definition of green product innovation is: Green product innovation needs the manufacturer or company to consider the product’s life cycle. The primary objective is to reduce the environmental footprint of the product by increasing durability, recyclability, raw material usage reduction, and selection of environmentally acceptable raw materials(Xie et al., 2019). Meanwhile, green process innovation happens mostly during the production process where the aim is to improve resource and energy efficiency and control pollutant emissions.

As well as this definition has combined the main characteristics of GI and EDI it is a general definition which might differ from industry to industry. As there is little information to confirm whether this question is valid or not.

2.4.2. Importance of Employee-driven Green Innovation

Buhl et al. (2016) has identified several new concepts explaining the potential of EDGI. Among these concepts are Private consumer experiences and Green identity. These additions complement the existing literature on EDI, which primarily discusses employee tacit knowledge, including aspects of practice-based experience, company-specific knowledge, and useful networks (Høyrup & Møller, 2012; Kesting & Parm Ulhøi, 2010; Smith et al., 2012). A comprehensive understanding of these three potential areas is crucial.

Furthermore, Buhl et al. (2016) argues that EDGI can lead to sustainable competitive advantages, based on the resource-based view, as environmental leadership, culture, and capability are considered intangible assets. Buhl et al. (2016) connects this view with the research of Chen (2007), which advises that organisations should enhance their green intellectual capital. Green intellectual capital comprises three categories, with green human capital being the third, further solidifying the importance of EDGI within companies. Buhl et al. (2016) create the foundation for EDGI whereby it identifies three potential ways in which employees can effectively contribute to GI within a company, these are: Private consumer experience, Green identity, Tacit knowledge.

Private Consumer Experience As indicated in section 2.1, consumers have an important influence on GI. This is confirmed by (Buhl et al., 2016) which argues that employees are able to compensate for their potential deficiencies concerning strategic market orientation(Opland et al., 2022; by introducing their private consumer experiences. Employees can give useful insights, concerns, and feedback regarding customer interactions and expectations by incorporating their private consumer experiences into the organisation’s GI process resulting in for example prevention of green product development that misses customer preferences.

Green Identity Green identity is a defining characteristic of employees who share strong pro-environmental values and beliefs. Buhl et al. (2016) found that these green employees have acquired comprehensive environmental knowledge and skills as they engage both at home and at work with their beliefs. This knowledge and expertise can help them come up with more creative ideas towards environmental protection (Ciocirlan, 2017). Based on these findings (Buhl et al., 2016) proposes green identity of employees as a valuable key resources for organisations' their innovative performance.

Tacit Knowledge Employees possess tacit knowledge and practice-based skills, which are crucial for GI processes, but often overlooked by managers. This implicit knowledge stems from learning processes occurring during daily operational activities. In addition, employees gain valuable insights from day-to-day interactions with external partners, such as customers and suppliers, helping to inform customer satisfaction levels (Bäckström and Bengtsson, 2019; Kesting and Parm Ulhøi, 2010).

With their unique awareness of organisational processes, employees are able to discover opportunities for reducing environmental impacts and anticipate the consequences of work routines that managers may not recognise (Kesting & Parm Ulhøi, 2010). Therefore, employee participation in GI processes can greatly contribute to overcoming managerial decision-making gaps by harnessing their tacit knowledge for enhanced environmental outcomes (Buhl et al., 2016).

2.4.3. Antecedents of Employee-driven Green Innovation

With respect to the research objective, it is necessary to investigate the antecedents identified for both EDI and GI, to explore and investigate if there are already clear similarities and use these as some bases for the interviews to confirm these, Buhl et al. (2016) has identified three antecedents next to the three important factors why employees should be included talked about in section 2.4.2 for EDGI.

Consequently, one can ask him/herself, how can these antecedents of GI and EDI be combined to EDGI? As EDGI activities take place in a particular organisational context. Comparatively, organisational factors that encourage or discourage employee participation in GI activities differ from the EDI's underlying concept and potentially their respective industry. Buhl et al. (2016) discuss potential antecedents of EDGI in their work. Beyond this, they also identify four key factors: leadership support, autonomy, cooperation, and an innovation climate. These factors align with the antecedents of EDI mentioned in the section 2.3.3.

The antecedents outlined are based on EDI literature, such as the works of Kesting and Parm Ulhøi (2010), and are consolidated with the findings of Ramus (2003). Ramus found empirical evidence suggesting that factors encouraging general employee innovation are the same ones promoting employee participation in green innovation processes. These factors include Leadership support, Cooperation, and Innovative climate. Using this structure, Buhl et al. (2016) conceptualises the antecedents of EDGI. Transitioning from a discussion of the broad antecedents identified in the literature to a discussion of more specific factors, it becomes evident that on top of Leadership support, Cooperation and Innovative climate (Kesting & Parm Ulhøi, 2010) the following antecedent: organisational support, autonomy, and supervisory support play a crucial role in facilitating EDGI.

Organisational Support According to Buhl et al. (2016), organisational support for EDGI should encompass both formal rewards and informal recognition, along with competence-building initiatives such as training programmes. These measures are essential in empowering employees to make valuable and effective contributions in the realm of environmental problem-solving.

Autonomy In addition, Buhl et al. (2016) emphasises the substantial levels of autonomy which are frequently cited in the literature on innovation as a key factor that facilitates innovative employee behaviour. It defines autonomy using the paper on EDI of Smith et al. (2012), which is defined as the degree to which employees are permitted to make decisions and carry out tasks with minimal oversight.

Supervisory Support On the basis of organisational support, leadership factors such as prompt responses to employee suggestions and the acceptance of errors as opportunities for improvement are essential for fostering innovation and eco-friendly practices. Buhl et al. (2016) finds this an essential mechanism for encouraging employee participation in sustainable innovation. When employees perceive their supervisor's support, they are more likely to go beyond their specific responsibilities and actively participate in GI activities, regardless of their hierarchical position or functional department(Ramus, 2002).

Surprisingly, Buhl et al. (2016) deviate from these key factors in their paper, proposing an approach whereby the key factor varies according to the type of employee. This departure suggests potential areas for additional research. Buhl et al. (2016) are credited with being the first researchers to conceptualise EDGI, and they identify what potential antecedents could be. Despite this being a conceptual development, it indeed creates an opportunity for further exploration and research. This allows for subsequent studies to build on the foundation established by Buhl et al. (2016).

2.4.4. Distinguishing Employee-driven Green Innovation

EDGI and EDI have several points of overlap and similarity. These include aspects like the active and direct participation of ordinary employees in all phases of the innovation process, such as idea generation, further development, promotion, and implementation (Buhl et al., 2016). This overlap can lead one to think these are the same concept.

However, Buhl et al. (2016) distinguish one essential difference between EDI and EDGI. Which is that EDGI specifically focuses on GI, not just "general" innovation. This distinction is also noted by Reuvers (2015), who states that the primary difference between GI and 'normal' innovation lies in the focus on why the innovation is needed.

Furthermore, this distinction is confirmed in a previous discussion in section 2.1, where the primary objective of GI is identified as reducing the environmental footprint of the product. This can be achieved by increasing durability, recyclability, reducing raw material usage, and selecting environmentally acceptable raw materials Xie et al. (2019). Showing the difference with Edwards-Schachter (2018) which describes innovation as the establishment of an innovative or substantially enhanced product (be it a tangible good or service), or procedure, an original marketing approach, or a fresh organisational system in corporate methodologies, workplace structuring or external collaborations. This clearly shows the difference in focus between the two innovations further explaining the differences as EDI has a different focus of innovation than EDGI. While EDI promotes general innovations, EDGI specifically focuses on GI.

Secondly, an argument could be made for the distinction between EDGI and EDI, based on the green identity of employees, as outlined in section 2.4.2. Both EDGI and EDI share the common thread of employee-led innovation. However, employees with a green identity bring an environmental focus to their innovative efforts. This environmental perspective is integral to EDGI and green identity will therefore have more effect, separating EDGI from EDI.

2.5. Industry

As EDGI is still in its infancy, the field remains largely unexplored in terms of empirical research. While Buhl et al., 2016, conceptualised EDGI, they did not apply the framework to a specific industry, thereby leaving an open field for investigation. Additionally, they call for cross-industry research, and together with the lack of empirical research this raises the question: In what industries could EDGI potentially have an impact, and why?

The top three worldwide polluters per sector are energy supply, transportation and industry, as found by Statista (Statista, 2023a; Statista, 2023b). These top three all have a similar amount of pollution however the manufacturing industry, according to McKinsey & Company (2020), is the most expensive sector to decarbonise. Furthermore building on the importance of having a look into the manufacturing industry is that Eurostat (2023) displays that this is the sector that has the most Greenhouse gasses (GHG) emissions.

This shows there is much to gain for the manufacturing industry to reduce its environmental impact

through GI. Being involved in both the production and sale of their products, manufacturers have a distinct advantage in obtaining customer feedback via multiple channels, This includes direct interactions between employees and various stakeholders, such as customers during sales or suppliers. This dual-source feedback system provides ample opportunities for collecting valuable data and information in the context of research, allowing for a more comprehensive understanding of the factors that influence the investigated topic, such as EDGI.

The FMCG manufacturing industry, characterised by high volume, low margin, and quick turnover (Kenton & Investopedia, 2023), has a significant impact on the environment, found by Willes Towers Watson (2021) the GHG emissions of the industry contribute to 26% of the total GHG emission of the world, which is furthermore Greenpeace (2018) adds to this by touching on the plastic pollution as well. Furthermore, there is also increasing consumer demand for eco-friendly products (McKinsey & Company, 2023). Adding these points up, reducing both issues and contributing to consumer demand could be sped up by making use of green innovation. As Buhl et al. (2016) emphasises this is where the green identity, tacit knowledge and private consumer experience of employees become crucial.

Therefore, the FMCG industry provides a setting for examining the potential impacts of EDGI, offering valuable insights into the role of employees in driving green innovation.

2.6. Concluding the Literature Review

In conclusion, this literature review has provided a comprehensive overview of the concepts of GI and EDI, highlighting their potential benefits and their relevance to the contemporary business environment. Specifically, it has demonstrated that GI is crucial for companies to comply with government policies and gain a competitive advantage, leading to better environmental and financial performance. Meanwhile, EDI has been shown to enhance employee retention, innovation, and diverse insights. However, the review also revealed a lack of empirical research on the combination of EDI and GI, named EDGI. Buhl et al. (2016) specifically calls for more empirical research on this topic, further emphasising the need. Additionally, the review identifies industries that could potentially be of interest for conducting empirical research.

Despite the potential benefits of EDGI, the research on this topic is limited and there is a conceptual paper by (Buhl et al., 2016) defining it. Although this paper outlines the potential applications of EDGI and identifies intra-organisational factors that facilitate its implementation, it lacks empirical evidence. Therefore, there is a knowledge gap that needs to be addressed through future research, which could investigate the antecedents and outcomes of EDGI. By doing so, researchers can provide a more extensive understanding of how EDGI can be utilised to drive innovation and sustainable development within organisations.

2.7. Research Problem and Objective

Despite a growing emphasis on green innovation and employee-driven innovation, the literature review reveals a lack of substantial and comprehensive research combining these two factors.Buhl et al. (2016) initiated the first efforts in the conceptualisation of EDGI; however, their work primarily remained theoretical in nature and lacked empirical substantiation. Given the increasing government regulations and market demand, specifically within the FMCG manufacturing sector, there exists an urgent imperative to investigate and augment innovative capacities. According to a report by McKinsey & Company (2023), there is a growing market for sustainable products, thus underscoring the significance of addressing this demand. The objective of this study is to expand upon the conceptual framework of EDGI proposed by Buhl et al. (2016) by incorporating empirical investigation. The insights derived from this study have the potential to offer practical implications for manufacturers operating within the FMCG industry and could serve as a foundation for future advancements in this domain.

Building on the identified research problem, the objective of this research is to conduct a thorough investigation into EDGI within the context of the FMCG manufacturing industry. This research is specifically focused on understanding the various definitions assigned to EDGI by different organisations within this sector. By delving into these interpretations, this research aims to provide a more nuanced understanding of the concept and how it varies across different contexts.

Furthermore, the objective is to explore the methods and strategies that these organisations employ to encourage and foster EDGI, and to see whether or not this is actually already happening. This includes an investigation of factors such as organisational culture, employee motivation, management styles, and other potentially relevant factors.

Finally, the research will evaluate the outcomes of EDGI. We will assess the potential impact on the organisations' sustainability efforts, their reputation, as well as their influence on employees' motivation and satisfaction but also include any potential barriers or challenges faced with EDGI.

Through an in-depth exploration of these themes, this research aims to contribute to a more robust understanding of EDGI and its practical implications for the FMCG manufacturing industry. Ultimately, this will enhance both theoretical knowledge and practical application of green innovation driven by employees in this sector.

2.8. Research Questions

Main research question: How can organisations in the Fast Moving Consumer Goods manufacturing industry effectively engage in employee-driven green innovation?

In order to address the primary research question, three sub-research questions were formulated based on the insights gained from Chapter 2, literature review. Each of these questions evaluates a distinct implementation process phase. The initial task was to define the EDGI in the FMCG manufacturing industry context, which resulted in the formulation of the first sub-research question.

Sub research questions

- **Sub research question 1**: How is EDGI defined in the context of organisations in FMCG manufacturing industry?
- **Sub research question 2**: What are the antecedents for EDGI in the FMCG manufacturing industry?
- **Sub research question 3**: What are the potential outcomes of EDGI in the FMCG manufacturing industry?

3

Research methodology

3.1. Research design

As argued by Sekaran and Bougie (2016) exploratory research is fit for this research objective. Exploratory research is a research strategy that aims to analyse an under-researched or poorly understood issue, find patterns and links, and produce ideas for further investigation (Sekaran & Bougie, 2016). This sort of study is particularly effective when there is minimal knowledge or comprehension of a topic, and it frequently uses qualitative methods such as interviews, focus groups, and observations.

Given the limited knowledge on EDGI, as shown in section 2, the use of an exploratory study will assist in finding new insights and understanding about the role of employees in promoting green innovation. Furthermore, this approach will effectively address the need for more empirical research. Making use of exploratory research permits flexibility in the research design, enabling the opportunity to adapt and modify as new information arises during the course of the study.

On top of this, it creates the possibility to identify the characteristics that facilitate or impede EDGI, providing useful insights for future actions or policies. Exploring the topic allows for generating hypotheses that may be tested in future studies, so adding to the expansion of the knowledge base on EDGI. Lastly, it can assist in steering the path of future research, informing more targeted, hypothesis-driven investigations to further study the phenomenon.

3.1.1. Data Collection

Exploratory research is a flexible methodology that accommodates qualitative, quantitative, and mixed-method data collection techniques. This investigation will focus primarily on qualitative research. A carefully curated selection of methods, including interviews and desk research, has been selected in order to collect the necessary information for this research. These methods were chosen to ensure a comprehensive and in-depth understanding of the research topic while preserving the flexibility inherent to exploratory research.

The process of data collection is structured as follows: Initially, desk research will be conducted to gain a thorough understanding of EDGI. Using this relevant data, interview questions will be developed in order to collect empirical data from companies in the FMCG manufacturing industry. The justification for selecting these data collection methods will be elaborated upon in the following subsections.

3.1.2. Desk Research

It is essential to conduct preliminary research because it lays the groundwork for the interviews. Before and after the interviews, desk research will be conducted to employ the concept of method triangulation, thereby enhancing the reliability of the study (Sekaran & Bougie, 2016). Desk research allows for a more thorough analysis and interpretation of data compiled from scientific papers, journal articles, and books written by and validated by field experts. However, certain disadvantages must be considered, such as the fact that the majority of research is not designed specifically for this research objective,

having a bias in the data or out-of-date data.

3.1.3. Interviews

The exploratory nature of the research method necessitates flexibility, which is useful for examining complex and dynamic topics, such as EDGI, because it permits a deeper dive into participants' perspectives and experiences, therefore a semi-structured approach has been chosen. Semi-structured interviews are a combination of structured and unstructured interviews in which the interviewer has a general structure for what they want to ask with room for follow-up questions; asking predetermined questions in a predefined sequence facilitates comparisons between respondents, but can be restrictive, which is where structured interviews lack. Less structure can aid in identifying patterns while still allowing for comparisons between respondents.

It is also important to consider the disadvantages of this data collection method, as semi-structured interviews reduce the research's validity by making it more challenging to compare participant results (George, 2022). Due to the structure of semi-structured interviews, there is an increased likelihood of research bias. The possibility to ask follow-up questions can inadvertently lead to observer bias, as participants may be influenced by the interviewer's expectations. Furthermore, there is a considerable chance of the Hawthorne effect occurring, particularly when discussing topics such as green innovation and sustainability. These topics have gained significant prominence in recent years, which may prompt participants to provide responses they believe to be socially acceptable or align with the interviewer's perceived expectations, rather than sharing their genuine opinions or experiences.

3.1.4. Population

In this section, we define the population for our study, a critical step in conducting research on the antecedents and outcomes of EDGI. The population refers to the group of individuals or entities that embody the characteristics or experiences under investigation.

As indicated in Section 2, our research population is drawn from the FMCG manufacturing industry. This population consists of employees and managers from the FMCG industry, residing specifically in the Netherlands. Focusing on this particular demographic eliminates cross-cultural viewpoints. Furthermore, the geographical proximity and shared timezone make the target population more accessible for conducting interviews, increasing the efficiency of data collection. Concentrating on a specific demographic contributes to the precision and depth of our research findings. However, it's important to note that while this particular focus enriches the insights of our study, it may limit the generalisability of our results across different populations and settings.

3.1.5. Interview Design

As previously determined, the methodology for data collection will involve the use of semi-structured interviews. The design of these interviews was as follows. Due to the different points of view of managers and employees, two distinct interview questionnaires were developed. Each questionnaire consisted of a predetermined set of questions, complemented by the interviewer's freedom to delve deeper into specific themes or responses. In both interview questionnaires, the interviewer starts by providing an introductory statement, wherein the purpose of the interview, terms of confidentiality, and consent to record the interview are presented. Subsequently, a series of topics were discussed in a logical sequence, commencing with preliminary questions aimed at generating an understanding of EDGI, and progressing towards the main questions that address the fundamental objectives of the research. Following the research question and sub-research questions, three themes were selected namely: Defining EDGI, Antecedents of EDGI and Outcomes of EDGI, all three themes are made out of 3-5 questions surrounding the topic. The first theme aims at introducing the interviewee to EDGI, and at defining the topic, which was the same for both managers and employees as this did not require any differing perspectives. After this the second theme comes which was on the antecedents of EDGI, this is where the interview questions were different for employees and for managers, the questions aimed at the same topic only were slightly modified so they would fit better both different perspectives. Following up was the theme outcomes which had the same question for employees and managers. In addition to the predetermined themes, the interview questionnaire also included supplementary questions as a contingency measure in case an interviewee provided brief responses, and had space for the possibility of further elaboration.

Appendix A contains two sets of interview questions specifically designed for managers and employees, respectively. The researchers recorded each interview and transcribed them using either a video conferencing tool or transcription software. These transcriptions were then processed for the purpose of the research (Sekaran & Bougie, 2016). At the completion of each interview, a document requesting the participant's consent for the interview's use in this study was sent to the participant. The document outlining the informed consent can be located in Appendix A.

To mitigate the previously mentioned Hawthorne effect in interviews, several strategies were used. These include fostering a trustworthy relationship with the participant, being forthright about the purpose of the research and ensuring confidentiality, and maintaining a neutral demeanour during interviews. Following with questions that are more indirect and open-ended encourages more sincere responses. These combined methods can effectively mitigate the Hawthorne effect, thereby increasing the validity of the data.

3.1.6. Sample Design

The objective of this research is exploratory in nature. Therefore, it's crucial to focus on obtaining generalisable outcomes from the data. Given that the population comprises two distinct categories, it's recommended that the sample size for each category be at least 30 (Sekaran & Bougie, 2016). This means the total sample should be a minimum of 60 but should not exceed 500.

On top, to increase generalisability it is opted to not focus on one company as this would result in a case study. However, to be realistic, this thesis has a time frame of 6 months which does not give a lot of room for extensive research. Therefore, with the time frame in mind, the aim is to interview 20 people in the FMCG manufacturing industry. The chosen interviewees are those anticipated to have professional insights on the research topic and question within the FMCG industry, considering their professional backgrounds. The sample should be divided into 10 employees and 10 managers, as this would show both insights equally.

By including managers in the sample time can be saved as they oversee multiple employees but also provide broader insights and insights from higher up as managers tend to have more of an overview of the organisations' strategy as to employees. However, focusing solely on managers would disregard the bottom-up perspective, which is fundamental to employee-driven innovation. Consequently, it is essential to include employees in the sample. This approach not only emphasises the bottom-up viewpoint but also recognises that managers and employees may have different perspectives on processes due to their positions in the organisational hierarchy.

It is challenging to determine the exact number of employees and managers within the FMCG manufacturing industry. This makes it difficult to employ proportionate stratified random sampling, a form of probability sampling, which is the best-suited sampling design for assessing different subgroups of a population (Sekaran & Bougie, 2016). Furthermore, the research is of both exploratory and qualitative nature which makes the sample design lean more toward non-probability sampling. Taking these factors into consideration to obtain the required sample the researcher should make use of quota sampling, as this is the best-suited sampling method of non-probability sampling, finalising the sampling design. Lastly, at the end of each interview, participants were asked about their acquaintances who might possess the necessary qualifications to participate in the present study.

3.1.7. Actual Sample

Quota sampling was initially undertaken via LinkedIn. However, due to a low response rate from the invited interviewees, the sampling method was supplemented with convenience sampling, lowering generalisability. This involved selecting participants from personal networks, ultimately yielding a diverse sample comprised of one Human Research Management(HRM) expert, four managers, and seven employees. These individuals were employed by six different companies. Limited details can be revealed regarding the specific companies, however, it is worth noting that the sample encompassed over four distinct multinational companies operating in the FMCG sector.

The duration of the interviews varied between 25 and 45 minutes, and they were conducted either via the online video conferencing platform Microsoft Teams or in person. The period of these interviews was 4 weeks with 1 interview being outside of this period. In table 3.1 each interviewee is assigned

a unique identifier for the purpose of later referencing them in the results section of this study. The identifier consists of the letter ”P” followed by a number, allowing for differentiation and subsequent reference to each participant.

Interviewee	Company	Position
P1	1	Employee
P2	2	Employee
P3	1	Manager
P4	3	Employee
P5	4	Employee
P6	4	Employee
P7	3	Employee
P8	3	Manager
P9	X	Expert
P10	5	Manager
P11	6	Employee
P12	3	Manager

Table 3.1: Interviewees

3.2. Data analysis

After collecting the data, qualitative data analyses were used to interpret the data. To be able to make the right interpretations three important steps are taken, 1. Data reduction, 2. Data display & 3 drawing conclusion. This entire process can be characterised as a continuous and iterative opposed to a linear process (Sekaran & Bougie, 2016), which is shown in Figure A.1.

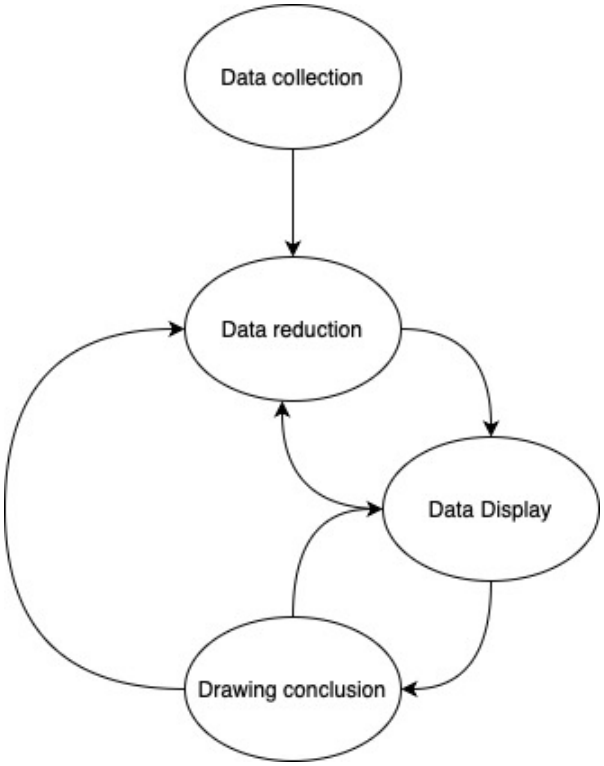

Figure 3.1: Data analysis

3.2.1. Data Analysis Method

The exploratory nature of this research lends itself naturally to thematic analysis, making it the most appropriate method for data analysis. As literature reviews in chapter 2 reveal a lack of research on this topic, suggesting an inductive approach for the thematic analysis.

According to King et al. (2017), ”the term ’thematic analysis’ does not refer to a single method, and in qualitative organisational research, there are numerous different approaches to thematic analysis.” (P. 180) This necessitates adaptability and variety in the implementation of thematic analysis.

After collecting the data, it was determined to employ template analysis. This choice was necessitated by the need to code the data, cluster it, and establish the relationships between the various codes and clusters. In addition, the decision to develop three major themes based on the sub-research questions strengthened the choice to employ template analysis.

Despite its flexibility, this methodological approach imposes a degree of responsibility on the researcher. According to King et al. (2017), it is crucial that the chosen method aligns with the research objectives and maintains coherence. This was kept in mind throughout the research process to ensure that the findings were consistent with the initial objectives.

The interviews were coded using ATLAS.ti, a computer-assisted software for quantitative analysis. This choice was made to enhance efficiency during the coding process. Furthermore, the researcher was able to access this software at no cost via a Delft University of Technology license.

3.2.2. Data Analysis Procedure

The process of data analysis is conducted systematically, following the template analysis displayed in (King et al., 2017).

Familiarisation The initial step involves becoming thoroughly acquainted with the data. The objective here is not to label each individual line of text, but rather to comprehend its context within the participant’s entire narrative. Therefore, prior to coding, it is essential for the researcher to repeatedly review the data, and in this instance, also listen to the recorded interviews. Therefore, after each interview, the researcher would re-watch the recorded session before reviewing the automatically generated transcripts. The transcripts, which were generated automatically by the video conferencing software, were then compared to the audio recording to ensure their accuracy. If there were any discrepancies, the necessary adjustments were made. To adhere to the HREC protocol, steps were taken to ensure the anonymity of the interviews and then summarised for the appendices as can be seen in Appendix A. Finally, the researcher reexamined the data to ensure a thorough comprehension of the gathered information.

Preliminary Coding During this phase, a process known as open coding is carried out, in which any portion of text potentially pertinent to answering the research question is marked with a code that encapsulates the main idea conveyed by that passage. At this stage, the focus is not on developing refined themes, but rather on identifying all potential information that could enhance the study. After familiarisation with the data, open coding was applied to each interview transcription. Any relevant portion of the responses to the interview questions was encoded with a label consisting of one to five words to ensure brevity, effectively emphasising the passage’s central idea.

Clustering and Core themes The codes are then organised into logical groups. Clear duplicates are eliminated, and codes with mutual relevance are grouped into clusters. This represents the first step towards establishing significant themes and clusters. These clusters were then placed under either of the 3 themes decided, Defining, antecedents & outcomes of EDGI. Clusters of interconnected codes within each major theme formed subsets within the theme. However, this step was not taken until after all the interviews had been conducted to ensure adequate data collection prior to the formation of primary themes and clusters.

Initial Template As soon as the researcher has a solid understanding of the groups and their associated themes, the preliminary template can be constructed. This step does not necessarily occur after all interviews have been conducted. Given the similar backgrounds and expertise of the interviewees in this study, the decision was made to formulate the initial template after all the interviews were conducted within each group. The creation of this preliminary template required the identification of the clusters within the central themes. Various coding levels were established within these overarching themes, assessing the interrelationship between distinct code groups. As a result, an initial template with a distinct hierarchical structure was created, containing three primary themes and 15 initial categories within these themes. Figure 3.2 illustrates this initial template's structure.

1. Defining
- *1.1. Voluntary participation*
- *1.2. Ordinary employees*
- *1.3. Green impact*
- *1.4. Intentional EDGI*
- *1.5. Unintentional EDGI*

2. Antecedents
- *2.1. Autonomy*
- *2.2. Network & collaborations*
  - *2.2.1. Collaborations*
  - *2.2.2. Sustainability networks*
  - *2.2.3. Network empowerment*
- *2.3. Communication*
  - *2.3.1. General communication*
  - *2.3.2. Promoting EDGI*
  - *2.3.3. Top-down communication*
- *2.4. Stakeholder pressure*
  - *2.4.1. Customer demand*
  - *2.4.2. Investors*
  - *2.4.3. Government monetary incentive*
  - *2.4.4. Government regulations*
- *2.5. Motivation*
  - *2.5.1. Sense of ownership*
  - *2.5.2. Connection with the company*
  - *2.5.3. Personal believes*
  - *2.5.4. Personal values*
  - *2.5.5. Monetary reward*
  - *2.5.6. Rewards*
- *2.6. Management*
  - *2.6.1. Idea development*
  - *2.6.2. Management understanding and adaptability*
  - *2.6.3. Idea management*
  - *2.6.4. Leadership*
  - *2.6.5. Motivational approach*
  - *2.6.6. Support*
- *2.7. Organisation*
  - *2.7.1. Decision making*
  - *2.7.2. Inspirational leadership*
  - *2.7.3. Employee development*
  - *2.7.4. Sustainability practices*
  - *2.7.5. Employee participation and engagement*
  - *2.7.6. Sustainability strategy*
  - *2.7.7. Organisational support*
  - *2.7.8. Organisational culture*

3. Outcomes
- *3.1. Financial impact*
- *3.2. Organisational culture*
- *3.3. Compliance*
- *3.4. Strategic value*
- *3.5. Employee related*

Figure 3.2: Initial template

Final template This stage includes the reshaping of themes, the relocation of themes to different clusters, the introduction of new themes, and the elimination of unnecessary ones. Currently, the template is not modified after every new interview. As a general rule, the template should instead undergo one or two revisions before its final form. The template for this study was revised, resulting in the formation of second-level categories and some redefinition of first-level categories. For instance, the terms 'sustainability strategy' and 'sustainable practises' were merged into 'Sustainability approach' under the heading 'organisation'. This reclassification now encompasses both strategic and operational aspects of the organisation. The revised template is shown below, see figure 3.3

1. Defining
- *1.1. Voluntary participation*
- *1.2. Ordinary employees*
- *1.3. Innovation as an outcome*
- *1.4. Green impact*

2. Antecedents
- *2.1. Autonomy*
- *2.2. Network & collaborations*
  - *2.2.1. Collaborations*
  - *2.2.2. Network empowerment*
- *2.3. Communication*
  - *2.3.1. Promoting EDI*
  - *2.3.2. Promoting sustainability*
  - *2.3.3. Top-down communication*
- *2.4. Employee empowerment*
- *2.5. Stakeholder pressure*
  - *2.5.1. Investors demanding profit*
  - *2.5.2. Regulatory bodies*
- *2.6. Motivation*
  - *2.6.1. Intrinsic motivation*
    - *2.6.1.1. Sense of ownership*
    - *2.6.1.2. Connection with the company*
    - *2.6.1.3. Personal believes & values*
  - *2.6.2. Extrinsic motivation*
- *2.7. Managerial output*
  - *2.7.1. Manager's adaptability*
  - *2.7.2. Idea management*
  - *2.7.3. Manager's accessibility*
  - *2.7.4. Leadership & motivational approach*
  - *2.7.5. Employee recognition*
  - *2.7.6. Managerial support*
- *2.8. Organisation*
  - *2.8.1. Employee development*
  - *2.8.2. Employee participation and engagement*
  - *2.8.3. Sustainability approach*
  - *2.8.4. Organisational support*
  - *2.8.5. Organisational culture*

3. Outcomes
- *3.1. Organisational outcomes*
  - *3.1.1. Financial impact*
  - *3.1.2. Compliance*
  - *3.1.3. Enhanced idea generation and knowledge sharing*
  - *3.1.4. Organisational culture*
    - *3.1.4.1. Cultural shift within organisation*
    - *3.1.4.2. Identifying with organisation*
  - *3.1.5. Strategic value*
- *3.2. Employee outcomes*
  - *3.2.1. Employee development*
  - *3.2.2. Job satisfaction*
  - *3.2.3. Motivation*
- *3.3. Challenges*

Figure 3.3: Final template

Using the template to interpret the data The process of delineating themes and structuring them within a framework can be regarded as a method of data interpretation. However, it is insufficient to merely present the final template, encode all the data into it, and subsequently provide a summary of the content for each theme consecutively. This would lead to a lengthy presentation of findings that is likely to be tedious for readers. Additionally, it would not effectively communicate the key messages of your analysis pertaining to the research question. It is imperative to continue refining one's interpretation after completing the coding of all data.

To interpret the data effectively, a methodology focused on individual themes was selected. Here, each theme and its corresponding sub-categories are explored in detail throughout the results chapter. The primary themes, such as Defining EDGI, Antecedents of EDGI, and Outcomes of EDGI, were examined in-depth. This strategy was chosen to primarily concentrate on addressing the sub-research questions that contribute to answering the main research question. The topic of personal values and beliefs is incorporated into the discussion, as these could not be left out.

Writing-up In this research, the first method of presenting findings from template analysis studies was used, which entails organising findings around the thematic structure of the template, elaborating on

the significance of themes, and providing illustrative direct quotes from the data. This theme-by-theme approach is the most common because it effectively conveys the analysis's key findings in an efficient and well-organised manner (King et al., 2017). This method was chosen due to its compatibility with the study's objectives and limitations, despite the fact that it may not provide an accurate depiction of each participant's perspective. It necessitates a degree of discernment, with a focus on topics of the utmost importance, thus aligning with the requirement for prioritisation in such research studies. It is essential to note, however, that this approach does not provide an exhaustive representation of the perspectives of individual participants. The subsequent chapter, Chapter 4, contains the findings and analysis of the study.

4

Results

4.1. Defining Employee-driven Green Innovation

The first theme, which pertains to the definition of EDGI, is intended to address the first sub-research question posed in this thesis. During the course of conducting interviews, an exploratory approach was undertaken to ascertain the most appropriate definition for EDGI.

The results of the interviews identified four key factors related to EDGI. These are Voluntary participation, Ordinary employees, Innovation as outcome and Green impact. Each of these factors will be elaborated upon in the following subsections.

4.1.1. Voluntary Participation

After a comprehensive examination of the interviews, one-third of the 12 interviewees indicated they felt empowered and encouraged to propose their own ideas, reinforcing the notion of employee empowerment as shown by the statement made by Participant 11.

> ”*We are empowered to come up with ideas*” (P11)

The ability of employees to come up with, share and submit ideas emerged as a prominent indicator, as 9 out of 12 interviewees mentioned the freedom to submit their ideas, highlighting the significance of voluntary engagement in employee-led green innovation, as it signifies the absence of external pressure compelling individuals to generate ideas, which is confirmed by participant 3.

> “*I don’t think pushing will have a positive impact.* (P3)

The idea of voluntary participation extends further, with employees emphasising their autonomy in green innovative idea generation. Participants highlighted that they were not compelled to align with their manager’s thinking, offering another dimension to the concept of voluntary participation.

> ”*If I want to do something differently than what my manager says, that is completely fine.*” (P6)

Furthermore, Five participants highlighted the idea generation contest hosted by the organisation, these contests provide platforms or channels, such as special portals, through which employees ”could” sign up if they wanted to participate, as shown by Participant 1.

> ”*There is a special portal for it and then you can say what you like about it and you can also join the project group*” (P1)

Followed by Participant 3 talking about organised contests within his organisation.

> ”*in the previous role, there was some contest organised by the factory in topic X in efficiency*” (P3)

These findings make it clear that company-organised contests for sustainable idea generation are voluntary, with employees permitted to participate at their own choice. Furthermore, employees can share

ideas at any point in time with their higher-ups. Given this strong emphasis on employee empowerment, the freedom in idea generation, the flexibility to defy managerial direction, and the choice to engage in organisation idea generation contests, it becomes evident that these collectively constitute the essence of voluntary participation, which has also been defined by Kesting and Parm Ulhøi (2010) and Buhl et al. (2016) as a defining trait of EDGI.

4.1.2. Ordinary Employees

During the interviews, the prominence of inclusive idea-generation methods for green innovation in companies was noted. Standard improvement processes and idea boxes were commonly mentioned, emphasising that these platforms were accessible to all employees. This underscored that idea submission and participation in contests were open to everyone, creating a culture of inclusive green innovation, which is shown by Participant 1, who emphasises idea submission is a standard procedure.

> "*We actually have a very standard improvement proposal process, so operators can also suggest improvements*" (P1)

On top, Participant 3 provides additional details regarding the opportunity for all employees to submit innovative ideas.

> "*Anyone can present an idea*" (P3)

Consequently, the two quotes of participants 1 & 3 are towards the involvement of all employees within the company in the idea generation process. Participants 1 & 3 are two examples out of 19 codes relating to the involvement of the "ordinary employee", showing its significance. On top of this, Participant 6 emphasises the importance of innovation coming from employees in the idea-generation process.

> "*I believe that it is indeed crucial to expect innovations from employees.*" (P6)

The findings indicate that the inclusion of employees at all levels of the organisation, ranging from operators to management, is a crucial aspect of the EDGI concept. This observation is self-evident, as the EDGI concept itself begins with the involvement of employees. Nevertheless, it is imperative to not overlook this fundamental principle in the FMCG manufacturing industry.

4.1.3. Innovation as an Outcome

The interviews highlighted the active role played by employees in fostering green innovation within their respective organisations. One-third of the interviewees gave frequent examples of this intentional innovation which included: departmental quizzes, hackathons, and case studies, all of which are devoted to advancing green innovation.

> "*What is fairly common is that there are internal competitions, hackathons or collaborations in which it often does have a sustainable theme as an objective*" (P6)

Such accounts demonstrate that employees are not merely observers of green innovation. In fact, they are capable of actively contributing to the creation of environmentally sustainable outcomes. Consequently, what emphasises the intentional aspect is that people join these contests on their own account, actively pursuing green innovation.

Apart from intentional EDGI, there is another narrative that has been discussed in 8 out of the 12 interviews surpassing the intentional EDGI aspect which has only been discussed in 5 out of 12 interviews.

The responses provided by the interviewees indicated that EDGI frequently emerges as an unintended effect of EDI. Employees, with a primary focus on improving efficiency and cost reduction, unintentionally stimulate the development of environmentally friendly innovations. As a result, their innovative activities at improving operational efficiency also serve to advance sustainability, thereby strengthening the domain of environmentally conscious innovation, which is exemplified by Participant 1.

> "*I am 100 percent sure it was not conceived from a green point of view from those operators, but more from we make work easier.*" (P1)

As two-thirds of all the interviewees express the belief that efficiency and sustainability are closely interconnected as expressed by Participant 8, or mention sustainability is a side effect, which has led

to the argument that the unintentional nature of the phenomenon of EDGI is primarily attributed to the emphasis on innovation, specifically in terms of efficiency and cost reduction.

> "*It also does go hand in hand, doesn't it, Efficiency and Sustainability.*" (P8)

In conclusion, these results demonstrate that innovation is a crucial component of EDGI. It does not matter if the innovation is intentional, such as when employees participate in special green initiatives, or if it occurs unintentionally, such as when employees discover greener ways to perform their duties while focusing on time or cost reduction. Both approaches lead to green new ideas.

Therefore, innovation, whether intentional or unintentional, is crucial in EDGI. When employees are actively involved in making changes and discovering new ways to do things, more environmentally friendly solutions result. This can help raise the company's awareness of the importance of protecting the environment.

4.1.4. Green Impact

As stated in the previous section 4.1.3, EDGI is either intentional or unintentional green innovation. Two primal examples are made by interviewees 4 and 7 as examples, regardless of the intention EDGI inherently includes a green impact. Given that this is only one of ten similar instances shared by interviewees, the significance of this phenomenon cannot be excluded when defining it.

> "*I think that on itself contributes to less shipments, so less impact on the environment*" (P4)

> "*We are now initiating a project to check if we can make product X with all the leftover different X and we can sell so we don't throw everything away*" (P7)

According to the findings of the interviews, EDGI can be characterised by its recognition that all employees, whether they are operators or managers, can contribute innovative ideas. Important is their voluntary contribution, which can result in intentional or unintentional innovation based on their active contribution to sustainable innovation or if their innovation has a different focus but still makes a green innovative contribution, which leads to the final defining aspect of EDGI, which is the green impact of the employee's innovation. These results align with the definition given by Buhl et al. (2016) which also identified four key factors pertaining EDGI, these will be discussed more in the section 5.1. Furthermore, figure 4.1 is a visual representation of the factors that define EDGI.

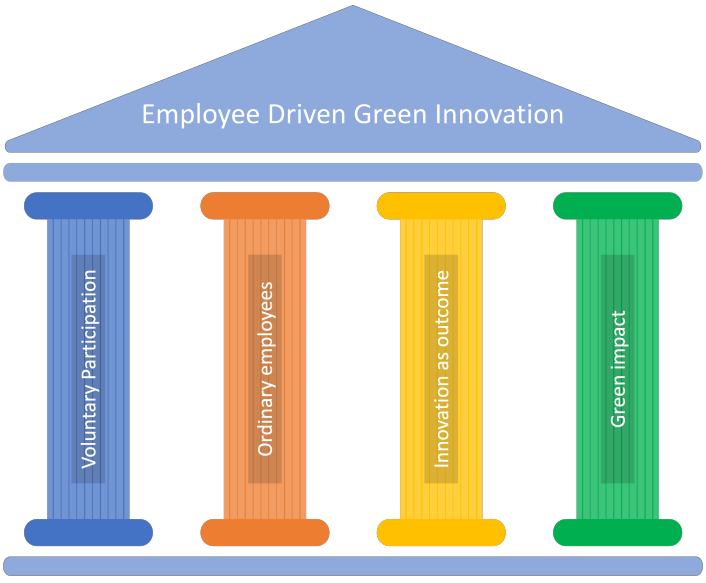

Figure 4.1: Defining EDGI factors

4.2. Antecedents

This section delves into the findings and presents the results related to the antecedents of EDGI. These antecedents are classified into eight distinct factors, each playing a unique role in fostering EDGI. They are as follows: Autonomy, Network & Community, Communication, Employee Empowerment, Stakeholder Pressure, Motivation, Managerial Output, and Organisational Factors. Each of these antecedents will be further elaborated upon in this section.

4.2.1. Autonomy

The interviews provided valuable insight into the perspectives and experiences of employees regarding the generation of sustainable ideas and following up with their ideas. The narratives included the concept of freedom in adaptable work practises, in decision-making, and a willingness to explore new ideas as shown by Participant 6.

> " *basically, I always have the freedom to do just come up with another innovation that I think of oh, but that has a slightly better addition in a different way*" (P6)

6 other interviewees had similar statements to this sentiment, indicating that they could readily pursue perceived improvements in addition to their core responsibilities, unrestricted by strict supervision or external control. As Participant 7 explains the effects autonomy gives her, showcasing what could happen when employees are given autonomy to work on their own behalf.

> "*For me, knowing that no one is looking into my fingers and doing what works best is what drives me to achieve the best results I can*" (P7)

The narratives underscore the importance of autonomy in employees' roles, which seems to encourage the creation and implementation of sustainable ideas. For instance, Participant 5 highlighted the value of having the freedom to lead one's own project to implement a sustainable innovative idea.

> "*good luck. You have these and these resources, build a project team and go do it.*" (P5)

This autonomy allows individuals to adjust work procedures, make decisions independently, and pursue unique opportunities for innovation. Therefore, it's clear that encouraging exploration, flexibility in work practices, and independent decision-making cultivates employee autonomy. This in turn allows employees to navigate more freely, fostering the generation of green innovative ideas, and highlighting the importance of autonomy in creating a conducive environment for EDGI.

4.2.2. Network & Community

Based on the findings, occurring in half of the interviews two factors were found important in explaining the antecedent of networks and communities, these will be elaborated on below.

Collaborative Environment

Throughout the interviews, it became apparent that organisations have observed the efficacy of these employees working together, as they routinely ensure that interdisciplinary teams work together in innovative initiatives, a good example is mentioned by Participant 1.

> "*Contest X is a type of competition where you can submit your idea as part of a multidisciplinary group.*" (P1)

This is further emphasised by Participant 6, who elaborates on how it's fairly common for these collaborative efforts to focus on a sustainability theme.

> "*What is fairly common is that there are internal competitions, hackathons or collaborations in which it is often a sustainable theme as an objective or a collaboration with another company, or that you really brainstorm in groups or individually how we can solve a problem*" (P6)

Within these particular settings, individuals within an organisation gather in order to exchange thoughts, utilise their combined knowledge and skills, and gain insights from a wide range of viewpoints. The utilisation of collaborative approaches, such as think tanks, group work, and partnerships with external organisations, facilitate the resources and exchange of ideas for employees. This facilitates the creation and improvement of solutions that prioritise sustainability.

> "*Let people connect with certain people and can create a group themselves, for example in the area of green innovation, that people will naturally connect there and there will automatically be some kind of cross-pollination of knowledge*" (P9)

The importance of collaboration within a company has been highlighted specifically in a third of all the interviews. When it was mentioned, it often went hand in hand with innovative contests, suggesting the significance of these joint efforts. Moreover, companies hosting idea-generation contests for multidisciplinary groups serve as an indicator of the critical role of collaboration. This significance brings us to the first factor known as the "Collaborative Environment." This environment encompasses various components such as collaboration, community, the significance of teamwork, knowledge sharing, and collaborations across different organisations.

Network Empowerment

Networks enrich collaboration while also creating a place where they foster a community which encourages idea-sharing. As Participant 9 noted, organisations should foster such networks, as they unite people, fostering a shared sense of community that boosts motivation.

> "*a platform to give ideas yes power as it were also so 100% sure that is a positive contribution provided you can find them so*" (P9)

Moreover, networks are enablers that inspire environmentally sustainable innovation. Which is the final factor in how networks increase EDGI. People who are new to sustainable development are given a push in the green direction by sustainable networks, which also provide a space for those who are already interested in sustainability empowering them.

> "*Company X positive theory vision has been rolled out and from that, therefore, per business unit all green teams have been created, so those are the people who really enjoy working on that and so indeed have those kinds of improvement proposals*" (P1)

In conclusion of network and communities, networks serve as effective platforms for fostering collaboration, fostering community, and promoting the exchange of ideas. They motivate and facilitate environmentally sustainable innovation. These networks provide both novices and experts in sustainable development with the necessary impetus and authority to foster green innovation. This emphasises the significance of actively promoting and cultivating such networks within organisations in order to foster EDGI.

4.2.3. Communication

Communication is at the base of EDGI, as good communication of targets, letting employees know that everyone can come up with ideas, promoting sustainability and showing the involvement by higher management. These four themes are being indicated as important in fostering EDGI

Promoting EDI

As findings show, companies are actively sharing with employees that they come up with innovative ideas, actively communicating the opportunity, fostering awareness among employees, making them feel empowered and free to contribute their innovative thoughts. Participant 1 emphasises that the organisation for which he or she works encourages employees to submit their ideas via general communication.

> "*General communication done about, know that you can always submit ideas.*" (P1)

Building on this, Participant 2 underscores the company's approach: before starting work, employees are consistently encouraged to be proactive and generate ideas.

> "*They actually say before, if they have confidence in you too, then they also quickly say yes, just go do it*" (P2)

As these quotes showcase the statements made by 2 of a total of five interviews emphasising the communication of being able to innovate, it, therefore, can be said that promoting EDI is of importance. This promotion of idea generation not only educates employees but also instils in them a sense of freedom and potential. It encourages their participation in the company's innovation initiatives. Therefore, EDI promotion is an antecedent for EDGI.

Promoting Sustainability

As companies' sustainability objectives are communicated at all organisational levels, a cascading effect occurs. Individuals throughout the organisation develop a sense of shared responsibility for achieving these sustainability goals. This phenomenon, mentioned by Participant 5, is known as "trickle-down," is a direct result of the company's emphasis on sustainability and can motivate employees to develop innovative eco-friendly solutions in accordance with these targets thereby facilitating the consolidation of resources and exchange of ideas.

> "*We do of course just have, because Company X communicates those external targets, which we have on sustainability, it then just becomes a kind of trickle-down responsibility.*" (P5)

Apart from Participant 5, there are 7 more instances whereby the communication of sustainability has been mentioned by interviewees. The sixth participant emphasises the importance of consistently communicating and promoting the organisation's sustainability message. This repeated communication process not only emphasises the significance of sustainability but also ensures that it remains a focal point for employees. This sustained emphasis has the potential to increase awareness, strengthen commitment, and inspire innovative sustainability-oriented thought.

> "*I think a big part of it is in repeating the message internally very often*" (P6)

EDGI is significantly influenced by the promotion of sustainability as part of communication. The promotion of sustainability through communication serves a dual purpose: it not only fosters a sense of shared responsibility but also ensures continued engagement with sustainability goals, thereby stimulating EDGI.

Top-down Communication

Upon conducting interviews and asking the question, "What do you need from your employer to effectively innovate in the domain of sustainability and environmental improvements?", the respondents shed light on a necessity.

> "*So that one of the directors for example or the CEO just does an introduction in a talk. We want to do this better.*" (P2)

Additionally, Interviewee 5 provided further insights into this topic.

> "*Then I'm glad that Name X, our director of Department X, comes along and says in the Netherlands: "These sustainable products X, it's fine if you get a bit less turnover for them than for all the products Y, because we want to get people to go in that direction".*" (P5)

Upon carefully analysing the interviews, 4 interviewees had similar comments, resulting in the imperative for top-down communication within the organisation. Such communication, initiated from the uppermost executive levels, cultivates an environment that incentivizes employees to engage in exploratory behaviours, risk-taking, and sustainable innovation. By delineating the strategic priorities associated with sustainability, it encourages employees to participate more actively in the realisation of the company's sustainability goals.

In conclusion, effective communication is crucial for fostering EDGI. Enhancing EDGI requires promoting individual innovation, emphasising sustainability objectives, and communicating from the top down. This type of strategic communication not only inspires employees to adopt sustainable practices and innovate for environmental improvement but also motivates them to do so.

4.2.4. Employee Empowerment

From the interviews, it emerges that when employees are allowed to play an active role in the implementation of their green ideas within an organisation, it enhances the sense of trust and personal responsibility they experience. This, in turn, nurtures a higher level of commitment and motivates them to push for the success of their ideas, as Participant 2 exemplified.

> "*then it also gives a very nice feeling when you can find something and actually do something with it*" (P2)

Allowing employees to be part of the realisation of their own ideas leads to the cultivation of a sense of ambassadorship. As Participant 9 pointed out, this not only facilitates the concept's implementation but also significantly enhances the employees' sense of worth, as they understand their suggestions have the potential to contribute meaningfully to the organisation. Thus, it can be inferred that allowing employees a significant role in the development and implementation of their ideas is a key precursor to EDGI.

> "*So you get ambassadorship and through that, you end up getting a piece of, Yes, pride*" (P9)

In addition to the active engagement of participants in the implementation of their own ideas, a tangible pattern was observed across seven interviews. The significance of implementing employees' ideas, specifically, actively incorporating their ideas, became evident. Participant 1 specifically mentioned the motivation it gave to him/her.

> "*Looking at my motivating factor. Well, at least it is that you see that something is being done with it and that there is also a result*" (P1)

The aforementioned factor was underscored as a notable stimulant for motivation as Participant 6 also emphasised the specific importance of seeing their idea being implemented.

> "*You make an innovation that it is more sustainable or improves something else in that sense and then you actually see the result*" (P6)

In conclusion, employee empowerment that is part of fostering EDGI is fostered through involvement in idea implementation, the cultivation of ambassadorship, and the realisation of employee suggestions. This participation not only instills a sense of trust and responsibility but also fosters a sense of pride, thereby enhancing the employees' sense of self-worth. When employees see their ideas put into action and yielding tangible results, their motivation increases. Collectively, these factors are an additional drive for green innovation by employees.

4.2.5. Stakeholder Pressure

As societal awareness of environmental issues grows, customers' demand for eco-friendly products and practices increases, necessitating a greater need for sustainable innovation on the part of the business in order to meet this demand. As Participant 4 explains, customer demand will decrease if companies are not environmentally sustainable.

> "*If a company is harming the environment, they won't buy their products.*" (P4)

Despite that the demand of customers is only mentioned in 25% of all interviews, they are an important stakeholder, as the awareness of customers with regards to sustainability will only increase in the future (McKinsey & Company, 2023).

Investors Demanding Profits

As organisations shift their focus to sustainability and green innovation, they frequently face resistance. This opposition is typically a result of the substantial up-front costs associated with green innovations and sustainable practices, which can temporarily reduce profits. Currently, many companies find themselves in a position where they must defend their green innovation initiatives against stakeholders who argue that the primary focus should be on revenue. This struggle is exemplified by the experiences of Participant 2.

> "*initially just turn revenue and make a profit for investors.*" (P2)

Participant 5 further elaborates on the tension that often arises between profitability and sustainability, highlighting the pressure exerted by investors on organisations.

> "*Just a listed company with shareholders who expect, demand profit margin. So you do very often notice the squeeze between what is the right thing to do, sustainability-wise, and what makes the most money*" (P5)

Five of the twelve interviews conducted identified investors as influential for the green innovation process. Nevertheless, it is evident that these innovations are not always correlated with immediate rev-

enue growth, posing a significant challenge for many businesses. The pressure from investors occurs, who anticipate robust quarterly financial performance, has a significant impact on the green innovation efforts of a company which in terms can result in a decrease in EDGI. This dynamic is an additional crucial aspect of stakeholder pressure, highlighting the intricate interplay between environmental sustainability and investor financial obligations.

Regulatory Bodies

Even when employees or organisations desire to advocate for more green innovation, they cannot always do so. Frequently, companies place investor interests, as stated in the previous section, and revenue growth ahead of environmental innovation, thereby marginalising it. According to the explanations of half of the interviewees, government bodies can sometimes stimulate this process in order to ensure that green innovation is not neglected.

> "*So, even if you have ambitious goals to become environmentally friendly if financial constraints become a barrier, most companies tend to prioritise financial considerations over environmental ones.*" (P2)

Government regulation was in 80% of the interviews that said something about government interference showcasing its significance mentioned and as having the greatest impact on the organisation itself; it was even mentioned, by participant 12, as the biggest driver outside of the company, because when businesses cannot sell or generate revenue, they are forced to adapt, which monetary incentives cannot do.

> "*Regulations and policies, I think that is the biggest driver that's outside of the company.*" (P12)

As organisations sometimes struggle for getting the amount of money needed for investments, it could be a possible solution whereby there is a monetary incentive. However, when asked what was more effective fingers pointed towards regulation.

> "*I would even say from a priority point of view, sanctions first and then the financial aspect*" (P12)

Nevertheless, monetary incentives by the government in the form of tax exemptions and subsidies can provide the necessary funds to make it possible to make the necessary changing towards more green innovation which in turn will lead to more EDGI.

> "*Monetary incentive is given by the government, to make the transition to X. Because yes, as you can understand with new technology, like this at the first year it is very expensive to use hardware Energy and the only way to make them Sustainable is to transpose as many people as possible to making Energy.*" (P8)

In addition to monetary incentives and government regulation, promotional activities can be a source of pressure. even though there are not as prominent, coming in only two interviews.

> "*From the government, campaigns about sugars are bad for you, that makes consumers look for after that. That makes a demand space.*" (P5)

These activities coincide with customer pressure because they could increase customer and employee awareness of sustainability. This compels businesses to respond to the rising demand. Keeping in mind the customer pressure, it is evident that this demand can motivate businesses to concentrate more on green innovation. Ultimately, increased customer demand results in increased revenue, which satisfies investors.

EDGI can be significantly impacted, either positively or negatively, by these perspectives, which include investors demanding profits, customers' demand and regulations requiring reduced emissions.

These three factors together can have a significant impact on EDGI, as they currently work against it or for it, such as investors causing a squeeze between profits and green innovative practices. Alternatively, regulations aimed at reducing emissions could support such innovation. These elements collectively serve as EDGI's antecedents.

4.2.6. Motivation

Motivation plays a critical and multifaceted role as an antecedent for EDGI. Not only are there signs of intrinsic motivation but also extrinsic, both of which this section will elaborate more.

Intrinsic Motivation

In the interviews, it became apparent that employees value being part of their own idea, and ensuring the success of their idea, whether they are related to sustainability or not. It is something that can motivate employees to innovate sustainably, assuming responsibility for their projects' environmental impact. Participant 9 further elaborated on this during the interview, responding to a follow-up question about additional effects that arise when employees are included in the implementation process of their green ideas.

> "*it's your own idea, yes, of course, I want to work on that and so nothing as powerful as an employee who can work on his own idea*" (P9)

This sense of ownership is what could motivate employees as they want to ensure the success of their projects when they feel ownership over their work.

> "*But it's also nice that you yourself can somewhat set a company's course sometimes*" (P1)

Next to that employees, such as Participant 1, were telling how much it motivated them when they saw they could help with steering the company through their ideas, even choosing a company based on the impact they could make on the world. Which is exemplified by Participant 5. This attributes to the sense of fulfilment employees experience from being able to effect meaningful change on a larger scale than if they were working for a startup, as well as from feeling like they can contribute to the company's future.

> "*If you can make a small impact on that, then in absolute quantity it just makes a lot of difference immediately and I think that's a big part of why people are driven to make an impact at Company X as well.*" (P5)

They feel a strong connection and alignment with their company's mission and values which are likely to be more intrinsically motivated, therefore the connection employees feel they have with their organisation could affect EDGI.

As shown by participant 3, indicating that regardless of anything employees are willing to improve or resolve problems within the company, showcasing the importance of values and beliefs. One could argue that this would be the same when a participant has strong beliefs and values with regard to sustainability consequently leading to GI or them coming up with ideas because of their active attitude towards sustainability

> "*I think whether they see something wrong or something that can be better, they will come with an idea*" (P3)

When asked the following question: "*What do you think motivates people to take these sustainability initiatives in your opinion?*" Participant 10, who has a managerial position, emphasised the significance of personal values and beliefs, confirming the argument made based on the aforementioned statement of Participant 3, why personal beliefs & values have an effect on EDGI. Further solidifying this aspect, one-third of the interviewees mentioned personal beliefs & values directly.

> "*I think that obviously the culture of the company, whether we see all day or vision or mission or targets it clearly defined and obviously the environment. I think by itself, you are environment conscious, I think that people are believing that OK, we need to do the right thing.*" (P10)

Sometimes employees innovate not out of personal beliefs but as they like to challenge themselves, four out of the twelve interviewees explained that they like to solve difficult problems and come up with innovative ideas, exemplified by Participant 7.

> "*I think it's about motivating me. Most is when I know that the process is not going well for a very long time and we keep trying to fix it, but it's not really working.*" (P7)

Employees' motivation to challenge themselves comes from within, making it clear that this is a prime instance of intrinsic motivation. As a result, self-challenge can be attributed to fostering EDGI, as employees desire to generate superior sustainable ideas.

In two-thirds of the interviews, it was evident that intrinsic motivation was motivating employees to participate in or come up with their own green idea generation. From these interviews, four factors emerged that, taken together, form the basis of intrinsic motivation. Challenging themselves, Connection with the company, Personal beliefs and values, and a sense of ownership are factors that motivate employees.

Extrinsic Motivation

In half of the interviews, it became apparent that organisations do not rely solely on the intrinsic motivation of employees. Some employees are more sensitive towards rewards in various ways, as exemplified by Participant 9.

> "*That can of course be done with a pat on the back, but if you realise a certain saving or create a certain value with your product, then if you can reward such an idea that also works very well with some employees who are more sensitive to that so monetary reward*" (P9)

On top of this, some idea generation contests offer rewards, such as capability training which for some employees can make them compete in the contest itself.

> "*There are some nice things indeed like for instance, you get training that you wouldn't otherwise get or at least some kind of fun outings. They are mostly a bit more capability aimed actually as a kind of reward.*" (P1)

Consequently, showing that employees are doing this not only with intrinsic motivation. In the company of Participant 2, there is a monthly best idea trophy which has been created by the company to motivate employees to come up with more ideas.

> "*Every month, for example, we have a sort of trophy that you can get if you come up with a good idea or make a good innovation.*" (P2)

Given that six participants mentioned rewards, it is a consistent theme throughout the interviews, demonstrating its significance. Although basic, its role in motivating employees to generate ideas cannot be overlooked, making it an antecedent. Rewards can be categorised under the broader term: extrinsic motivation of employees

Intrinsic and extrinsic motivations drive EDGI. Employees' personal beliefs, self-challenging and commitment to GI are all aspects of intrinsic motivation, driving EDGI. Next is extrinsic motivation, which encourages innovative employee behaviour by rewarding them with training or monetary incentives. These two types of motivation inspire and stimulate employees to pursue GI, making them crucial for EDGI in an organisation.

4.2.7. Managerial Output

Looking at the results, the effect of management on EDGI is the second largest antecedent in accordance to code sizes. Employees provided a clear message that management has an impact on several themes, including idea development facilitation, manager understanding and adaptability, idea management, management accessibility, leadership & motivational approach and support.

Manager's Adaptability

According to respondent 9, every employee requires a unique management style to generate the most ideas. That is strengthened by Participant 10, who emphasises the different maturity of employees. As 25% of interviewees explain the significance of managers understanding and adjusting their management style accordingly, it can be said that managers' understanding and adaptability foster the generation of green ideas.

> "*Before ideas arise, that obviously depends on each employee and differs that the one that is bubbling with ideas and the other you say of hey, do you have any ideas?*" (P9)

> "*Some of them are more mature than others about proposing or thinking about innovative solutions*" (P10)

Idea Management

Once an employee has made the effort to develop an idea and gathered the courage to present it to a manager, he or she is in a vulnerable position. Therefore, how a manager handles these ideas is crucial. Participant 3 explains how providing constructive feedback can significantly impact the development of ideas and motivate employees.

> "*if it doesn't get through and they explained to you why not? If that's a conversation thereof now, what with your proposing is not realistic, because this point and this point.*" (P3)

It is essential for managers to provide constructive feedback, as it influences both the quality of the ideas and the employees' motivation to continue generating new ones. Furthermore, transparency regarding a bad idea is important because it can provide employees with direction, as noted by Participant 9, resulting in the importance of idea management by managers.

> "*Then you also have to be honest about that, because then you are in that preliminary phase with the ideas so you have to be serious about it, and provide feedback*" (P9)

Manager's Accessibility

As touched upon in the previous paragraph, feedback from managers on employee ideas is crucial. But before this feedback can occur, employees need the opportunity to present their ideas to the leadership team. As Participant 3, an employee, tells his/her manager is always open and easy to talk to.

> "*I always can reach to the engineering director from my area from and we collect central technical services, please. He's available in teams, so I always can drop a message and the same for the people in the factory, doors can work to the, to the even to the plant director and tell you listening.*" (P3)

As shown by Participant 8, a manager, organisations strive to have management teams that are always open to feedback or new ideas from employees.

> "*Ultimately, we are always open to feedback from operators or anyone within the company*" (P8)

A low threshold for communicating with managers increases the comfort and ease with which employees can share their ideas, which can lead to more frequent and creative ideas. It is also essential to ensure that employees have no fear of being turned down or ridiculed when they share their ideas. As Participant 10 tries to emphasise in his daily routines.

> "*To come up and to not be afraid and to voice*" (P10)

The openness of the management, both in terms of attitude and procedures, is another crucial factor which in total was mentioned by 7 different interviewees. It enables the smooth presentation of ideas to management, reduces perceived resistance, and facilitates a steady flow of creative ideas. When management is receptive to employee suggestions, it fosters a sense of worth and belonging among employees, thereby increasing their motivation to contribute to the organisation's green innovation initiatives.

Leadership & Motivational approach

7 out of the 12 interviews had similar comments in which they emphasise the personal commitment and proactive stance of managers and higher-up teams, showcasing their drive for sustainability. As Participant 4 enthusiastically noted.

> "*our plant manager, he is really focused now, I think, just by his own motivation to get our factory to zero waste or zero emissions*" (P4)

The enthusiasm in the voice of participant four showed the motivation it gave, indicating its presence of leadership. Participant 5 presents an instance where the leadership team is not merely receptive to innovative concepts but actively participates in their trial and implementation, an example of a coaching leadership approach coupled with positive reinforcement from the leadership team.

> "*the whole X leadership team tried my idea and were very excited about it and then took this into consumer concept testing.*" (P5)

Similarly to Participant 5, Participant 6 emphasises the pervasive dialogue on sustainability among the senior leadership, including the CEO, underlining the passion of the leadership team for sustainability.

> "*Really more senior leadership, so really CEO or 1, 2 levels below that. There is almost no story they give in which they are not talking about sustainability*" (P6)

Finally, Participant 8 underscores the importance of positive motivation from the leadership, pushing the sustainability narrative as a crucial company ethos, showcasing direction and also understanding the needs of every employee. This underlines the practices of situational leadership and change management, which is reinforced by Participant 9.

> "*It is absolutely important that we motivate everyone as much as possible and bring the direction certain image of okay, Sustainability is an important concept that we support as a company*" (P8)

This situational leadership is essential for managing different employees as it allows leaders to adapt their approach based on the situation and the individuals involved. It enables leaders to provide the necessary guidance or autonomy based on the task at hand, thereby fostering an environment conducive to GI.

> "*but a small bit focused on situational leadership. So there are all theories around leadership, but basically sensing what does that employee need in order to come to maturity, both with themselves*" (P9)

Collectively, these narratives demonstrate the decisive influence of leadership and management styles in fostering a culture of sustainability within organisations.

Employee Recognition

In the interviews conducted, a consistent theme emerged. Eight out of twelve employees emphasised the engaging response they received from management when they submitted an idea. The serious consideration given by management to their ideas not only validated their contributions but also served as motivation. This encouraged them to persist with their idea, as exemplified by the experience of Participant 2.

> "if you just come up with a realistic idea, which is really going to help and work, then it really does get taken seriously and then you really have pretty few boundaries that you have to cross to get something through actually." (P2)

Likewise, Participant 6 explicitly underscores the importance of recognition of ideas generated.

> "*Yes, recognition I think is part of it*" (P6)

The participants in the study have demonstrated that management includes multiple facets. As idea management primarily centres on soliciting feedback to refine and determine the course of action for an idea. On the other hand, employee recognition primarily aims to motivate employees. This aspect holds significant importance, as previously mentioned, with two-thirds of the employees highlighting it as a motivating factor for generating green innovative ideas.

Managerial Support

10 out of the 12 Participants talked about this factor within the realm of management in EDGI. Consistently, this was emphasised the most of management factors during interviews, both from the employees' and managers' perspectives. Employees often generate green innovative ideas, but not all of these ideas are accepted by the organisation. Employees could lose motivation because of this rejection. But, as Participant 2 pointed out, in this situation, the role of a manager becomes very important.

> "*I think that's where you can use support from your managers who then say, yes, it doesn't matter, we'll move on again, let's go*" (P2)

Employees have said that support from management has a big effect on how enthusiastic they are to come up with ideas that will last. Importantly, this support is still important even when their ideas aren't accepted right away. This shows how important it is for management to keep and encourage employee motivation for sustainable innovation.

"*really support from higher management would mean a lot for me.*" (P4)

As for managers when asked about the significance of their support in promoting EDGI, there was a concise line throughout the interviews regarding its significance. As managers recognise their crucial role in fostering and facilitating GI by employees.

"*I'm here is to support people with those ideas and those behaviours, because sometimes you can have a really nice idea, but you don't have the time for analyse it*" (P10)

As both managers and employees have emphasised, managerial support plays a pivotal role in determining the trajectory of a green innovative idea; it can either propel or stifle it. Therefore, the existence of such support within the organisation is essential if there is to be an increase in the number of ideas generated. Even if their ideas fall short of initial expectations, employees are more likely to be engaged and motivated in their green innovative endeavours when they feel supported. Therefore, managerial support emerges as a crucial antecedent of EDGI.

4.2.8. Organisational Factors

It has been determined that the organisation is the most influential factor in promoting EDGI. It has been divided into eight distinct themes, each with a distinct organisational angle.

Employee Development

As became apparent through 5 of the 12 interviews, companies are emphasising training the employees and raising awareness. Participant 5 explained their company created an academy to not only train but also make the employee aware of the current societal problems, as well as environmental.

"*such an academy it is meant to raise awareness of the problems, the issues in the organisation so that the leadership of the future can make the right choice*" (P5)

Moreover, identifying and cultivating 'employee talent' is an additional crucial factor. GI can be advanced through the identification, support, and development of employees with a particular skill or interest in sustainability. The ninth participant emphasises the significance of employee development. He suggests that providing opportunities for employees to develop their skill sets can not only benefit the organisation but also boost overall performance. Specifically, asserting that an increase in development towards an employee's sustainability knowledge could result in an increase of EDGI.

"*sometimes, as an organisation, you don't see where you can innovate, an employee has a certain talent and a certain train of thought, an idea with which he or she can do very well for the organisation*" (P9)

Similarly, Participant 6 emphasises the existence of internal training programmes, indicating that organisations recognise the benefits of investing in their employee's growth.

"*Furthermore, internal training is also given.*" (P6)

As Participant 7 stated, participation in the EDGI process demonstrates the iterative nature of innovation, in which each attempt, whether successful or unsuccessful, yields valuable insights that have contributed to the development of skills that can be applied to future endeavours.

"*it's really nice to create ideas and I think you can learn from it*" (P7)

Consequently, fostering a culture that values continuous improvement and learning can stimulate GI significantly. This is also confirmed by Participant 3, indicating that if given the opportunity, employees can learn from the green idea generation process.

"*People can also learn from that, improve the initial idea, maybe, and come with a newer one that doesn't have the inconvenience of the first one.*" (P3)

Organisations that prioritise employee development and sustainability awareness can achieve two essential objectives: enhancing the capabilities of their workforce and motivating employees to contribute to the achievement of sustainability objectives. This not only encourages EDGI but also instils a robust sustainability culture within the organisation. Employee Development, as a key organisational

antecedent, is instrumental in promoting EDGI. The value of initiatives such as academies and internal training programmes plays a crucial role in fostering a culture rooted in sustainable practises and fostering a profound understanding of the significance of sustainability.

Employee Participation and Engagement

According to participants 5 and 6, organisations are facilitating activities such as case studies, internal contests, hackathons, and collaborations, often centred around the theme of sustainability, to engage employees voluntarily.

> "*Because I worked for Department x, I worked on the case for Plant-Based products*" (P5)

> "*What is fairly common is that there are internal competitions, hackathons or collaborations in which it often does have a sustainable theme as an objective*" (P6)

These initiatives provide a forum for employees to contribute their ideas, fostering a sense of ownership and dedication to the organisation's sustainability objectives. They foster inventiveness, problem-solving, and, most importantly, an environment in which employees can participate conducive to sustainable innovation in the FMCG industry. Innovative initiatives such as internal contests, sustainable hackathons, and collaborative sustainability-focused projects have proven to be effective engagement tools in this context as 7 out of 12 employees mentioned they have participated, therefore this is an important antecedent in leading to EDGI.

Sustainability Approach

According to Participant 2 aligning operations and procedures to prioritise sustainability within an organisation are of explaining that if the organisation says A and managers want to execute B, employees will follow their manager, already indicating the importance of a clear line.

> "*Look, the management can release a message saying, Yes, we find it very important that you focus on sustainability and green innovation." But if your manager then says, No, I don't find that important. You should do this and this first, well, then I will do that because ultimately, you are evaluated by your manager.*" (P2)

Adding to the statement, the second participant emphasised the significance of a well-established green thread throughout the organisation, emphasising the need for a unified approach to sustainability.

> "*it is very important that it really goes through the whole company as a, in this case, green thread*" (P2)

Participant 12 confirmed Participant 2 his/her view, emphasising the importance of establishing a solid sustainability baseline within the organisation. They argued that this baseline promotes cohesion within the organisation, making sustainability a central, unified objective. This unified approach, in which sustainability is given equal weight across the organisation, contributes to EDGI, stimulating green initiatives and sustainable practices at all levels of the organisation.

> "*I think the company itself needs to make sure that the baseline is there, I'm saying it because, It's not that they are not accepting individual beliefs, but the problem is they're just not being taken on us the same weight.*" (P12)

Furthermore, a well-defined organisational vision with a road map, especially one centred on sustainability, can influence employee behaviour positively. One-third of the interviewees demonstrate the weight organisation place on establishing a vision as one-third of the interviewees mention the sustainable vision of their company, indicating the impact it has left on them, showing employees that the company is willing to put make less profit to reduce their environmental footprint which is part of the vision of company X of participants 5.

> "*I am very happy, though, that we work for such a company that dares to make those kinds of choices, including in the wallet, to get us in that direction anyway.*" (P5)

Participant 6's company weaves sustainability into their strategic vision, aligning business goals with environmental responsibility. Showing that employees acknowledge this commitment, reflecting the company's success in fostering EDGI

> "*So, they place a strong focus on sustainability with the vision that there is only one world, and if it deteriorates, our company will suffer as well. Therefore, they recognise the importance of integrating sustainability into their practices to ensure the long-term success and viability of the business.*" (P6)

As organisations create a vision, part of this are KPI's which are mentioned to become more and more important, demonstrating that employees will be pushed to come up with sustainable ideas

> "*In that regard, sustainability is also considered a Key Performance Indicator (KPI), which means that any improvements or initiatives must demonstrate that they are better than the previous state. If the proposed changes do not meet the standards set by higher management, they may not be approved.*" (P1)

In addition to a sustainable strategy is the actual implementation and execution of these strategies which are found of critical importance as emphasised by Participant 9. This phase of implementation demonstrates to employees that the organisation's commitment to sustainability is genuine and substantive, and not just empty rhetoric or "greenwashing."

> "*we finish things, we live up to our vision that we express by seriously doing something with your ideas and therein the results* " (P9)

Participant 8 emphasises the significance of incorporating sustainability as a company pillar, a sentiment that is backed up by Participant 12. The presence of these pillars is integral to the implementation of sustainable practises, which consequently facilitates the emergence of EDGI by promoting a sense of purpose and cultivating a shared organisational culture.

> "*It is an important company pillar for us*" (P8)

> "*That initiative on these first three pillars to the focus on sustainability.*" (P12)

In conclusion, successful EDGI requires a unified sustainability strategy and practises. Managerial alignment with sustainability messages is crucial, as it eliminates confusion and enhances employee engagement in green initiatives.

A well-established sustainability baseline integrates sustainable practices throughout the organisation, propelling the growth of EDGI. Moreover, a well-articulated organisational vision and strategy that integrates sustainability as a Key Performance Indicator (KPI) fosters a sense of purpose and shapes positive employee behaviour.

Incorporating sustainability as a company pillar further facilitates EDGI by promoting a shared organisational culture. Thus, a mix of effective sustainability strategies and practices is crucial in nurturing employees to become agents of green innovation, leading to a more sustainable future.

Organisational Support

During the course of the interviews, a notable trend emerged wherein employees placed significant emphasis on the response of organisations towards their ideas and the subsequent impact on their motivation. This emphasis extended beyond management and encompassed the organisation as a whole. The manifestation of organisational disregard for ideas is evidenced by the emergence of employee-generated ideas, as exemplified by Participant 3.

> "*if the organisation is not interested for sure the ideas will stop eventually because you have the feeling that the organisation is not listening to you on that point, so you are not going to waste your energy into thinking about improvements.*" (P3)

Continuing the conversation on organisational disregard, it has been verified that when organisations demonstrate pride, employees are more inclined to feel motivated to participate. This highlights the correlation between organisational support for employees and their increased willingness to actively contribute to idea generation.

> "*when you think of a clever solution that the company hasn't thought of, it also will get supported and will get noticed and they will be proud of it.*" (P4)

In the testimonies of eight interviewees, they explained that when employees came up with a viable idea the organisations who reacted positively told them they would make resources available so they could continue with their product which is shown by Participant 4. Enabling the involvement of employees, motivating and demonstrating to all that if you have a good idea, there will be resources available.

> "*You have these and these resources, build a project team and go do it.*" (P4)

Participant 8 provides additional evidence to support the notion that the availability of resources plays an important role in organisational support.

> "*give the resources and tools when someone comes up with a good idea so that they can actually implement something.*" (P8)

As the significant impact of organisational support on the development of EDGI is highlighted. The reciprocal relationship between an organisation's acceptance of employee ideas and employees' motivation to innovate was a recurring theme throughout the interviews.

Notably, the perception that organisations disregard ideas can dampen employee enthusiasm and discourage them from contributing innovative solutions. Employees are more motivated and feel valued when organisations demonstrate appreciation for unique solutions and provide the resources necessary for their implementation.

Thus, it is crucial for organisations to establish an environment that values employee input, and provides the resources to implement viable solutions. This supportive and encouraging environment will stimulate the development of EDGI.

Organisational Culture

Upon analysis of the responses provided by 5 out of the 12 interviewees, it became evident that there was a unanimous emphasis placed on a particular aspect, indicating its significant role in promoting the concept of EDGI. This particular aspect is of importance as participants 2,10 & 12 all mentioned it. This prompted me to inquire further into the composition of the topic.

> "*I do think culture is really the most important*" (P2)

> "*most important part is the culture*" (P10)

> "*I think culture is important*" (P12)

Notably, one-third of the participants emphasised that within the organisation, they experienced a sense of freedom in expressing their thoughts and opinions, as exemplified by Participant 3, resulting in being more inclined to make come up with improvements to various aspects of sustainability.

> "*There's an open policy for everyone to come with some ideas to improve the IT, can be an idea to improve the process, to go greener*" (P3)

Participant 10 with a managerial role emphasises the importance of fostering a culture where every employee feels comfortable sharing ideas, regardless of how conventional or novel they may be. Such an environment is fundamental to an organisation's innovative capabilities, as it fosters EDGI at every level of support.

> "*It's an open space, so you don't really need to be that smart or come within any crazy business case.*" (P10)

The findings also highlighted the prevalence of a supportive team environment, wherein each team member experienced a sense of ease in voicing their perspectives, which is emphasised by Participant 7. This culture promotes openness and inclusivity, and has a positive effect on EDGI, as employees feel more encouraged as mentioned in section 4.2.7.

> "*we have really created a team where everyone dares to speak their mind*" (P7)

Building upon the notion of a fostering team environment and open culture, the establishment of an environment wherein all aspects surrounding employees are oriented towards sustainability has a consequential influence on their behavioural patterns, as expressed by Participant 10. Increasing individ-

uals' awareness of the environment and emphasising the potential for small actions to have significant consequences. This can also be placed under workplace behaviours.

> "*So those are things that are applicable to the workplace that are having an impact, that positive impact. And then we are immersed in those kinds of things. We know that then there is a reason for everything and always we can do something*" (P10)

The findings shed light on a potential correlation between an open culture and acceptance of failures. Based on the statement of Participant 5, this particular cultural context perceives failures not merely as obstacles, but rather as occasions for acquiring knowledge and skills, thereby cultivating an atmosphere that promotes the undertaking of risks and experimentation, both of which are fundamental components of fostering innovation. aligns with what is

> "*that at least you create a kind of environment where people do feel the opportunity to just try something and if it fails then it's totally fine and there is a positive reaction to that when you try something and it fails.*" (P5)

The response provided by Participant 6 exhibited a strong alignment with the notion of a "fearless organisation," wherein the inhibition caused by the fear of failure does not impede the generation of innovative ideas. This suggests that such an approach may be prevalent within their respective organisations.

> "*And there is also absolutely no pressure if, for example, something goes wrong, it's a bit of the fearless organisation*" (P6)

Culture is about more than just the free exchange of ideas; it's also about ensuring that employees feel included from the start. Involving employees in the first step of any process fosters a sense of ownership and participation, which can increase motivation and stimulate innovation. In addition, listening to individual feedback and maintaining an open policy for idea generation contribute to the development of a dynamic, inventive environment.

> "*If you simultaneously start from step 1 or step 0, or let innovation come from multiple areas within the organisation, or at least collaborate with multiple people from completely different teams, then you ensure that it has support from different branches of the organisation and at the same time, they feel a sense of value in actually implementing it and keeping it in the long term.*" (P6)

The findings of the interviews underscore the importance of organisational culture in promoting environmentally innovative ideas, as evidenced by its consistent presence in coming forth in every interview conducted. an essential aspect of fostering a conducive environment is ensuring that employees have the liberty to articulate their ideas without apprehension. The presence of freedom, in conjunction with a cultural environment that fosters the generation of ideas and embraces the possibility of failure, embodies the fundamental characteristics of an atmosphere conducive to green innovation. Therefore, the presence of an inclusive and supportive organisational culture has a substantial influence on EDGI. This type of organisational culture facilitates the active involvement of employees in the innovation process and establishes a conducive environment for effectively harnessing EDGI.

Summarising the antecedents found through the conducted interviews. These can be divided into 8 themes, with each their own aspects. These themes are in ascending order based on the frequency of codes: Autonomy, network & communities, communication, employee empowerment, stakeholder pressure, motivation, management and organisation.

The chart 4.2 below is constructed based on the frequency of codes per theme across different categories. Based on the analysis of the chart, it is possible to make an assumption by assigning weight to each category based on the frequency. Based on this assumption, the analysis reveals that organisational factors emerge as the most significant antecedent for EDGI, followed by managerial output. These two factors collectively account for 56% of the total frequency of codes.

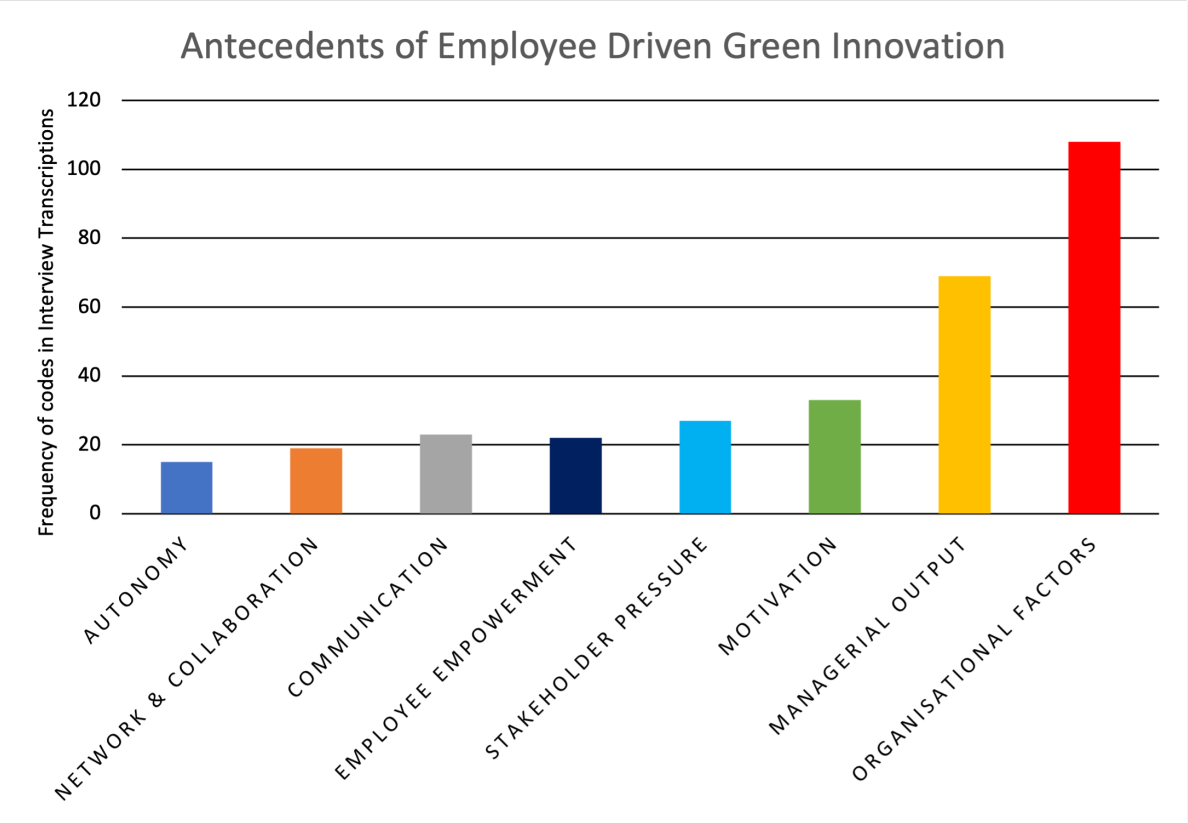

Figure 4.2: Overview Antecedents of EDGI

Autonomy Focuses on the freedom to modify work procedures, make independent decisions, and explore novel opportunities, which in turn add to EDGI

Network & Community As the collaborative environment, together with network empowerment was found to be of essence in fostering EDGI. As employees collaborate, knowledge sharing takes place and a sense of community is created, it is therefore also important that

Communication Communication is made up of three aspects, found important for EDGI, these are: Promoting EDI, Promoting sustainability & top-down communication. Actively promoting EDI fosters awareness among employees and encourages them to contribute innovative thoughts. This promotion not only educates employees but also creates a sense of freedom and potential, encouraging participation in innovation initiatives. Promoting sustainability is crucial, as it fosters a cascading effect of shared responsibility for achieving sustainability goals. Consistent communication of the organisation's sustainability message increases awareness, strengthens commitment, and inspires innovative sustainability-oriented thought. Top-down communication is essential for effective innovation in sustainability and environmental improvements.

Employee Empowerment Employee empowerment in fostering EDGI involves involvement in idea implementation, ambassadorship, and suggestions realisation. This fosters trust, responsibility, pride, and self-worth. When ideas are implemented and tangible results are achieved, motivation increases, driving green innovation.

Stakeholder Pressure As societal awareness of environmental issues increases, customers' demand for eco-friendly products and practices increases, necessitating a greater need for sustainable innovation. However, companies often face resistance from investors demanding profits due to the substantial up-front costs associated with green innovations and sustainable practices. Government bodies can sometimes stimulate the green innovation process, with monetary incentives like tax exemptions and subsidies that can provide necessary funds for green innovation. Promotional activities, such as campaigns about sugars, can increase customer and employee awareness of sustainability, motivating businesses to focus more on green innovation. These factors can significantly impact EDGI, either positively or negatively, as they work against or for it. Regulations aimed at reducing emissions could support such innovation.

Motivation Motivation can be subdivided into 2 themes, intrinsic & extrinsic.

Intrinsic motivation is a key factor in motivating employees to innovate sustainably, as it allows them to take responsibility for their projects' environmental impact. Employees value being part of their own ideas and ensuring the success of their projects. A sense of ownership, connection with the company's mission and values, and a sense of ownership are also factors that motivate employees. Personal values and beliefs also play a significant role in fostering EDGI, as employees are willing to improve or resolve problems within the company.

Extrinsic motivation is another key factor in motivating employees to participate in or come up with their own green idea generation. Organisations do not rely solely on intrinsic motivation, as some employees are more sensitive to rewards, such as monetary rewards or capability training. Rewards can be categorised under the broader term of extrinsic motivation, which encourages innovative employee behaviour by rewarding them with training or monetary incentives. These two types of motivations inspire and stimulate employees to pursue green innovation, making them crucial for EDGI in an organisation.

Managerial output Managerial output is influenced by several factors, each with its own significance, as illustrated in 4.3, which is based on the frequency of codes under each factor. These factors; the manager's adaptability, being the first, is important given the diverse nature of employees and the varied maturity levels of these employees significantly influence the generation of green ideas. Secondly, idea management, Managers should provide constructive feedback, maintain honesty, and remain open to new ideas in order to motivate employees. Manager's accessibility, both in terms of attitude and procedures, enables the smooth presentation of ideas, reduces perceived resistance, and facilitates a steady flow of creative ideas.

Leadership and motivational approach are also essential for fostering a culture of sustainability within organisations. Managers should be proactive, receptive to new ideas, and actively participate in their trials and implementation. Positive motivation from leadership is crucial for showcasing direction and understanding the needs of employees.

Employee recognition is another important factor in generating green innovative ideas. Managers should be aware of the challenges faced by employees, as not all ideas are accepted by the organisation. Managerial support is crucial in ensuring that employees' ideas are accepted and that they are motivated to contribute to the organisation's green innovation initiatives. Managerial support is crucial for fostering sustainable innovation and facilitating green innovation among employees. It helps employees come up with lasting ideas and encourages motivation for sustainable practices.

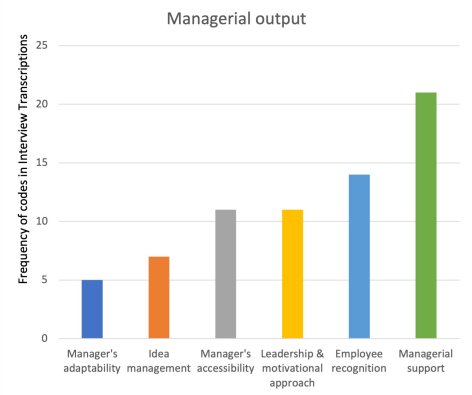

Figure 4.3: Overview Managerial output of EDGI

Managers play a pivotal role in determining the trajectory of
green innovative ideas, ensuring increased idea generation and employee engagement.

Organisational Factors This section discussed the importance of organisational factors in promoting EDGI. The key themes identified are employee development, employee participation and engagement, the sustainability approach, organisational support and culture. Figure 4.4 displays the number of codes per factor, providing an overview of their respective impact on the antecedent organisational factors of EDGI.

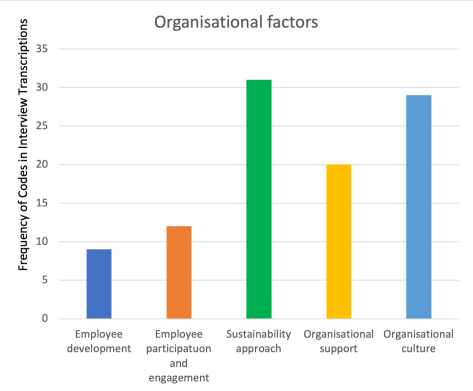

Figure 4.4: Overview Organisational factors of EDGI

Employee development was underscored as crucial to EDGI, with many companies investing in training and awareness programmes to instill sustainability knowledge in their workforce. Employees who have skills or interests in sustainability are identified and nurtured, fostering green innovation. Moreover, the organisations encourage a culture of continuous learning and improvement, which significantly stimulates green innovation.

In terms of employee participation and engagement, organisations engage employees voluntarily through various activities such as case studies, internal contests, hackathons, and collaborations centred around sustainability. These initiatives foster inventiveness, problem-solving, and create an environment conducive to sustainable innovation.

The sustainability approach within an organisation plays a significant role in EDGI. It is important that there is alignment between management's messaging and actions. The importance of a clear sustainability strategy is emphasised, with one that's centred on a well-established sustainability baseline, integrated into the organisational vision, and incorporated as a KPI. This strategy must be effectively implemented, demonstrating the organisation's genuine commitment to sustainability and not just "greenwashing."

In terms of organisational support, employees value how their organisations respond to their ideas, which significantly impacts their motivation. The more positive the response, the higher the likelihood of employees contributing more innovative ideas. Employee testimonies reveal that an organisation's acknowledgement and pride in their ideas and their willingness to provide resources for their implementation make employees feel valued and motivated. On the other hand, a perceived lack of interest can deter employees from suggesting improvements or innovative ideas. Hence, it is essential for organisations to value employee input and provide the necessary resources to foster a supportive environment conducive to EDGI.

Regarding organisational culture, an environment that promotes openness, inclusivity, and the acceptance of failures significantly influences EDGI. The interviewed employees highlighted the importance of a culture that allows them to express their thoughts and ideas freely, resulting in more innovative contributions. This open culture extends to allowing failures, as they're viewed as learning opportunities rather than obstacles, fostering an atmosphere of risk-taking and experimentation essential for innovation. Involving employees from the start, maintaining open policies for idea generation, and encouraging collaboration across teams are also important for fostering a dynamic, inventive environment.

4.3. Outcomes

Based on the findings, the outcomes have been divided into two distinct categories: organisational outcomes and employee outcomes. Subsequently, the challenges associated with EDGI are discussed. In this section all three will be further elaborated on. The outcomes are classified as 'expected outcomes'. Since some organisations of the interviewees have not yet adopted EDGI, it was decided to classify both potential and currently observed outcomes under 'expected outcomes' class to avoid confusion.

4.3.1. Organisational outcomes

In evaluating the findings, organisational outcomes were the most prominent result, which is based on, this category having the highest number of codes assigned to it. This section is essential for analysing the effects of the various aspects of the research on the organisation as a whole. The relevance of each subcategory was determined based on its impact on the organisation, resulting in alignment with organisational outcomes. These subcategories then provided a nuanced understanding of the various influences on the organisation and allowed for a thorough evaluation of their respective effects.

Financial impact

As described by four interviewees, the capacity for organisations to be able to keep up with increased demand by fostering EDGI. As more consumers place more importance on sustainability, innovations that affect a company's green credentials can attract a larger customer base, resulting in an increase in revenue. Participant 4 confirms this perspective, elucidating on the relationship between company practices and the attitudes of their young target audience, particularly those belonging to Generation Z, the consumers of the future.

> "*The company I work for is their audience or their target group is quite young. I think it's Generation Z, if I'm not mistaken and I think they should be aware and they are also aware now that these people really are active about the environment. If a company is harming the environment, they won't buy their products.*" (P4)

In addition to increased sales, EDGI can also lead to cost reductions. Sustainable innovations frequently involve resource efficiency, which could result in lower long-term production costs, providing a direct financial incentive to pursue such initiatives, which was stated by Participant 5.

> " *All those Dutch people who still want to enjoy tasty meat, you can't simply switch them over to all vegetarian products. This is also related to Economies of Scale, which you're probably familiar with. Meat products, for example, are often still cheaper to produce than vegetarian products.*" (P5)

Enhanced shareholder value is an additional important financial result of EDGI. Shareholders are becoming increasingly aware of the long-term risks posed by environmental challenges, and companies that demonstrate a commitment to sustainability through green innovations typically enjoy a premium in the market and will adhere to more customer demand resulting in added shareholder value. Both Participants 4 & 9, state the increased shareholder value as outcomes of EDGI. This phenomenon demonstrates the increasing significance of sustainable business practices in enhancing the value of a company.

> "*For them it also creates in the long term more shareholder value*" (P4)

> "*So even on the side, that adds value and that in turn ultimately adds value to a piece of shareholders. Value Naturally*" (P9)

In conclusion, the financial effects of EDGI are multifaceted and significant, ranging from contributing to demand and financial gains to providing financial incentives and boosting shareholder value. Employee-driven commitment to sustainability and green innovation is supported by these results.

Compliance

According to the statements made by Participant 12, external factors such as regulations and policies serve as the main drivers influencing the green innovative activities of the organisation, EDGI has the capacity to comply with potential sustainable regulations, as indicated by the outcomes of our analysis.

> "*Regulations and policies, I think that is the biggest driver that's outside of the company.*" (P12)

This capacity for compliance is further confirmed by Participant 4, who discussed how implementing an innovative solution on effiency, referred to as 'X', assisted the organisation in adhering to governmental regulations.

> "*We installed a new X which is way more efficient than the older one. So that's done because it had to be done because the older one had to go out but it's also done because I think of environmental regulations by the Location X government*" (P4)

When employees are involved in green innovation, not only does the organisation benefit from their creativity and problem-solving abilities, but it is also better equipped to navigate the complex landscape of sustainability-related regulations and policies.

According to Participant P6, modern investors increasingly consider sustainability when making investment decisions.

> "*And shareholders also consider it very important.*" (P6)

Participant P5 elaborates further, stating that organisations must demonstrate accountability to their investors which sometimes hinders the implementation of sustainable practices.

> "*We still have those shareholders, unfortunately, to whom we have to be accountable.*" (P5)

The implementation of EDGI allows organisations to effectively meet investor demands by showcasing a strong dedication to sustainable practices.

Enhanced idea generation and knowledge expansion

Participant 10 alongside 3 other interviewees, of which half of the total has a managerial function emphasises the importance of the the inclusion of employees in the green innovation process due to their firsthand knowledge and unique insights into the operations of the organisation, this experience of employees could also be referred to as tacit knowledge.

> "*We can really implement things that are coming from people that know how these things are being managed in the field.*" (P10)

Participant 3 affirms this, underlining that employees, due to their daily involvement, possess invaluable knowledge.

> "*the people that that's running the line for example, they have the most knowledge rate, they're going to have more knowledge about what's wrong, what can be improved than anyone else because they're spending 8 hours per day.*" (P3)

In addition to the value of individual employee experiences, the collective knowledge of a larger group greatly improves the process of idea generation. A process with broad participation generates more ideas and perspectives, thereby enhancing the innovation landscape, as participant 3 states, the more, the merrier. This broad involvement of employees fosters novel perspectives, which even employees with dedicated sustainability roles may overlook, consequently solidifying the outcome enhanced idea generation.

> "*the more the merrier, the lot of people thinking out the box when you roll is sustainability. You are used to your role and it's probably more difficult for you to think outside the box and to find some.*" (P3)

Participant 9 expands on this viewpoint, asserting that diverse perspectives can lead to a more comprehensive innovative solution. Such perspectives might unveil potential improvements that could otherwise be overlooked, thereby reinforcing Participant 3's statement.

> "*Then you get multiple perspectives, so your idea is ultimately further refined, which can result in a better idea.*" (P9)

Organisational culture

Cultural shift within the organisation As employees gain a greater awareness of sustainable options and modifying their thought processes to incorporate sustainability into their daily work activities, the organisation's culture will move towards sustainability.

> "*so initiative are a good, good way to to get the people to think like that.*" (P10)

In addition, employees evolve to adopt more sustainable practices, which improves their sustainability-focused outcomes. This shift in culture also promotes an environment conducive to knowledge sharing and raises awareness of the significance of sustainability, thereby supporting the alignment of the organisation's objectives with sustainable development. As Participant 1 emphasised that the culture in the organisation results in knowledge sharing.

> "*I think I can provide great support in this area with my knowledge in my field of expertise.*" (P1)

The shift in thought processes and practises towards sustainability, as highlighted by participant testimonials, is the result of EDGI, which creates a significant cultural shift within the organisation. This culture, in which sustainability is deeply ingrained, naturally encourages the development and exchange of innovative ideas that have a positive impact not only on the organisation's bottom line but also on the environment as a whole.

In addition, this cultural shift fosters an environment where knowledge sharing is encouraged, thereby reinforcing the organisation's dedication to sustainability, Participant 7 further elaborates on this topic, explaining how this openness to new ideas ultimately leads to enhanced sustainability

> "*the organisation is really open to employees to come up with our own ideas to reduce those kinds of costs and that's also driving you to become more sustainable*" (P7)

As employees feel more empowered and accountable, they are motivated to utilise their own expertise and ideas to drive sustainable practices. It's a virtuous cycle: the more information is disseminated, the more awareness is raised, which in turn promotes more sustainable practices.

Identifying with organisation The implementation of EDGI within organisations fosters a collective sense of objective among employees. Participant 9 highlights how EDGI is fostering individual purpose. This additional purpose serves as a motivational factor, as it entails a meaningful and forward-looking objective. Consequently, the outcomes of EDGI lie in the establishment of a purpose-driven environment.

> "*How are you part of your own organisation, but can you also be unique within that same organisation? So, do I feel at home, but at the same time, am I also unique? But why do we do that? It's because every unique individual brings different ideas, strengths, and insights that they can contribute to a group, creating a sense of synergy.*" (P9)

As EDGI initiatives often involve teamwork and collaboration as shown in the antecedents and as Participant 9 follows up with later during the interview, which can foster a strong sense of community. As employees work together to achieve common goals, they feel more connected to each other and to the organisation.

> "*Because that way, you immediately create a platform and establish a shared connection right here.*" (P9)

Participants 1 & 8 consistently state the same outcome of EDGI. The implementation of EDGI fosters a sense of alignment among employees towards the overarching goals and values of the organisation, particularly in cases where these goals encompass sustainability and the preservation of the environment. This alignment facilitates a stronger identification between employees and the organisation, thereby reinforcing their sense of belonging.

> "*So, as a result, you have more motivation to work for that company and you identify more with your company.*" (P1)

> "*A better relationship with the company and similar matters*" (P8)

Both the cultural shift within the organisation and the emergence of a unique organisational identity are integral to shaping the resultant organisational culture.

EDGI drives a cultural shift that is attributed to the increase in employee awareness of sustainable options. As EDGI also promotes knowledge sharing through collaboration, aligning employees with goals set by the organisation for sustainable development. As cultural norms encourage sustainability, creativity, and innovation, thereby altering the organisation's operations and employee interactions.

The shared purpose created by EDGI's employees contributes to the development of its distinctive corporate identity. It fosters a mission that extends beyond the pursuit of profit, as well as a sense of responsibility and affiliation. Employees feel a sense of community and belonging, which aligns them with the sustainability goals of the organisation and strengthens their identification with it.

Strategic Value

Following up on the rising customer demand, as discussed in section 4.2, the implementation of EDGI enables the attribution of consumer demand, thereby potentially resulting in a competitive advantage. Participant 6 suggests that capturing a larger market share can lead to a competitive advantage which in turn attracts investors.

> "*And if you can simply grab a slightly larger slice of the cake, increase your market share, then you have essentially taken away a larger portion from potentially less sustainable companies.*" (P6)

The increasing awareness and concern for sustainability and environmental issues among employees have led organisations to recognise the significance of how they profile themselves. EDGI could become a fundamental component in shaping the organisational culture and contributing to its overall sustainability image. Participant 5 highlights the growing importance of how companies are currently being portrayed for employees.

> "*I believe that in addition to conscious quitting, where people leave because they are not aligned with environmentally friendly practices, you also have conscious hiring, or whatever you want to call it, where individuals actively choose to work for more sustainable companies and prioritise the pursuit of environmentally friendly goals. So, I think it is crucial for an employer's attractiveness and appeal.*" (P5)

Furthermore, Participant 9 endorses Participant 5's observation that organisations utilising EDGI, resulting in improved CSR, are more likely to attract employees.

> "*That also implies attracting new talent, especially among the new generation, who place a strong emphasis on understanding what companies are actually doing and how they can contribute to a better society. They inquire about the company's mission and their role in it. This extends to both the product level and how committed the company is overall to making a positive impact.*" (P9)

The implementation of EDGI has a substantial influence on an organisation's financial growth, adherence to sustainability regulations, and strategic value. This is achieved through the attraction of a larger customer and investor base, as well as the enhancement of cost efficiencies. From a cultural perspective, the EDGI initiative facilitates a transition towards sustainability by fostering the exchange of knowledge, fostering the generation of ideas, and cultivating a collective sense of purpose among employees.

4.3.2. Employee outcomes

Next to organisational outcomes, EDGI also has several impacts on employees themselves which will be discussed in the following paragraphs.

Employee Development

As employees take part in green innovation initiatives such as idea generation contests or submit their ideas to their managers, gain insight from participating in the whole process.

> "*I think also to develop yourself, it's really nice to create ideas and I think you can learn from it also from my project that I mentioned to check if we can use different*" (P7)

In the company of participant one employees have to possibility to take part in certain training further developing themselves.

> "*Business units that win, for example, receive training from an external company*" (P1)

Participant 3 emphasises the possibility of employees acquiring knowledge from their rejected ideas by means of feedback. This observation serves to further support the two previously mentioned examples, which collectively involve a total of six interviewees expressing that the components of EDGI have the development of employees as an outcome.

> "*people can also learn from that, improve the initial idea, maybe, and come with a with a newer one that doesn't have the inconvenience of the first one.*" (P3)

Job Satisfaction

The findings showed that the ability to generate ideas and have them recognised as valuable contributed to a sense of fulfilment, as expressed by interviewees. This aligns with the principle of EDGI, which emphasises openness to ideas. Adding to this was the statement made by Participant 7 who really had a boost from generating and then seeing the idea being implemented.

> "*The benefits are that if it works out, then you really know that this was your idea and I think that gives you a boost.*" (P7)

Additionally, Participant 4 underscored the significance of being able to contribute to environmentally conscious initiatives as a factor contributing to job satisfaction.

> "*I think more job satisfaction if it's important for you if the environment is really important for you*" (P4)

Moreover, when posed with the questioning concerning potential outcomes of the EDGI, one notable finding was that approximately 33% of the interviewees expressed job satisfaction as their initial response, thereby reinforcing the significance of EDGI. Job satisfaction consequently, also influences the likelihood of employees leaving the company as Participant 9 stated.

> "*Ultimately, this is reflected in lower turnover rates, leading to a more stable workforce.*"(P9)

Furthermore, employee retention has multifaceted implications, one of which is the preservation of internal knowledge, as articulated by Participant 6.

> "*That something is a great idea, but it is not executed properly. It is actually executed by people who then leave, and it ends up being supported only by 1 or 2 individuals who eventually leave, causing the entire project to collapse. As a result, you lose a significant investment in innovation, including the financial and time investment, as well as all the knowledge and brainstorming that went into it.*" (P6)

Motivation

Based on the findings of Participants 1 & 8, it became apparent that when employees perceive that their contributions significantly impact the company's sustainable goals, their motivation to work intensifies.

> "*Feeling that you can make a greater impact with your own company provides you with more motivation to work for that company.*" (P1)

Participant 8, a manager, discusses the potential outcomes of using EDGI, referencing the time when his organisation began to incorporate more sustainable incentives and involve employees more comprehensively. He noticed an increase in motivation as a result.

> "*You can observe that it indeed has a positive impact on them, as they become more motivated to work.*" (P8)

4.3.3. Challenges

EDGI, like any other concept, is not exempt from encountering challenges. Despite organisations' occasional commitment to sustainability, the associated initiatives can be financially burdensome, resulting in a lower prioritisation of such efforts, as noted by Participant 1. Additionally including multiple employees in idea generation also has extra cost implications for the company.

> ”*So, even if you have ambitious goals to become environmentally friendly, if it becomes financially challenging, then every company tends to prioritise financial considerations over environmental ones.*” (P1)

> ” *So, it takes more time and ultimately more money as well.*” (P9)

In continuation of Participant 9’s statement, Participant 2 emphasised that when employees focus more on green idea generation, their workload will increase significantly, demonstrating that EDGI is time-consuming. Since 25% of the employees mentioned this as an important negative outcome, it should be considered.

> ”*What I have experienced in the past two years is that you see many things that can be improved, and you actively pursue and work on them alongside your regular tasks. This additional effort does require a significant amount of time.*” (P2)

The final challenge that became evident was underscored by five distinct interviewees, rendering it the most noteworthy challenge of this study. As employees invest significant effort in generating green ideas, it is evident that not all ideas progress to the next phase, resulting in employees becoming demotivated in sharing/working on green ideas. This underscores the significance of managerial support in such instances. However, it is worth noting that even with managerial support, employees can be demotivated when their ideas are rejected, as expressed by Participant 10.

> ”Somebody can propose a thing that was previously discussed and I think that all role is just to align expectations and explain properly, you know, with the rationale behind, but could it be demotivating. So that’s the challenge.” (P10)

5

Discussion and Conclusion

5.1. Discussion

This section delves into the findings of the preceding chapter 4. Discussing the three themes, Defining EDGI, Antecedents of EDGI and Outcomes of EDGI, all contribute to a comprehensive understanding of the concept EDGI. Furthermore, the three sub-research questions will be addressed, which will collectively contribute to answering the main research question.

The research problem highlights the lack of comprehensive research that combines GI and EDI, even with their growing importance. The available research, initiated by Buhl et al. (2016), remains mostly theoretical and lacks empirical validation. This gap in knowledge becomes critical considering rising government regulations and market demand, especially in the FMCG manufacturing industry, where there is a notable surge in demand for sustainable products, as reported by McKinsey & Company (2023). Therefore, the study aims to build upon the conceptualisation of EDGI provided by Buhl et al. (2016) by introducing empirical research, with the potential to offer substantial practical implications for FMCG manufacturers.

Firstly, the definition was examined by conducting research on how organisations presently approach this subject matter answering the first research question. The research findings have led to the identification of four distinct factors that define EDGI; ordinary employees, innovation as an outcome, green impact and voluntary participation. This definition is in line with the conceptualisation of Buhl et al. (2016) which definition of EDGI, when examined, results in ”ordinary employees”, ”voluntary engagement”, ”intentionally or unintentionally” and ”environmental improvements”. With this in mind, it can be asserted that the definition proposed by Buhl et al. (2016) is substantiated by empirical research, thus establishing more validity than before this research. It’s essential to highlight that while the results of the definition align with previous findings, this research goes beyond mere replication. Instead, it provides empirical evidence from interviewees who were not pre-informed about the definition of EDGI as proposed by Buhl et al. (2016).

Furthermore, one could argue whether ”Green impact” enhances the definitions of EDGI or if it’s merely an extension of EDI. Apart from the obvious implication that green innovation is different from regular innovation as reflected in section 2, the challenge in understanding this differentiation arises from the participant’s responses. Although the term ”green innovation” wasn’t consistently mentioned, when participants referred to innovation, they implicitly meant green innovation. This inclination can be linked to the interview structure, which emphasised green concepts from the start. Consequently, the centrality of the green impact in the definition of EDGI becomes evident. However, it’s crucial to acknowledge that the limited context provided during the interviews could be a restricting factor, potentially stemming from the interviewer’s skill set.

In addressing the second research question regarding potential antecedents, this study builds upon previous research which identified five antecedents: autonomy, leadership support, cooperation, innovation climate, and organisational support. While the findings of the current research confirm the

influence of these antecedents on EDGI, they also uncover additional antecedents which are shown in figure 5.1.

Upon examining the antecedents of the conceptualisation and the research findings, several similarities emerge among the factors. However, the selection and construction of these factors yield distinct aspects. Figure 5.1 illustrates the partial similarities between antecedents. Any such similarities will be further elaborated upon in the subsequent sections discussing the results. It's pivotal to remember, though, that this categorisation stems from the researcher's interpretation. The discussion will address each identified antecedent in ascending order, beginning with the antecedent that has the fewest associated codes."

The findings confirm autonomy, as found by Buhl et al. (2016), has a role in fostering EDGI, based on the reasoning that the term is the only found antecedent with exactly the same terminology and definition.

Network & community emerged as significant antecedents. This includes facilitating platforms that foster idea-sharing and cooperation among employees. Beyond this, these also promote knowledge sharing across various departments. Consequently, employees may gain new insights from other departments, potentially applicable within their own fields. This aligns with literature highlighting cooperation as a vital contributor to both GI and EDI. Thus, our results logically affirm the interconnected roles these concepts play.

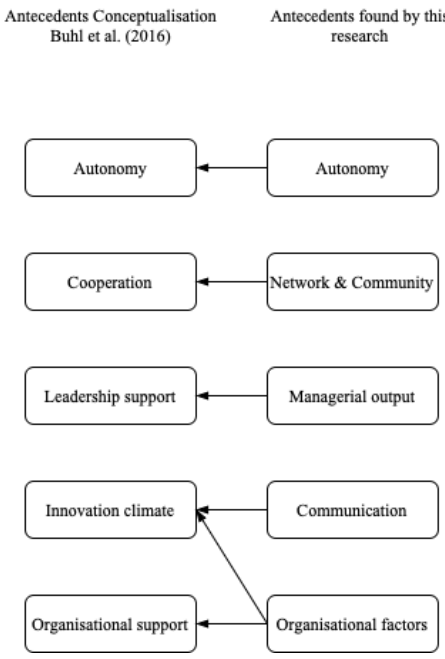

Figure 5.1: Similarities between antecedents

Furthermore, network & community confirms cooperation as an antecedent of EDGI (Buhl et al., 2016). This latter term can be seen as a broader factor than cooperation. It's important to underline their similarities, as both terms underscore the significance of social influences in promoting the sharing of ideas and knowledge. However, where network & community differentiates itself from cooperation is in its scope. While cooperation implies social interaction, network & community delves deeper, emphasising not just interaction but also its facilitation as mentioned before. While some might argue that cooperation inherently suggests the same, it could be counterargued that cooperation is too rudimentary a term to encompass this comprehensive meaning.

The following antecedent, communication, surprisingly wasn't highlighted in the existing literature as a significant antecedent, suggesting it may either be classified differently or gone unnoticed which is unlikely. As the interviews progressed, the role of communication as an antecedent became more evident. Essentially, effective communication pertains to the promotion of EDI across the entire organisation, advocating sustainability innovation, and implementing effective top-down communication strategies, the promotion of these initiatives not only fosters a sense of cohesive company morale but also serves as a reminder to employees of their capacity to engage in innovative practises. Coming back to communication not being mentioned by Buhl et al. (2016), it can be argued that innovation climate has similarities with communication as innovation climate talks about the organisational attitude towards green innovation which clearly includes communication.

The following three antecedents show small to no similarities with the antecedents found by Buhl et al. (2016). The fourth antecedent, employee empowerment, might technically fall under both managerial output and organisation categories. However, it stood out during the interviews due to frequent mentions, which underlines its significance. As such, it is treated as a standalone antecedent. This approach also underscores the centrality of the employee in EDI practices, reinforcing the importance of this factor. Stakeholder pressure is the fifth antecedent, already apparent as the research problem is also emphasised by not only regulatory bodies which was found important for GI (Chien et al., 2021) but

also the consumer which is pushing the organisations to become more innovative as non-sustainable organisations will lose demand (McKinsey & Company, 2023).

The sixth antecedent, motivation, which is made up of extrinsic and intrinsic elements, aligns with earlier EDI research, which emphasises the importance of intrinsic motivation for employees. While Buhl et al. (2016) emphasised the importance of a ”green identity” within EDGI, the evidence for such an identity emerged only subtly in some interviews. It can be argued that 'green identity' is part of intrinsic motivation however ascertaining the place of 'green identity' proved to be challenging due to the potential influence of the Hawthorne effect and the subjective nature of 'green identity'. Notably, this 'green identity' appears to play a more substantial role in the outcomes, a theme we will explore further.

Managerial output is a vital antecedent as already underscored by Buhl et al. (2016). It encompasses adaptability, idea management, manager's accessibility, leadership & motivational approach, and employee recognition. These facets were identified and support the antecedents found in the literature reviews in chapter 2. Buhl et al. (2016) focuses on supervisory support, aligning with the emphasis of Ramus (2002) on its significance. This supervisory or leadership support shares similarities with the concept of managerial output, particularly in aspects such as the acceptance of failures and the rewarding and recognition of employees. However, this research expands the term as it shines light on other elements such as managers' accessibility which also plays a crucial role. This accessibility emphasises that employees should be able to share their ideas regardless of the hierarchical structure. Chien et al., 2021 discuss barriers to GI, and managerial output ranks as the second largest factor in this research. Furthermore, Gupta and Barua (2018) highlight that lack of commitment and management's reluctance to transition to green practices can pose challenges. The findings of this research corroborate the importance of managerial output in EDGI as an antecedent and identify the key areas that could have practical implications.

The final antecedent, organisational factors, encompasses the aspects of employee development, employee participation and engagement, sustainability approach, organisational support and organisational culture. Organisational factors align with the conceptualisation proposed by Buhl et al. (2016), as it shows similarities with the antecedent organisational support and innovation climate, due to aspects such as employee development, and organisational support itself. Organisational support as defined by Buhl et al. (2016) does have differences as in this research the antecedent organisational factors, does not only consist of organisational support, which is also defined differently as it not only includes formal and informal rewards but adds resource availability, showcasing a crucial difference. Continuing with similarities of organisational factors, aspects such as organisational cultures show similarities with innovation climate. Liu et al. (2022) also underscore the importance of strategic and cultural factors, as well as resource allocation within the organisation. These aspects play a pivotal role in fostering a conducive environment for the initiation and fostering of EDGI.

While Buhl et al. (2016) offers foundational explanations of their conceptualised antecedents, these might appear basic, possibly due to a lack of empirical backing. In contrast, this discussion systematically compares each antecedent, highlighting both observed similarities and pertinent differences. The findings of the current study align with previous research. Thus, one can argue that this study contributes to the field of EDGI by grounding its insights in empirical evidence.

In concluding the second sub-research question, it is worth noting the frequency of codes per antecedent. The number of codes assigned to each antecedent reveals organisational factors as a predominant category. This raises the contention that it might be the most influential factor. Given that it relates to the organisation as a whole, it's plausible that it has the most assigned codes. However, it cannot be said that it is the most influential antecedent. Following this is managerial output, whose prominence in the data appears justifiable when looking at the number of codes assigned. However, the frequency of codes for the antecedents may differ more than anticipated, suggesting that some might fit better under a different antecedent. It's also crucial to consider that the prominence of these factors might be shaped by the sample design, the nature of the questions, or the interviewer's limitations. The distribution of codes across categories could be an area for future research, a topic we'll delve into later.

Answering the third sub-question, the focus is on the outcomes of EDGI. The findings indicate distinct outcomes, divided into organisational and employee outcomes. EDGI allows organisations to comply with customer demands, potentially leading to increased revenue. This is also an important factor for investors, one of the key antecedents. Typically, investors seek to maximise profit, which can create a conflict between profit and sustainability. This conflict may influence customer demand, as organisations that prioritise profit over sustainability may not align with customers' personal beliefs and values, leading to a decline in demand.

This focus on profit over sustainability doesn't only affect customer demand but also impacts employee retention. In today's context, employees are increasingly conscious about their workplace and the organisation's values. As found by interviews even though touched upon slightly personal values do really play a role in EDGI, as the researcher identified that people with a 'green identity' showed they really wanted to do something and tried to be as environmentally friendly as possible EDGI it's outcomes aid in complying with investors' expectations, meeting customer demands, and enhancing employee satisfaction. Moreover, it promotes employee development as employees will be part of this process which in itself is a learning curve, on top of this, the feedback received from managers when ideas are generated contributes to employee growth.

However, as with any concept, EDGI implementation presents obstacles. As previously mentioned, one of the significant factors to consider is the impact on cost and time. Idea generation and implementation will occur alongside individuals' regular jobs, which might not only require extra time but also impose additional costs. Moreover, the initial investments for GI are considerably high, making it a potentially expensive venture to undertake. Additionally, without proper management of idea generation by managers, it could demotivate employees highlighting the significance of efficient managerial output in fostering EDGI. Therefore, Organisations wanting to implement EDGI should keep in mind that if not managed properly the positive outcome motivation could turn into a negative outcome demotivation.

Table 5.1 summarises the discussion by providing a comprehensive overview of the findings. It details all categories from our analysis and, where required, delves into specific subcategories, offering a clear picture of our research results.

Theme	Categories	Specific categories
Defining EDGI	Voluntary Participation	
	Ordinary employee	
	Innovation as an outcome	
	Green impact	
Antecedents	Autonomy	
	Network & collaborations	Collaboration, Network empowerment
	Communication	Promoting EDI, Promoting sustainability, Top-down communication
	Employee empowerment	
	Stakeholder Pressure	Consumer demand, Investor demand, Regulatory bodies
	Motivation	Extrinsic, Intrinsic; Sense of ownership, Connection with the company, personal believes & values
	Managerial output	Manager's adaptability, idea management, Manager's accessibility, Leadership & motivational approach, Employee recognition, Managerial support
	Organisational factors	Employee development, Employee participation & engagement, Sustainability approach, Organisational support, Organisational culture
Outcomes	Organisational outcomes	Financial impact, Compliance, Enhanced idea generation and knowledge sharing, Organisational culture; Cultural shift, Identifying with organisation
	Employee outcomes	Employee development, Job satisfaction, Motivation
	Challenges	Time & Cost implications, Employee demotivation

Table 5.1: Results Research

5.2. Theoretical Implications

The findings support the conceptualisation proposed by Buhl et al. (2016) and also extend it. Firstly, the empirical research aligns with the definition proposed by Buhl et al., supporting it with empirical research, creating a more solid backed definition for future research. Buhl et al. (2016) emphasised the importance of cross-industry research and argued for the universal applicability of their conceptual theory. Despite the fact that this study is not cross-industry, it sheds light on how EDGI can be defined and implemented within the context of the FMCG industry. In this regard, these findings add to the research of Buhl et al. (2016), expanding the knowledge of EDGI in the industrial context of FMCG manufacturing.

With the identification of the additional antecedents, this study contributes to the theoretical conversation by providing a more nuanced understanding of the antecedents of EDGI, as it shows differences and similarities between the antecedents as shown in figure 5.1. This expands on the conceptualisation established by Buhl et al. (2016) and broadens our understanding of EDGI. Furthermore, the research also confirms the antecedents found by Buhl et al. (2016). Although Buhl et al. (2016) conceptualised the theory on EDGI, their discussion regarding its potential outcomes and challenges was limited. This research contributes to this part by presenting expected outcomes and difficulties identified by both managers and employees in the FMCG manufacturing industry, which has not been done before.

5.3. Practical Implications

In continuation of the previous section, there are consequential practical implications. By adding information, and therefore reinforcing the definition of EDGI specifically for the FMCG manufacturing sector, organisations can better grasp the concept and its significance, especially concerning environmental impact. This refined understanding provides a clearer distinction between EDI and EDGI. For organisations prioritising sustainability in their strategies, this enhanced clarity will aid in making informed decisions, potentially steering them more confidently towards EDGI.

As depicted in the chart 4.2 within the results section 4, the identified antecedents offer organisations a basis to assess the suitability of EDGI for their operational context. The frequency of codes further provides a hierarchy of which antecedents are most to least mentioned. Managers could harness the insights from this chart, in conjunction with the sub-factors of the antecedents displayed, to create a comprehensive roadmap specific to their organisation. Such a roadmap would highlight the essential elements present within their organisation to most effectively realise EDGI.

Furthermore, this research sheds light on the challenges associated with EDGI, including time and cost implications, showcasing that these should be taken into consideration. Additionally, if EDGI is not addressed appropriately, it can lead to potentially demotivating employees. By being aware of these issues in advance, organisations can take proactive measures to mitigate them before implementing EDGI.

5.4. Limitations

One limitation that should be acknowledged is the influence of social desirability among interviewees. The respondents might have offered responses that they perceived as socially desirable or anticipated, particularly in relation to sustainability, rather than their genuine opinions or experiences, potentially introducing bias to the findings. Despite efforts to reduce its occurrence, the phenomenon of the Hawthorne effect persisted, the cause of this occurrence could be related back to the limitation of the lack of skill of the interviewer or because potentially the nature of the topic as the topic EDGI, not the definition, was known beforehand.

Another limitation of the study is that the researcher did not specify which innovation phase EDGI occurred during. This resulted in situations where it was difficult to determine the best answer. Furthermore, the participants' understanding of the EDGI concept was limited. This limited comprehension made it difficult for them to respond to specific research questions. Therefore, the researcher was required to explain a number of questions, which could have introduced additional research bias. This reveals a further limitation: the interviewer's skills were somewhat limited, which may have affected the quality and dependability of the collected data as well as presenting the green innovative context of the interviews, Even though it was more than presented it did not convert as much as should be in the transcriptions.

The third limitation is the small sample size of this study. Although a well-thought sample design, the researcher had to revert to convenience sampling due to the low response rate of contact leads. This resulted in being able to only conduct twelve interviews, of which one HRM expert, four managers and seven employees instead of the 10 managers, 10 managers. Therefore our findings do not capture the full range of perspectives on EDGI. This small sample size also limits the generalisability of the research. Furthermore, all interviewees resided only in the Netherlands, which adds another layer of restriction to the applicability of our findings beyond this specific geographic context.

From a methodological standpoint, potential research bias emerged through the application of thematic analysis using a template approach. This is because it inherently relies on the researcher's interpretation of which quotes and codes fit into each category. Additionally, the research was conducted by a single researcher, which means there was no opportunity for the analysis to be cross-checked by another researcher.

5.5. Future Research

Firstly, future research should take into account the limitations of the study making sure that they are mitigated. Secondly, there are also some opportunities that arose from the research and findings.

As the antecedents were determined using a qualitative method, it would be interesting to see which of these antecedents is most prominent in fostering EDGI, future research could look into the antecedents and their correlation with EDGI. Next to doing quantitative research, based on the current definition and antecedents found in this research it would be interesting to see a framework for organisations that want to expand their employee-driven green innovation practises, this framework could also include a clear road map serving as a baseline for companies.

It would also be of great essence to focus on which order of EDI(First, second or third) is best suited for fostering EDGI, although quite specific, second-order EDGI was mentioned a couple of times during the interviews which could make it an interesting case to do further research on. As indicated by Buhl et al. (2016), the green identity of employees, including their personal beliefs and values, could play a significant role in EDGI. While these factors were referenced by interviewees in the present study and somewhat addressed, a more rigorous examination could yield insightful findings regarding their effects on EDGI. Thus, future research could focus more extensively on exploring the influence of employees' green identity, values and beliefs on the effectiveness and prevalence of EDGI.

Finally, future research could try to reproduce this research in the FMCG Manufacturing industry as EDGI is still in its infancy, with for example a larger sample or by doing a case study, to validate and further expand the results.

5.6. Conclusion

Upon thorough examination of the findings and addressing the four subsidiary inquiries, the main research question can be adequately answered.

> *How can organisations in the Fast Moving Consumer goods manufacturing industry effectively engage in employee-driven green innovation?*

Organisations could effectively engage in EDGI if they would have a clear definition and understanding of the concept and its outcomes. This research accomplishes to come up with these through conducting qualitative research on employees and managers living in the Netherlands and working in the FMCG manufacturing industry.

Bridging the gap between the understanding required and its realisation, this research adds understanding to the three themes that could be of the essence for an organisation to effectively engage in EDGI, which are:

1. Definition of EDGI
2. Antecedents of EDGI
3. Outcomes of EDGI

The first of these themes helps organisations understand what EDGI entails, which is the first step in fostering EDGI, it is defined by the following categories: voluntary participation, includes all employees throughout the organisation and has an innovative outcome *with* a green impact. Having a clear understanding gives organisations a clear baseline to start from.

Understanding the antecedent of EDGI is of high value as such understanding allows organisations to strategically prioritise the implementation of these antecedents, taking into consideration their feasibility within the organisational context. Furthermore, a comprehensive understanding of these antecedents facilitates an assessment of the relative ease or complexity associated with their implementation within the organisational environment, resulting in added weight to effectively implementing EDGI.

Effectively implementing EDGI yields outcomes, which include both benefits and challenges. The potential benefits of EDGI can be divided into organisational outcomes such as financial gains, compliance with regulatory bodies, satisfaction of investor and consumer expectations, and employee outcomes such as enhancement of employee job satisfaction which can lead to increased employee retention and employees being more motivated overall. However, it is equally important to understand the potential challenges. Incorrect implementation of EDGI can demotivate employees. Moreover, the time required to generate and implement these green innovative ideas can overburden employees, especially when added to their regular workload. Lastly, due to the high costs typically associated with sustainable innovations, organisations often prioritise other, less expensive innovations.

Understanding these expected outcomes can help not only persuade an organisation of the importance of EDGI but also aid in decision-making regarding implementation, helping organisations understand why they want to engage in EDGI.

In sum, an additional understanding of the definition, antecedents and outcomes has been gathered through empirical research, adding to the conceptualisation of EDGI. This forms the basis on which organisations can create a roadmap for their specific organisations to effectively engage in EDGI.

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A

Interview Protocol

A.1. Interview Questions

Managers in FMCG 1 Defining Employee driven green innovation

Introductory question What is your current role in company X and could describe your day-to-day activities?

1. How would you describe your organisation's approach to sustainability and environmental responsibility? **– Green innovation**

2. Does your organisation engage and empower you to come up with innovative ideas themselves? And how are they doing this? **– Employee driven innovation**

3. How would you describe innovation initiatives empowered by employees within your organisation? Why? **– Employee driven innovation**

(Back up) How important do you think it is for organisations to consider environmental and sustainability factors when developing new products, services, or processes? **– Green innovation**

(Back up) How important do you think it is for organisations to consider involving employees in developing new environmental and sustainable products, services, or processes? **– Employee Driven Green Innovation**

4. How do you understand the term Employee-Driven green innovation?

- How would you describe employee-driven green innovation within your company or in the industry FMCG or CPG? – **Employee driven green innovation**
  - Why?
  - Do you think there is space in companies for it?

5. In what ways do employees contribute to the development and implementation of sustainable practices or environmentally friendly products or processes in your organisation? **– Contribution employees EDGI**

6. How do you support and encourage green innovation?

- How does your organisation support and encourage green innovation? Are there any mechanisms in place for employees to share their ideas or suggestions related to sustainability and environmental improvements? **– Support & Encourage EDGI**
- If not, what would motivate you to take part in these initiatives?

7. In your experience, what motivates your team members to take the initiative and engage in sustainability-focused projects or come up with innovative solutions themselves to environmental challenges? **- Participation in EDGI**

8. What factors do you think are needed for employees to come up with green innovation initiatives themselves? **– Factors, participation in EDGI**

- Why?

9. Can you share examples of ideas that were suggested by a team member and have contributed to your organisation's sustainability efforts or led to the development of environmentally friendly products, services or processes?

- If an employee comes up with such an idea, what are the next steps in such a process?

10. Can you discuss any examples of employees' personal values or beliefs influencing their involvement in green innovation initiatives within your team? "Think of being pro environmental and their willingness to put in more work"

2.1 Back up questions Antecedents EDGI

(Back up) Do you think employees should be included in the green innovation process?

- Why?

- Do you think as a manager you have a good overview on everything, but the finer details can be submitted by the employees as they have a more in-depth view on their specific task? **- Tacit Knowledge**

(Back up) Are employees given extra time next to their job to develop themselves with an eye on sustainable practises?

(Back up) How do employees within your organisation collaborate and communicate to address sustainability challenges or opportunities, and how does the organisation support these collaborative efforts? **– Communication & Collaboration EDGI**

(Back up) How do employees in your organisation identify and prioritise sustainability issues that need to be addressed? **– Employee identity**

(Back up) How does your organisation support employees in balancing their regular job responsibilities with their involvement in green innovation initiatives? **– Work balance / autonomy**

(Back up) Are there any employee networks or communities within your organisation that focus on promoting sustainability and sharing best practices related to green innovation? **– Networks EDGI**

3 Potential outcomes of Employee Driven Green Innovation

11. What do you think outcomes can be of including employees into idea generation/the whole innovative of sustainable practices?

- Why?

12. How would employee involvement in innovation help you or your team?

13. How do you envision the future of sustainable practises within your organisation, with a greater emphasis on employee participation in the green innovation process?

Employees in FMCG

1 Defining Employee driven green innovation

Introductory question What is your current role in company X and could describe your day-to-day activities?

1. How would you describe your organisation's approach to sustainability and environmental responsibility? **– Green innovation**

2. Does your organisation engage and empower you to come up with innovative ideas themselves? And how are they doing this? **– Employee driven innovation**

3. How would you describe innovation initiatives empowered by employees within your organisation? Why? **– Employee driven innovation**

(Back up) How important do you think it is for organisations to consider environmental and sustainability factors when developing new products, services, or processes? **– Green innovation**

(Back up) How important do you think it is for organisations to consider involving employees in developing new environmental and sustainable products, services, or processes? **– Employee Driven Green Innovation**

4. How do you understand the term Employee-Driven green innovation?

- How would you describe employee-driven green innovation within your company or in the industry FMCG or CPG? – **Employee driven green innovation**
  - Why?
  - Do you think there is space in companies for it?

2 Antecedents of Employee Driven Green Innovation

5. In what ways are you able to contribute to the development and implementation of sustainable practices or environmentally friendly products or processes in your organisation? – Contribution employee EDGI

6. How does your organisation support and encourage you to come up with idea for green improvements of Products and processes?

- Are there any mechanisms in place for where you can share your ideas or suggestions related to sustainability and environmental improvements? **– Support & Encourage EDGI**

7. In your experience, what motivates you and/or other team members to take the initiative and engage in innovative solutions yourself to environmental challenges? **- Participation in EDGI**

8. What factors do you think are needed for you or your teammates to come up with improvements initiatives in sustainability and environmental improvements? **– Factors, participation in EDGI**

- Why?

9. Can you share examples of ideas that you or a team member suggested and have contributed to your organisation's sustainability efforts or led to the development of environmentally friendly products, services or processes?

- If an employee comes up with such an idea, what are the next steps in such a process?
- What happens when you come up with an idea for a sustainable or environmental improvement in product or process, could you explain the process?

10. Can you discuss any examples of your' personal values or beliefs influencing your involvement in green innovation initiatives?

2.1 Back up questions Antecedents EDGI

(Back up) Do you think you should be included in the green innovation process?

- Why?
- Do you think as employee you know more in-depth knowledge on their specific tasks related to your job than your manager and do you think it could be beneficial for your manager to include you in the process because of this reason? **- Tacit Knowledge**

(Back up) Are you given extra time next to your job to develop yourself with an eye on sustainable practises?

(Back up) How do you collaborate and communicate within your organisation to address sustainability challenges or opportunities, and how does the organisation support these collaborative efforts? **– Communication & Collaboration EDGI**

(Back up) How do you identify and prioritise sustainability issues in your organisation that need to be addressed? **– Employee identity**

(Back up) How does your organisation support you in balancing your regular job responsibilities with your involvement in green innovation initiatives? **– Work balance / autonomy**

(Back up) Are there any networks or communities within your organisation that focus on promoting sustainability and sharing best practices related to green innovation where you can participate in? **– Networks EDGI**

3 Potential outcomes of Employee Driven Green Innovation

11. What do you think outcomes can be of being included in the idea generation/the whole innovation of sustainable practices? Why?

12. How would involvement in innovation help you or your team?

13. In what ways do you think the freedom of being able to innovate and being taken seriously would help you and the company?

A.1.1. Informed consent

You are being invited to participate in a research study titled MSc Thesis Employee-driven green innovation. This study is being done by corresponding research Ritchie Damen of Delft University of Technology.

The purpose of this research study is to contribute the knowledge of Employee driven innovation by looking into the antecedents of employee driven green innovation, and what the current view and status this concept is and will take you approximately *15-40* minutes to complete. The data will be used for the MSc Thesis

We will be asking you to on the antecedents of Employee Driven Green Innovation within your company, your own viewpoints on topics such as employee driven innovation, green innovation and what the potentials of Employee Driven Green Innovation.
As with any online activity the risk of a breach is always possible. To the best of our ability your answers in this study will remain confidential. For the purpose of this interview, we will collect name, email-address, job description and domain of activity. We will minimize any risks by anonymising all gathered data of the interview so that you do not have to worry about any data leaking. After the interviews have been done the recording will be transcribed, and then summarized and the recording itself will be deleted so that only the anonymised data (the summary) will be left. The recording of the data before transcribing will be temporarily stored on the TU Delft institutional drive.

I understand that taking part in the study involves the following risks: Accidentally revealing identity of the interviewees, Privacy violation, Data Breaches & Reputational damage. I understand that these will be mitigated By storing all information in TUD approved storage solutions and limited access rights to the data. The data will only be accessible by the research team of TUD.

Your participation in this study is entirely voluntary and you can withdraw at any time. You are free to omit any question.

After your interview the anonymous summary will be sent to you in the form of a summary via email, this is the summary that will be end up in the appendix of the thesis which will be publicly available Should you have any concerns regarding the content of the summary, you are welcome to voice any concerns before publication (expected around 15th of August).

You consent to the aforementioned statements by replying to this email with words similar to "yes, I agree" or by signing this document in the box below.

Corresponding Researcher

R.F. Damen
R.F.Damen@student.tudelft.nl

Responsible Researcher

Dr. N. Pachos-Fokialis
N.Pachos-Fokialis@tudelft.nl

Signature

_____	_____	_____
Name of participant [printed]	Signature	Date

Figure A.1: Informed consent