TU Delft

Master Thesis Report

FLUOR

Towards Proactive Integration of Sustainability in Projects

A framework for integrating sustainability at the operational level of EPC contracting organization

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MSc. Construction Management and Engineering

DELFT UNIVERSITY OF TECHNOLOGY

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A framework for integrating sustainability at the operational level of EPC contracting organization

In partial fulfilment of the requirements for the degree of **Master of Science** in

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In collaboration with **Fluor B.V**

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PREFACE

This thesis concludes my journey at TU Delft as a master's student in Construction Management and Engineering. The past two years at TU Delft have been full of learning, with lessons learned that go beyond the educational limits. The past year of my life has been a roller-coaster ride that has allowed me to pursue my passion while also teaching me significant life lessons. I was able to overcome all of the challenges and accomplish my end goal. This challenging journey of two years has positively affected me both personally and professionally.

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EXECUTIVE SUMMARY

In recent years, the concept of sustainability has grown in popularity and has become a critical strategic component for businesses (Garza, 2013). It is no longer debatable whether organizations should examine the effects of their operations on society and the environment (Epstein & Buhovac, 2014). Corporate organizations, as the industry's productive drivers, play a crucial role in attaining sustainable development. Thus, the problems have shifted from "WHY" to "HOW" to integrate sustainability into management decisions at all organizational levels (Epstein & Buhovac, 2014). Corporate entities, such as EPC contractors, tend to realize their strategic goals and produce value for their shareholders through projects. Projects are viewed as a change driver that allows organizations to lower their impacts while also contributing to the long-term development of the company and society. However, for sustainability to be evident in all organizational practices, these methods must be operationally well adapted. Organizations are increasingly struggling to translate their strategic goals into project-specific activities (Marcelino-Sádaba et al., 2015; Engert & Baumgartner, 2015). In practice, there is a significant gap between strategy formulation and project implementation (Økland, 2015). Organizations such as contractors, according to Garies et al. (2013), are more proactive at the strategic level, whereas operational decision making is characterized by unstructured and reactive behavior. It has become critical for EPC contractors in the process industry to think about sustainable project execution and reducing the impact of their operations on society and the environment. As a result, the research answers the following problem statement:

EPC companies are not particularly pro-active in terms of integrating sustainability at the operational level, nor are they able to completely implement their defined strategic objectives on projects. The integration of sustainability strategies in projects is affected by the gap between strategic and operational levels.

The primary goal of this research is to bridge the gap between strategic sustainability goals and its implementation at the operational level. To achieve this a framework is developed for the EPC company to enhance the operational integration of sustainability and bridge the implementation gap. The following steps aid in achieving the research goal: To begin, understanding the notion of sustainability and investigating the elements required for the implementation of sustainability strategies. Second, understanding the distinction between strategic and operational levels, as well as investigating the barriers to sustainability implementation. Finally, building a framework and making recommendations to overcome barriers to enhance sustainability integration at operational level. Considering the research objective, the following research question is proposed:

How can EPC contractors operating in the process industry pro-actively integrate strategic sustainability objectives into the operational level of their organization?

The study used a qualitative methodology to answer the main question. The research is divided into three phases. The first phase includes a thorough assessment of the literature and documents. The notion of sustainability in general and in the context of corporate organizations was investigated using a literature review. The examination of literature also indicated important elements that an organization must consider while implementing sustainability strategies. Then, these sustainability elements are further operationalized in practice to assess its application within the EPC company. Through document review the sustainability aspects of the EPC company were studied both at the strategic and operational level. A comparison was made between the strategic and operational level with respect to the sustainability elements. Following the

analysis of the documents, a set of indicators were developed to operationalize each element and guide the semi-structured interviews. The second phase of the study includes data gathering via semi-structured interviews and thematic analysis using Atlas.ti software tool. The purpose of the semi-structured interviews was to analyze the data collected for each element and to highlight the barriers to implementing sustainability. It helps in reflecting the consideration of elements in practice from the perspective of practitioners. The interviews also helped identify the barriers to sustainability implementation; a total of 20 barriers were identified. These barriers are a mix of internal and external barriers that create a gap between the strategic and operational levels. The third phase synthesized the findings of the previous two phases and proposed recommendations to the EPC company to mitigate barriers, enhance sustainable integration, and bridge the implementation gap.

The barriers identified through the interviews are prioritized based on their likelihood of occurrence and impact on the operational integration of sustainability. Prioritizing the barriers is critical so that the EPC company understands which barriers have the greatest impact on sustainability implementation and lead to implementation gaps, and how to eliminate those. This prioritizing of the barriers will also serve in assessing their impact on project sustainability implementation and how these impacts may be mitigated. The proposed mitigating actions will assist the EPC company in overcoming the barriers and stimulating an atmosphere that prioritizes sustainability. The mitigating steps will aid in overcoming human-related barriers that impede the organization's growth toward sustainability.

The proposed framework enhances the operational integration of sustainability and connects the strategic and operational levels to bridge the gap (figure 1). The framework consists of four different phases, all of which contribute to the long-term sustainable development of the company and society. The four phases are strategy, project planning, project operations, and outcome. The strategy includes the strategic level vision and goals, followed by project planning, which includes the consideration of sustainability elements required for implementing sustainability strategies, the plans, guidelines, programs, and structure within the company, as well as the barriers and mitigation measures. Organizational decision-making, lifecycle thinking, balancing triple bottom line principles, stakeholder engagement, and a proactive approach are the five sustainability elements. This stage is employed during the proposal phase since early decisions potentially affect the entire project lifecycle. The project planning phase of the framework will aid in the establishment of strategies and methods for evaluating both social and environmental performance, as well as trade-offs that must be made when there are implementation barriers. Then the project operations phase follows, which includes the establishment of sustainability actions and key performance indicators (KPIs) to measure performance. This phase is essential since it is when the strategy is put into action. The actions include a combination of standardized and project specific actions. It is vital to translate actions into measures or key performance indicators (KPIs) that may be used to assess sustainability performance. The scorecard will help to assess the efficacy of such actions as well as the potential payoffs of sustainability actions on projects. This results in the evaluation of the outcomes and the formulation of a business case for long-term viability. The results will aid in assessing the impact of actions on the social, economic, and environmental dimensions of sustainability.

The framework can be put into action by focusing on generating key performance indicators. This framework component is regarded as the most critical for practical implementation. Leading and lagging indicators can be used to forecast the project's sustainability trajectory. The use of defined actions in project status review meetings can also aid in normalizing the framework and generating a consistent reporting template. Furthermore, the implementation would be incomplete if the lessons learned were not documented. This will aid in changing people's mindsets as tangible result can be seen with use of this framework. This will

also help in facilitating discussions on how to consistently improve performance and develop strategies. However, it is critical that management supports this as a change-driver and influences organizations' sustainability focus.

Using the suggested framework to make the strategy explicit has the following benefits: it encourages communication and strategy execution, allows for strategy discussion within the organization, and tracks progress toward long-term goals to determine whether the strategy is clear or needs improvement.

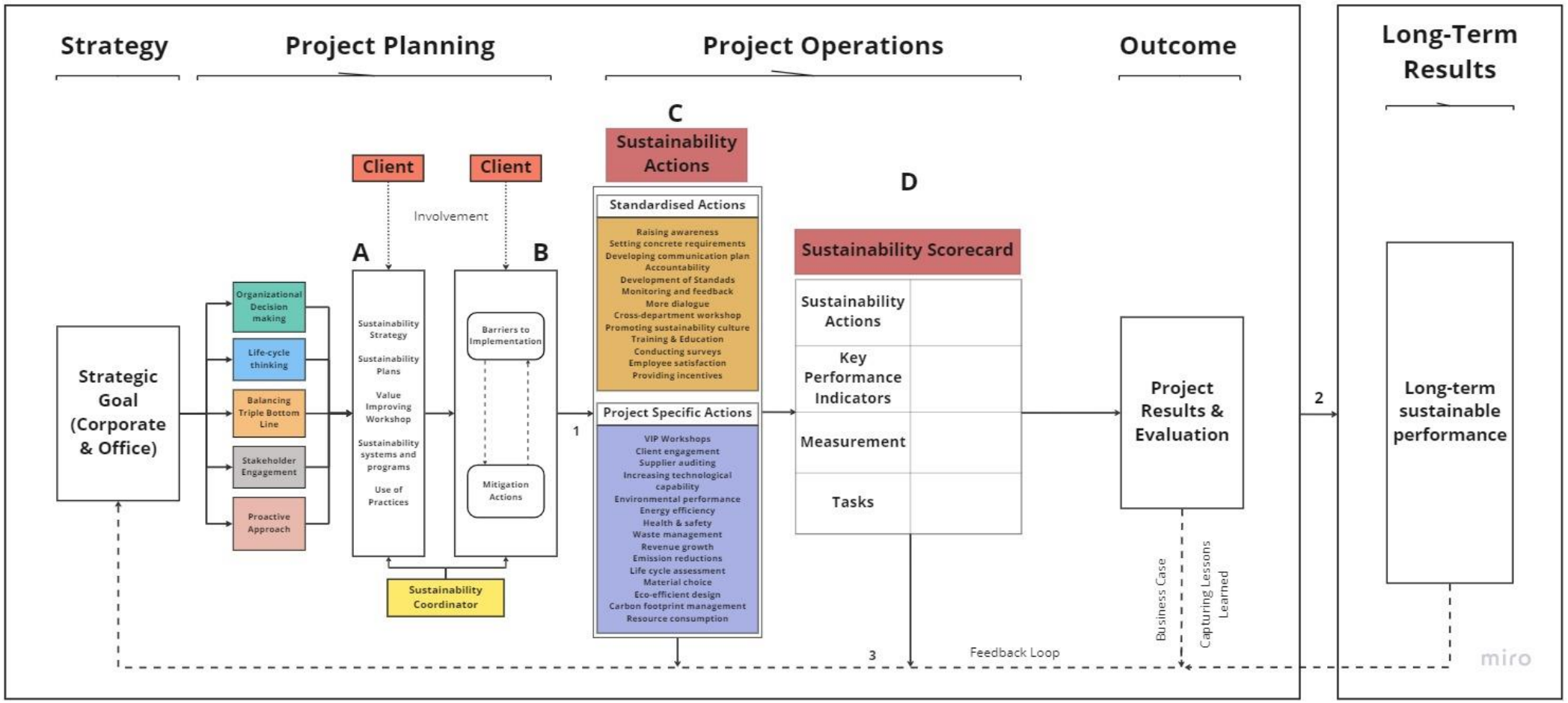

Figure 1: Sustainability Integration Framework

Recommendations for future research and practice

The next step in future research could be to conduct quantitative research on the suggested framework by defining KPIs and a suitable measurement system. Identifying the relevant KPIs will aid in understanding the consequences of the actions and which KPIs should be prioritized to mitigate those consequences. The research can concentrate on creating a project checklist. Future studies could also look into the role of humans in the implementation of sustainability. This can be accomplished by researching the operational knowledge and competencies required of a project manager. An exploratory study can also be conducted to better understand the financial benefits of implementing sustainability and how sustainability can result in cost savings.

Recommendations were also made for the EPC company. Despite the fact that the EPC company is not the project owner, it is vital that it embraces the concept of sustainability at the operational level and is proactive in engaging clients to enhance sustainability implementation. It is critical to remember that developing a sustainable culture inside an organization takes time and requires the collaboration of all employees, not just management. It is critical to strike the proper balance between top-down and bottom-up approaches. Increasing awareness through education and training, developing a reporting system, including sustainability as a standard in client proposals, creating a formal position of sustainability coordinator on all projects, and making sustainability a central topic within the organization rather than a window dressing criteria are also among the recommendations.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS

CSF	Critical Success Factors
EPC	Engineering, Procurement, Construction
FEED	Front End Engineering and Design
GHG	Green House Gases
GRI	Global Reporting Initiative
IPIECA	International Petroleum Industry Environmental Conservation Association
ISI	Institute for Sustainable Infrastructure
ISO	International Standards Organization
KPI	Key Performance Indicators
KRA	Key Result Areas
MRQ	Main Research Question
NAP	Process Industry Network
OSR	Operating System Requirements
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PMO	Project Management Office
SDG	Sustainable Development Goals
SRQ	Sub-Research Question
TBL	Triple Bottom Line
TRIPLE Ps	People, Planet, Profit
UN	United Nations
USGBC	U.S Green Building Council

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CHAPTER 1: RESEARCH INTRODUCTION

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CHAPTER 1: RESEARCH INTRODUCTION

This chapter presents the study background (1.1), the case company (1.2), the problem statement (1.3), the research design (1.4), the research relevance (1.5), the research strategy (1.6), and the thesis outline (1.7).

1.1 Background

Sustainability is regarded as one of the most prominent issues confronting the world today. As a response to the world's environmental crises and severe socioeconomic inequalities, sustainable development is becoming the primary paradigm of development for organizations and governments (Silvius, 2017; Waas et al., 2014). The issue of sustainability can no longer be ignored. With the implementation of national and global targets such as the Paris Agreement and the Circular Dutch Economy by 2050 (Paris Agreement, n.d.; Ministerie van Infrastructuur en Waterstaat, 2021), it is critical to integrate sustainability into organizational strategies and values. Corporate organizations, as the industry's productive drivers, play a crucial role in attaining sustainable development (Hahn et al., 2015). Sustainability is thought to be critical for organizational resilience and long-term corporate performance (Goel et al., 2019). According to Kivila, Martinsuo, and Vuorinen (2017), this knowledge and the need for procedures to be aligned with sustainable principles is also reaching operational levels. As a result, the emphasis has shifted from understanding WHY sustainability implementation is vital to determining HOW sustainability may be integrated into organizational processes and systems (Kivila et al., 2017; Sabini et al., 2019; Silvius & Schipper, 2014). Projects are viewed as the present vehicle for change in shaping the future, and they are regarded as crucial in contributing to the long-term growth of organizations and society (Garies et al., 2013; Silvius, 2017; Marcelino-Sádaba et al., 2015; Silvius et al., 2017). Corporate organizations seek to fulfill their organizational strategic goals through projects, providing value for their shareholders and clients. Furthermore, it gives them the ability to affect change in the sector and achieve a long-term competitive edge (Silvius et al., 2012). However, converting high-level strategic sustainability goals into specific project actions remains extremely difficult for corporate organizations, particularly contractors (Marcelino-Sádaba et al., 2015; Engert & Baumgartner, 2015).

1.2 Case Company- Fluor

Fluor corporation is an American global engineering and construction company headquartered in Irving, Texas. It is the largest publicly traded engineering & construction company with over 41,000 employees delivering services in three client markets: Energy solutions, Urban solutions, and Mission solutions. Fluor delivers professional and technical solutions to clients worldwide in order to produce safe, well-executed, capital-efficient engineering, procurement, and construction (EPC) projects. In a nutshell, engineering, design, procurement, and construction of big industrial facilities and plants. Fluor's clientele include companies that are leaders in chemicals, advanced technologies, infrastructure, mining, metals and fertilizers, life sciences, and government agencies. Because these projects need a significant commitment in capital, resources, and time, they are realized through an EPC contract. An EPC contract is a type of construction contract in which the contractor is required to deliver a full facility at a predetermined price (lump-sum) to the client, who simply needs to "turn a key" to begin using the facility. An EPC contractor is typically in charge of practically every stage of the project, including feasibility, predesign, and FEED. Fluor B.V. (Fluor Netherlands) has been offering well-executed and capital-efficient EPC projects throughout Europe and the Middle East for over 55 years. Fluor shall be referred to as an EPC company or EPC contractor throughout this study. The business strategy is defined along four core values, which are Safety (we care for each other), Integrity (we do what is right), Teamwork (we work better together), and Excellence (we deliver solutions).

Fluor has made an attempt towards sustainable development, formulating strategic goals, sustainability plans, and initiatives at the corporate level. Fluor's sustainability mission envisions meeting the needs of clients while conducting business in a socially, economically, and environmentally responsible manner to the benefit of current and future generations, thereby creating value for all stakeholders.

Fluor's sustainability actions support the United Nations (UN) Sustainable Development Goals (SDGs). In 2020, Fluor's Sustainability Committee aligned the Sustainability Policy with the 17 UN SDGs to help achieve a more sustainable future for all. Fluor's sustainability focus based on the policy aligns primarily with four UN SDGs: 7, 8, 12, and 13, and secondarily with six other SDGs: 3, 9, 10, 15, and 16.

Figure 1-1: Fluor's sustainability focus based on UN SDGs (retrieved from: Fluor 2021)

Fluor has made numerous efforts toward conducting business in a more sustainable manner, including the development of a carbon footprint monitoring system, screening tools, guidelines, and a performance indicator tracking system. These tools assist them in identifying the most important sustainability actions, monitoring project sustainability performance, and identifying sustainability emphasis areas. However, these tactics and techniques will only be effective if they reach all levels of the organization and are properly understood by the people. This implementation process is still in its early stages. It is vital to focus more on the operational level by incorporating more sustainability scope into projects and raising internal awareness for project managers to demonstrate greater commitment and support for sustainability. As a result, Fluor offers a fantastic opportunity to investigate the necessary factors for integration of sustainability into projects.

1.3 Problem Statement

Corporate organizations, as the productive driver, are critical to sustainable development (Hahn et al., 2015). Furthermore, as a driving force behind continued industrialization, they hold the primary responsibility for ensuring sustainable development. A successful attempt to incorporate sustainable objectives in projects would be to translate high-level strategic sustainability goals into tangible sustainability actions at the operational level in projects, thereby increasing the company's sustainable performance.

On a strategic level, corporate organizations such as contractors increasingly demonstrate proactive engagement with sustainability (Garies et al., 2013). However, for sustainability to be adapted in all organizational practices, these methods must be adapted at the operational level. In practice, there is a significant gap between strategy formulation and its implementation at operational level (Økland, 2015). There is a missing link between the strategy formulation and implementation, thereby hampering the integration of sustainability in projects. As more organizations elevate sustainability to a strategic priority, the challenges associated with the execution of these activities have escalated (Sroufe, 2017). The importance of formulating sustainability strategies has already been widely recognized by managers. However, translating the concept into action i.e., into concrete initiatives, remains highly challenging (Engert & Baumgartner, 2016). According to researchers, integrated ways to putting sustainability into action are inadequate, and there is no systematic approach to effectively incorporating sustainability into projects (Silvius et al., 2012; Sabini et al., 2019; Epstein & Buhovac, 2014). As a result, sustainability goals often remain confined at the strategic level.

Companies in the energy solutions market often execute front end engineering and design (FEED) and/or engineering, procurement, and construction (EPC) projects in areas such as chemicals, production, fuel, liquefied natural gas, nuclear project services, and various industrial facilities. Because of their high consumption of raw materials and energy, as well as their significant environmental impact, these projects are crucial in the shift to more sustainable practices (Pajunen et al., 2015). In practice, translating strategic objectives into project specific actions is a challenging process (Marcelino-Sádaba et al., 2015). The gap between the strategic level objectives and their implementation at the operational level is also observed during the discussions involving the case company, Fluor. One of the most challenging issues the company confronts when seeking to integrate sustainable objectives into projects is translating high-level sustainability goals into tangible measures that can be used in projects. Furthermore, apart from clients willingness to pay or the assigned project manager it is unknown what influences the integration of sustainability at the operational level.

Integrating sustainability into projects requires that organizations proactively identify and address the barriers to adoption (Fathalizadeh et al., 2021). When it comes to incorporating sustainability into these projects, the EPC company works with clients in a reactive rather than proactive manner. There are a few clients that are concerned with sustainability, whereas the majority are concerned with traditional constraints like cost and time, emphasizing short-term achievements over long-term success. The emphasis on short-term profit is contrary to the notion of sustainability (Pajunen et al., 2015). In essence, what is lacking is a strong focus and demand for sustainability.

Hence, to successfully integrate sustainability at the operational level the factors to bridge the implementation gap must be identified and integrated into a practical approach. As a result, sustainability may be fully integrated at the operational level and thus become essential for competing and maximizing profits.

The following problem statement can be derived from the above-mentioned problem description:

"EPC companies are not particularly pro-active in terms of integrating sustainability at the operational level, nor are they able to completely implement their defined strategic objectives on projects. The integration of sustainability strategies in projects is affected by the gap between strategic and operational levels."

1.4 Research Design

This section presents the research design. Firstly, the research gap (1.4.1) is presented followed by defining the research objective (1.4.2). Then the research questions (1.4.3) and the research scope (1.4.4) are presented.

1.4.1 Research Gap

Acknowledging sustainability is critical in engineering and construction projects because deliverables and processes may have a significant environmental, social, and economic impact. It has now become significant for organizations to also assess the sustainability of the project delivery process (Kivila et al., 2017). When it comes to construction projects, sustainability integration is heavily reliant on the client's willingness to pay, which is a trigger to sustainability integration (Peenstra & Silvius, 2018). One of the causes for unwillingness to pay for sustainability is a lack of understanding of how to consider sustainability (Peenstra & Silvius, 2018). A significant amount of research is focusing on the integration of sustainability in infrastructure projects such as tunnels (Gijzel et al., 2019), transmission system operators projects (Athanasiou, 2021), and urban development projects (Van Es, 2018). However, research on the integration of sustainability in process industry projects is limited. This also limits the contractor's capacity to engage the clients to realize projects in a sustainable manner. As a result, contractors are unable to implement their sustainability strategies at the operational level. Furthermore, literature on the implementation of corporate sustainability strategies is still scarce and there is a growing demand from scholars for more empirical research (Engert & Baumgartner, 2016; Klettner et al., 2014).

To date, there has been limited research on the perspective of contractors, with studies focused exclusively on marine contractors (Schuylenburg, 2019) or utility infrastructure contractors (Molenaar, 2021). The question of incorporating sustainability into process sector projects from the standpoint of an EPC contractor has received less attention. Given the nature of the construction industry, where clients are more concerned with traditional constraints such as cost, quality, and schedule, less emphasis has been directed to integrating sustainability objectives into projects. Contractors must measure and reduce the environmental impact of their operations by implementing sustainable approaches. As the integration of sustainability is not yet fully understood, it is impossible to evaluate and communicate its benefits to the client. In the context of process industry, research from EPC contractors' perspective and how the factors influence the integration of sustainability in projects, is yet to be explored.

1.4.2 Research Objective

A research objective must be developed in order to approach the research problem and address the research gap. The purpose of this research is to advise EPC contractors on how they can be proactive themselves, as well as in making their clients aware of the choices that they can have for integrating sustainability into projects. The research provide solutions to the EPC contractor to overcome the barriers to enhance the integration of sustainability in projects and bridge the implementation gap. The results will provide a structured approach in connecting high-level sustainability objectives to more concrete and tangible solutions for the project. It is important for the company to understand how the resulting solutions from this research be applied to all projects. In the future, the EPC company wants to exert more influence on how they want to realize projects, which requires them to have sufficient knowledge about sustainability and an approach

to engage their clients accordingly. Currently, in the process industry there are limited number of clients focusing on sustainability which makes it difficult for the EPC company to truly realize the projects in a sustainable way and achieve their strategic sustainability goal. While the EPC company has sustainability goals, plans, and strategies, implementing them at the operational level still remains challenging. As a result, this research provides insights into reducing this gap and how the EPC company may promote sustainability to differentiate themselves in the market. This research is also an attempt to respond to the lack of empirical studies on the implementation of organizational sustainability strategies and helps reveals how organizations can move towards translating strategy into action.

1.4.3 Research Questions

Given the research objective the following main research question will be answered in this thesis:

MRQ: "How can EPC contractors operating in the process industry pro-actively integrate strategic sustainability objectives into the operational level of their organization?"

To support the main research question, the following sub-question will be answered in different phases of the research:

SQ1: What elements should organizations consider while implementing sustainability strategies?

The sub-question is developed to explore how the literature relates the concept of sustainability in an organizational context. It includes investigating the interdependency of different organizational decision-making levels and determining the elements necessary to be considered for implementing sustainability strategies at the strategic and operational level.

SQ2: How do the company's strategic goals for sustainability relate to the objectives at the project level?

Based on the study of the documents, a comparison of sustainability at the strategic and operational levels is presented. To assess the strategic goals at the top level, and then to investigate in depth what aspects or objectives are considered at the operational level. To determine whether there is a gap between strategic objectives and its implementation at the operational level.

SQ3: What barriers contribute to the gap between strategic goals and its implementation at the operational level?

To identify the barriers resulting in the gap between strategic level and operational level within the organization. The question will be answered by obtaining practical data from interviews with project managers, line managers, and people within leadership. It also aims to see how these barriers affects organizations decision-making regarding sustainability.

SQ4: How can a sustainability framework be developed to enhance the implementation of sustainability at the operational level and bridge the implementation gap?

The aim of this question is to develop a framework to enhance the integration of sustainability in practice and bridge the implementation gap. It also aims to provide solutions to overcome the observed barriers and to see how the proposed solution be channeled into a practical approach. To see how the recommendations can help improve the current methods/processes within the company. Thus, along with building up theoretical relevance, the study also contributes to the practice.

1.4.4 Research Scope and Context

Setting up the scope will help establish the focus and limits of the research in terms of areas that need to be explored.

- The research focuses on how sustainability can be pro-actively integrated into the operational level of the project. This phase is particularly important for the realization of the goals set up in the initiation or planning phase of a project.
- The research is conducted from the perspective of an EPC contractor in the process industry. This is due to the high potential drive to bring in change. The results focus on providing insights on how integration can be made practical and how they can be more proactive towards it.
- The research also focuses on the adaptation of sustainability within the company, both at strategic and operational level.
- The empirical data is collected from documents review and semi-structured interviews. Documents regarding sustainability at strategic level and project level are studied. Managers from different projects, background, role and operating at different organization levels were interviewed. More details about the methodology adopted is provided in chapter 4.
- The focus is specifically on the EPC projects realized by the company (Fluor) in the energy solution business line.

1.5 Theoretical and Practical Relevance

In different ways, this study adds to the theoretical body of knowledge. There has recently been an increase in scientific research on project management and sustainability (Sabini et al., 2019; Goel et al., 2019). Many studies have focused on the content, with less emphasis paid to the integration of sustainability into the project's process (project delivery and management) (Goel et al., 2019). According to the literature, organizations realize the necessity of developing corporate sustainability strategies, but putting these plans into action at the operational level remains challenging (Marcelino-Sádaba et al., 2015; Engert & Baumgartner, 2016; Pajunen et al., 2016). The research will concentrate on project operations and will add to the body of knowledge by offering insights on the translation of strategic goals into action at operational levels. Furthermore, systematic approaches to integrating sustainability at the operational level are limited, resulting in an implementation gap. As a result, this study will contribute by providing insights towards bridging the existing gap.

Another contribution to the theoretical body of knowledge is that the research is being undertaken from the standpoint of an EPC contractor. There is currently little research on the contractor's perspective, and none on EPC contractors in process industry projects. Furthermore, while sustainability is gaining traction in other industries such as infrastructure (Goel et al., 2019), it has yet to acquire traction in the process industry. Due to its nature as a heavy user of raw materials, energy, and producer of significant environmental impacts, the process sector plays a critical role in the shift to more sustainable practices (Pajunen et al., 2016). However, no explicit link has been identified in terms of integrating sustainability into process industry projects. As a result, the overall understanding of sustainability in process sector projects would be improved. This research will shed light on the aforementioned issues while also adding to the existing body of information.

In practice, the competition between EPC companies for achieving sustainability is growing. According to Siepen and Marwaha's (2022) recent research, EPC companies face a challenge in balancing short-term demand for affordable fossil energy with long-term demand for environmentally friendly energy, and as a

result, they must acquire new capabilities to develop sustainable projects. This enhances the need to gather insights on how to improve the integration of sustainability in projects. The research will assist the EPC company in optimizing the efficacy of existing tools and procedures, making them more practical for implementation at the operational level. The EPC company is motivated to acquire insights into how high-level sustainability goals can be turned into tangible sustainability measures. The study's findings will assist project managers in developing a better grasp of sustainability processes in order to approach clients and differentiate the organization in the market. The study will present recommendations that an EPC company can employ in projects and to actively engage clients in reaching sustainability goals. The proposed framework is developed for the EPC company but with the intent that the findings can be adapted and used in other circumstances as well.

1.6 Research Strategy

The sub-questions of the research will be answered in different phases of the research. The research is divided into three phases, as follows:

- **Research Phase 1: Theoretical background**

This first phase of the research acts as a foundation for the next phases. This phase is divided into two parts: literature review & document review. This phase focuses on answering the SQ1 and SQ2.

Literature review focuses on understanding the concept of sustainability, its link with corporate organizations and investigating the elements required to implement sustainability strategies at strategic and operational level. The literature review is conducted using scientific and academic publications from various journals, reports, and books. Furthermore, it contextualizes the concept of sustainability for corporate organizations and in the process industry, delineates conditions for an EPC contractor to implement sustainability, and explore barriers to sustainability implementation. The aim of the literature is to identify the elements that an organization must considered when implementing sustainability strategies. Appendix A shows the procedure used for conducting the literature review. The literature review answers the SQ1.

Document review is one of the qualitative research approaches in which the researcher scans/studies various documents related to the research problem. The documents produced by Fluor were reviewed in this study. This includes researching internal documents and procedures in order to understand the company's strategic objectives, organizational goals, and internal processes aimed at integrating sustainability at the operational (project) level. Documents defining the company's sustainability strategy, business approach, guidelines, practices, tools, and project procedures were reviewed. This technique aids in analyzing current sustainability progress, comparing strategy and operational levels, and determining whether there is a gap between the two. Chapter 3 presents the steps followed to conduct the documents review. The document review answers SQ2.

- **Research Phase 2: Empirical research**

A qualitative research methodology is used to gather empirical data for this study. Qualitative research is useful in circumstances involving a specific phenomenon of interest, such as the topic of this thesis (Verschuren et al., 2010). Semi-structured interviews are the primary data collection method for this research. The semi-structured interview method yields rich and detailed data from a small group of participants. It also allows for flexibility in adapting questions during the interviews, upon introduction of new information (Marshall & Rossman, 2014). This method is most suitable for understanding organizational processes, people's experience, and contribute to practice improvement (Marshall & Rossman, 2014). This method also

allows the researcher to gain a thorough understanding of the subject through interaction with interviewees (Myers & Newman, 2007; Legard et al., 2003).

The goal of the semi-structured interviews was to gain insight into the practical application of elements identified through the literature review and identify the barriers to sustainability implementation resulting in gap between the strategic and operational level. Semi-structured interviews with people within the top management and project managers were conducted to gain insights into the research topic. This helped understanding managers' perspectives and investigating the challenges that an EPC contractor encounters in integrating sustainability at the operational level. This also aided in identifying projects realized by Fluor in which efforts towards sustainability integration were made. The goal of reviewing project specific documents was to determine how sustainability strategies were implemented in projects. The interviews also helped in gathering insights on how the gap between strategy formulation and operational implementation be bridged. The empirical evidence gathered also aided in the development of recommendations to overcome the barriers, thereby answering SQ3. More details about semi-structured interviews is provided in chapter 4.

- **Research Phase 3: Framework development & Expert evaluation**

Based on the findings from phases 1 and 2, the final output in the form of a framework is developed in this phase, taking into account the input offered by the interviewees. Furthermore, recommendations are made to overcome the barriers identified during the interviews. This serves as the foundation for recommending to the case company how to proactively integrate sustainability at the operational level. This phase answers the SQ4.

Furthermore, this phase also includes expert evaluation. The recommendations and the framework developed were evaluated by a particular group of people within the organization. The chosen experts have extensive knowledge on management of projects and are involved in the sustainability group within the EPC company. The goal of this phase was to evaluate the results, review the findings of this research, and discuss how the proposed solution can be channeled into a more practical approach. More details about the expert evaluation is provided in chapter 5.

- **Closing**

The final phase of the research contains a discussion, conclusion, and final recommendations. This comprises a discussion of the primary research findings and comparison of results with the literature, followed by conclusions, thereby answering the main research question. In addition, the chapter discusses the research's limitations and provides recommendations for practice and future research.

Figure 1.2 presents the flow chart of the research design.

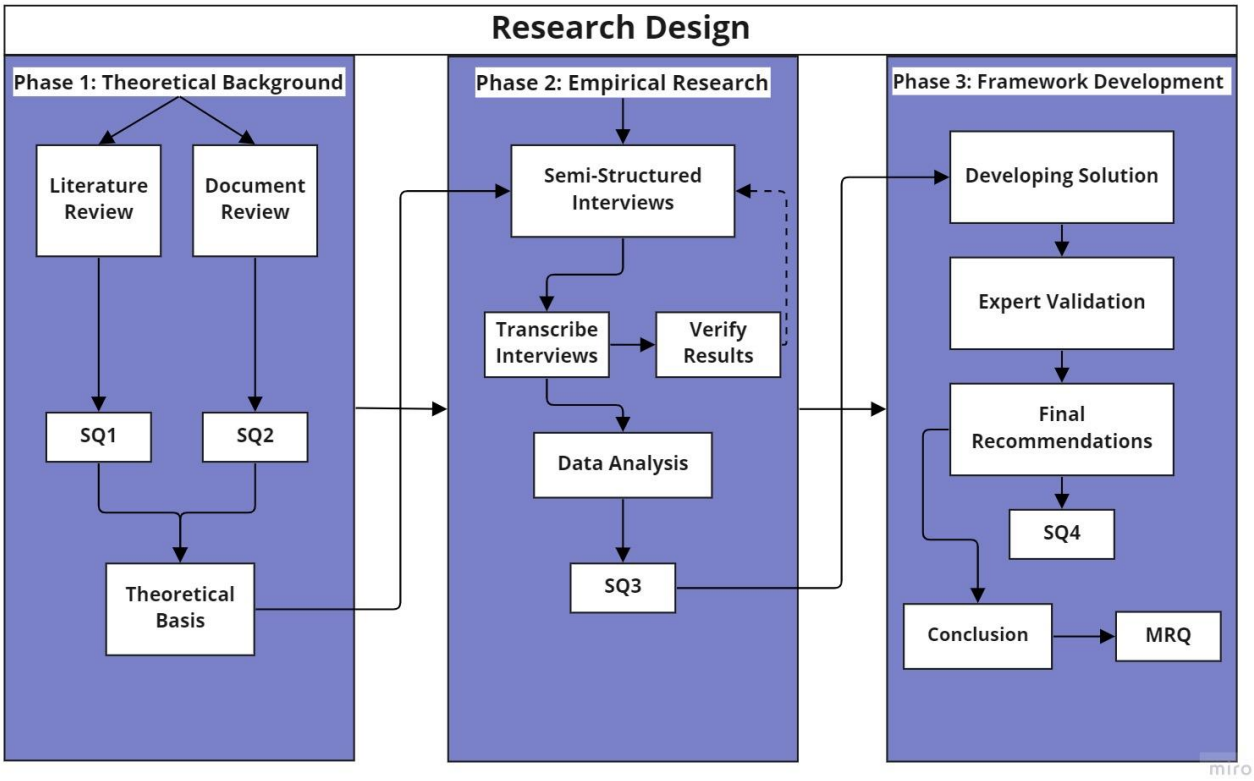

Figure 1-2: Flow chart of research design

1.7 Thesis Outline

For this thesis document, the following outline is proposed. The first phase, which is divided into two chapters, establishes the theoretical foundation for the research. The second chapter presents the literature review to answer sub-question 1, and the document review is presented in chapter 3 to answer sub-question 2. Then, in chapter 4, the results of the empirical study are presented, answering sub-question 3. Based on the findings, a framework is developed and presented in chapter 5 to address sub-question 4. The discussions and limitations to the findings are covered in Chapter 6, and the conclusion and recommendations are covered in chapter 7.

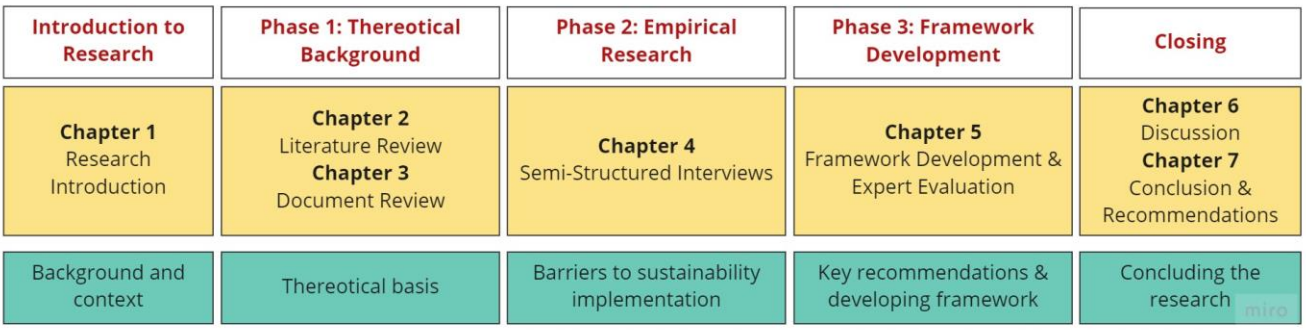

Figure 1-3: Thesis Outline

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CHAPTER 2: LITERATURE REVIEW

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CHAPTER 2: LITERATURE REVIEW

The purpose of this chapter is to gain theoretical insights into the concept of sustainability. The outcome of this chapter provides insights into the elements required to be considered for implementing sustainability strategies, answering the SQ1:

SQ1: What elements should organizations consider while implementing sustainability strategies?

This chapter is divided into four sections. The first section (2.1) elaborates on the concept of sustainability, the principle of triple bottom line i.e., people, planet, and profit, contextualizes the concept of sustainability for corporate organizations and in the process industry, delineates conditions for an EPC contractor to implementing sustainability, and presents the barriers to sustainability implementation. Section (2.2) addresses the SQ1 by looking at different decision-making levels in an organization followed by presenting the elements to be considered for implementing sustainability at strategic and operational level. This is done by gathering relevant literature, as detailed in appendix A. Section (2.3) introduces the concept of operationalization; this is done to operationalize the elements studied in section (2.2) to see the application of elements in practice. Lastly, section (2.4) provides the conclusion of the chapter and describes the next steps.

2.1 Sustainability

In this section a closer look is taken at sustainability. It is important to understand what sustainability means and what the concept entails.

2.1.1 The Concept of Sustainability

The first reference to sustainability can be traced back to the book written by Meadows et al. (1972) "The limits of growth", which is based on the principles of Club of Rome, an informal international organization that promotes understanding of the interdependent components of the global system in which we live. It was concluded that if population growth and industrialization continue at their current rates, resources would be depleted, resulting in an unlivable world for future generations (Silvius et al., 2012). It was met with a great deal of criticism, disbelief, and rejection from economists and businesses (Silvius et al., 2017), fueling public debate and eventually leading to the establishment of the United Nations (UN) 'World commission on development and environment,' also known as the Brundtland commission (Silvius et al., 2012). The Brundtland Commission issued a report titled "Our Common Future" in 1987, outlining the principles of sustainable development. The report defined sustainable development as "development that meet needs of the present, without compromising the ability of future generations to meet their own needs" (Brundtland, 1987).

This concept of sustainability provides minimal guidance to corporations on how to assess current and future demands, establish the technologies needed to address those needs, and balance responsibilities to stakeholders, society, and the environment (Talbot & Venkataraman, 2011). To conceptualize the complicated concept of sustainability, the United Nations (UN) created 17 Sustainable Development Goals (SDGs) in 2015, with the purpose of encouraging sustainability and altering the way development is seen and achieved (figure 2.1). These 17 goals are further subdivided into 169 targets that encourage activities in crucial areas for people and the planet, so adding peace and partnership to the triple bottom line. The goals have

become a reference point for both public and private policymaking, raising awareness of the importance of considering societal factors in development (Kørnøv et al., 2020). 8000 corporate organizations from 160 countries, spanning nearly every industry sector and size, have actively joined on to contribute to the SDGs' achievement (United Nations Global Compact, 2015).

Figure 2-1: The 17 sustainable development goals (retrieved from: https://sdgs.un.org/goals)

In the definition of sustainability, the term "needs" refers to the demand for a social and environmental perspective on development and performance, in addition to an economic perspective. Elkington in his book "Cannibals with Forks: The Triple Bottom Line of 21st Century Business", characterized these as the "Triple Bottom Line (TBL)" or "Triple P's: People-Planet-Profit," which must be in harmony or balance (Elkington, 1998). TBL is a concept that highlights the essence of business sustainability by quantifying a company's influence on society, the environment, and the economy during their projects or processes (Savitz & Weber, 2013). The three parts of TBL are interrelated and must be addressed holistically and in an integrated approach rather than individually. The three dimensions of the TBL framework

Figure 2-2: Triple Bottom Line (Taylor, 2020)

are sometimes known as the three P's: People, Planet, and Profit (Martens & Carvalho, 2017; Silvius & Schipper, 2010; Slaper & Hall, 2011). The profit dimension was changed to Prosperity during the 2002 World Summit on Sustainable Development. According to the UN, social profits are just as important as financial gains, therefore prosperity is widening the idea of profit to include this dimension beyond economic progress. The three P's can be described as follows:

- **Economic- Profit (Prosperity):**

The economic dimension's primary goal is to deal with the bottom line and cash flow (Slaper & Hall, 2011). It considers the financial costs and benefits of a project throughout its life cycle and maximizes the financial gains and flow of income from projects for the benefit of project stakeholders (Dyllick & Hockerts, 2002). The focus of the economic dimension is on a company rather than society. The economic line connects the company's growth to the growth of the economy and how well it contributes to it (Arowoshegbe et al., 2016). It highlights the organization's economic value to the surrounding system in a way that benefits the organization while also enhancing its potential to support future generations.

- **Social- People:**

The social variables indicate all of the social characteristics of the area or community in which the organization's or project's functions or activities take place (Slaper & Hall, 2011). It refers to engaging in useful and equitable business practices with regard to labor, human capital, and the community (Elkington, 1998). It includes both the company's human capital and the societal capital of the operational environment (Dyllick & Hockerts, 2002). Human capital refers to intangible assets of individuals such as skills, motivation, knowledge, and other intangible assets that can add economic value to an organization or community. The quality of governmental services and cultural support that enables a society to function is referred to as societal capital. One critical component is managing stakeholders so that they understand the company's ideals.

- **Environmental- Planet:**

TBL's environmental line refers to practices that do not jeopardize the environment's resources for future generations (Arowoshegbe et al., 2016). Environmental elements are the factors that reflect the type and quality of natural resources that a project may have an impact on. It encompasses air and water quality, energy consumption, natural resources, waste (solid/toxic), land usage consumption, and minimizing environmental footprint (Slaper & Hall, 2011). It is more specifically about ensuring that projects do not exceed nature's ability to absorb and assimilate emissions, hence diminishing ecosystem services (Dyllick & Hockerts, 2002).

The TBL is a guideline that can be used to handle all three dimensions, however there is a distinct emphasis on profit in project management practices. According to the TBL approach, corporations are not only responsible for making a profit for their shareholders, but they are also responsible for the environment and the society in which they operate. Although principles of sustainability such as TBL exists, a lack of sustainability in projects seems to persist. Sustainability calls for thinking outside the traditional project management boundaries i.e., cost, quality, and time, which the current project managers are not used to (Kivila et al., 2017). As TBL entails, projects should not only look at economic aspects but also integrate social and environmental aspects. This, however, also brings along the complication of the ambiguous nature of sustainability. Additionally, many organizations have had a skewed view of sustainability and are focused only on environmental issues. However, integrated view of sustainability is extremely important as all three aspects are connected and interrelated (Meehan, 2011). Organizations are being forced to incorporate

sustainability components into their corporate strategy as there is a growing awareness of the importance of addressing sustainability and adopting TBL into business processes (Peenstra & Silvius, 2017).

For this research, the triple bottom line principle is crucial as it gives equal importance to the social, economic, and environmental aspects. Furthermore, the case company (Fluor) defines sustainability in accordance with the TBL principle. As this research continues to investigate the integration of sustainability in projects, it is critical to see how the case company considers the TBL principle within the project environment and how the case company's strategic objective in accordance with TBL are reflected in practice at the operational level. This will be further delineated through empirical study in this research.

Section 2.1.2 discusses sustainability in the perspective of corporate organizations.

2.1.2 Sustainability in Context of Corporate Organization

To have a better knowledge of how sustainability aspects are integrated into corporate strategy, literature on corporate sustainability strategies, corporate strategy implementation process, interdependency between different organizational levels, and the role of sustainability is explored.

To be considered sustainable, organizations' business performance and outcomes must be linked with the triple bottom line principle of People, Planet, and Prosperity (Afzal et al., 2017). The consideration of sustainability in business is frequently referred to as 'corporate sustainability.' Corporate sustainability is defined by the International Institute for Sustainable Development as "*adopting business strategies and activities that meet the needs of the enterprise and its shareholders while protecting, sustaining, and enhancing the human and natural resources that will be needed in the future*" (IISD, 2001).

Implementing sustainability strategies necessitates organizations not only changing their services, business model, policies, processes and resources (Silvius & Marnewick, 2022), but also creating new agendas, innovating and adapting their businesses, and integrating new business needs (Machado et al., 2017). In general, corporate sustainability strategies encompass activities such as resource efficiency, waste and discharge management, upholding adequate ethical standards, transparency with stakeholders, environmental protection, and the development of creative skills (Epstein & Buhovac, 2014; Silvius & Schipper, 2014). To maximize the predicted payoffs, the organization must tailor the sustainability plan around the firm's unique demands and operational environment (Epstein & Buhovac, 2014; Silvius & Schipper, 2014).

However, effective implementation and success measurement remain difficult (Marcelino-Sádaba et al., 2015). Epstein and Buhovac (2014) propose a business sustainability model that incorporates social, environmental, and economic elements as its foundation for successful implementation of a sustainability approach. According to Epstein and Buhovac (2014), external context, internal context, business context, and human and financial resources should all be considered. These inputs serve as a foundation for managers' decisions and the actions that the organization implements to promote sustainability.

- **External Context:** relates to the local and global operational environment, as well as government regulations/legislation and geographical factors to be considered.
- **Internal Context:** refers to an organization's vision, mission, strategy, and structure that enable sustainable performance, as well as the impact these have on the three dimensions of TBL.
- **Business Context:** relates to the organization's industrial sector as well as the characteristics of its clients and services.

- **Human and Financial Resources:** relates to an organization's resource constraint, which includes the ability to pay for sustainability programs, educate, and train employees.

By examining these inputs and their expected impact on sustainability, organizations can build appropriate methods to improve their sustainability performance. To effectively incorporate these inputs into the corporate sustainability model, organizational change management is required (Sroufe, 2017). It encompasses changes to organizational structures such as vision, leadership, policy, and so on. It is critical to establish the value of sustainability in accordance with the organization's vision and mission (Sroufe, 2017). According to Haugh and Talwar (2010), achieving an organizational transformation toward sustainability necessitates alignment across the organization. Traditional business approaches that prioritize commercial gains over environmental and social objectives impede organizations' transition to sustainability (Sullivan et al., 2018).

The next section presents sustainability in the context of the process industry sector to explore industry-specific characteristics related to sustainability integration and further delineate the perspective of the EPC contractor in particular.

2.1.3 Sustainability in the Process Industry Sector

Sustainability has recently been a key issue for organizations in the process industry to implement changes to their competitive strategies and business structures. Because of its high use of raw materials and energy, the process sector is critical to the transition to sustainable development (NAP, 2013). Multiple stakeholders/shareholders, market incentives, and cost variables substantially affect strategic decisions about sustainability in the process industry (Pajunen et al., 2016). Process sector initiatives are frequently complex, ambiguous, and include a diverse set of stakeholders (Bosch-Rekveldt et al., 2018). These are high-risk projects that are frequently carried out by a single entity, such as an EPC contractor, because the contractor bears the project risk, not the client. This has resulted in a major improvement in the negotiation position of EPC contractors (Loots & Henchie, 2007). As a result, these projects can help EPC contractors meet their sustainability goals. These projects, on the other hand, present a unique challenge, such as high environmental impacts, water and waste management, and impact on local community and environment (McPhee & Dias, 2020), and introduce the risk of overlooking the interrelationship between the three dimensions and considering social, environmental, and economic impacts separately (IPIECA, 2015).

Sustainability research in the process sector has mostly focused on developing or measuring sustainability indicators to manage the trade-offs between social, economic, and environmental repercussions (NAP, 2013; IPIECA, 2015; Okeke, 2021; Te Liew et al., 2014; George et al., 2016). The fundamental strategy for controlling and maintaining sustainability has been identified as the production of these quantitative performance indicators. However, rather than the process of delivering such assets, the primary focus is on boosting the sustainability of existing assets (NAP, 2013). Furthermore, many of the economic benefits of sustainability in projects are intangible, making assessment challenging (McPhee & Dias, 2020). Quantifying hazardous waste generated, for example, is easier than measuring the impact of operations on society. The organization that realizes a certain asset is responsible for implementing sustainability at operational level. According to Process Industry Network (NAP) and IPIECA, the present focus of industry is on decreasing GHG emissions, CO2 emissions, effective waste and water management, health and safety, energy usage, human rights, and business ethics. Sustainable solutions must be used by organizations in the process industry to ensure business continuation. The next section outlines an EPC contractor's perspective on incorporating sustainability into projects.

2.1.4 Conditions for an EPC Contractor to Implement Sustainability

Projects in the process industry are typically delivered in accordance with the client's requirements with decentralized decision making (McPhee & Dias, 2020). These kinds of projects are an excellent way for contractors to achieve corporate goals and effect change (Silvius et al., 2012). As seen in figure 2.3, currently an EPC contractor is involved in the engineering, procurement, and construction phase and/or in design or maintenance phase. If the design is developed by the client then the EPC contractors position to influence the design is relatively less. Over the period of time, the borderlines between design and EPC and between EPC and operations will be gradually reduced. This will result in almost 90% of the work scope of projects performed by the contractor, implying the possibility of triggering sustainability considerations to add value (Bakker & de Kleijn, 2015).

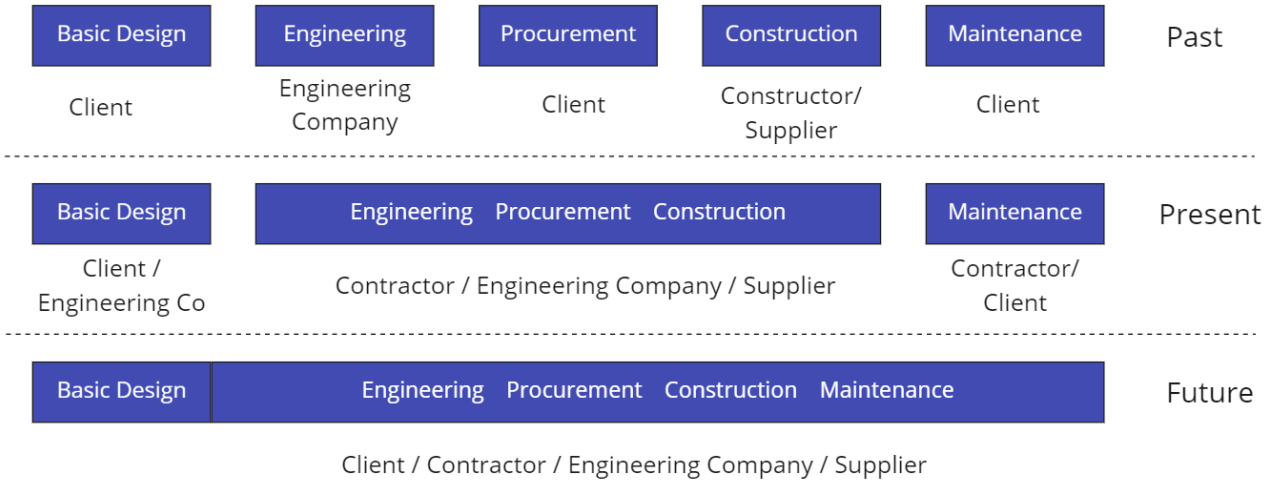

Figure 2-3: Development in the process industry (Retrieved from: Bakker and de Kleijn, 2015)

The front-end development phases are important to the success of the project. When implemented and defined as early as possible in projects, sustainability strategies yield the most benefits (Goel et al., 2019). The potential to create value is considered to be greatest in the early stages, when several solutions to problems can be examined with minimum impact (McPhee & Dias, 2020). Consideration of a sustainable design necessitates additional and distinct design requirements from traditional considerations. As a result, the early stages are crucial for optimizing design solutions toward low-cost sustainable attempts (Epstein & Buhovac, 2014).

Most process industry clients are private firms that are more concerned with traditional constraints such as cost, time, quality, and safety than with sustainability (Pajunen et al. 2016). Because sustainability is determined by the client's willingness to pay, the contractor simply completes the project according to the client's requirements and standards. A typical energy and chemicals project is divided into phases, each having a set of critical actions to be performed at the end. The project lifecycle of E&C projects is depicted in Figure 2.4. The client begins the projects and is responsible for funding, design specifications, and project sustainability requirements in a conventional EPC contract (McPhee & Dias, 2020). The preliminary design phase (FEED) is contracted separately from the contract for detailed engineering, procurement, and construction. EPC contractors are either involved from the FEED phase until the project is completed, or they are only involved in the FEED or EPC phases. Following that, the contractor creates the basic design and calculates the expenses, which is followed by detailed design, engineering, procurement, and

construction. When FEED is not included, the client may develop the preliminary design themselves. After that, an EPC contractor is assigned to bid on the job based on FEED (Loots & Henchie, 2007). This phase is critical for a contractor because a successful bid will result in business profitability and continuity. Cost competitiveness, on the other hand, remains an important driver in this phase, as clients attempt to advance cost efficiency. To gain a substantial competitive advantage in the market, contractors must provide more than just cost-effective services (Tan et al., 2011). To differentiate themselves from the competition, contractors should actively build their corporate values. Proactively implementing sustainability rather than simple reacting can be a point of differentiation and, as a result, a huge business potential for contractors (Peenstra & Silvius, 2017).

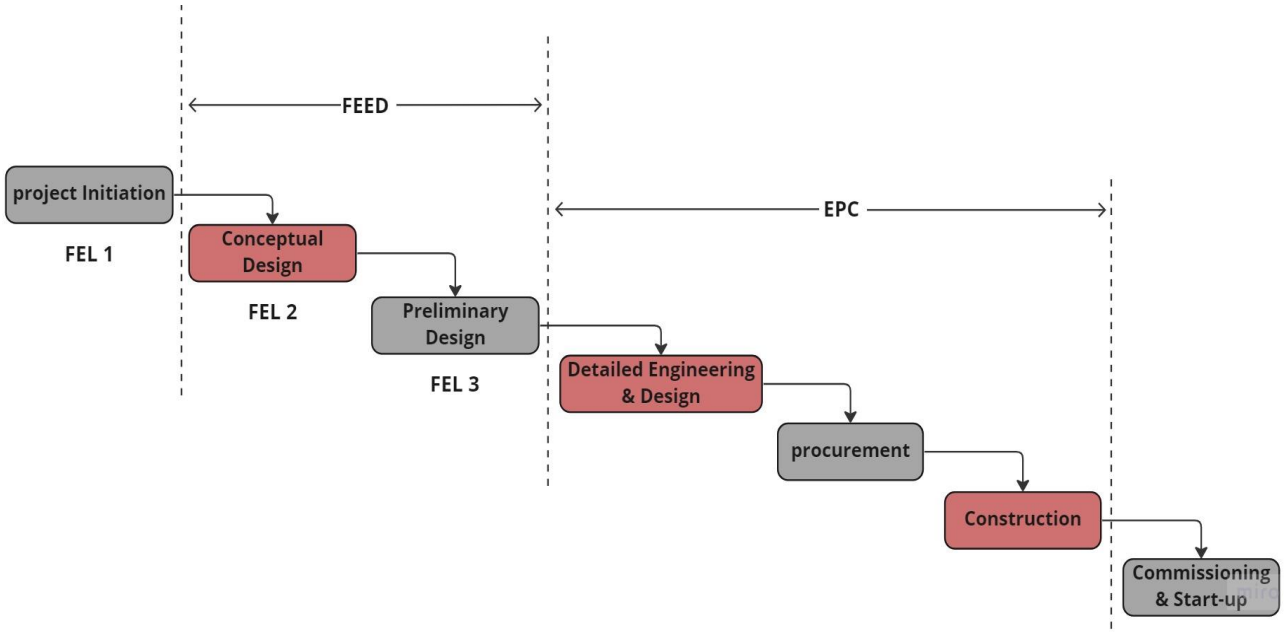

Figure 2-4: Typical EPC project life cycle (own figure, based on: Carlson et al., 2007)

According to Too and Weaver (2014), the proposal manager/team determines the methods and procedures to be implemented in order to win the project and achieve corporate objectives. As a result, the appointed manager or team from the contractor side is in charge of implementing sustainability. However, integrating sustainability at the operational level is a difficult process (Sabini et al., 2019). It necessitates a shift in focus from controlling time, budget, and quality to managing social, economic, and environmental consequences (Silvius & Schipper, 2014). Furthermore, it is not clear what complexities EPC contractors experience at the operational level when integrating sustainability (McPhee & Dias, 2020).

The next section presents the barriers to sustainability implementation identified from the literature. The identification of barriers will help in comparing those in practice and in developing adequate response strategies.

2.1.5 Barriers to Sustainability Implementation

Barriers are impediments in processes that may contribute to failure in the adoption of sustainability goals in construction organizations (Ershadi et al., 2021). Identifying such constraints allows businesses to develop better strategies for embracing sustainability at various levels. The following are the barriers to sustainability implementation highlighted in the literature study:

1. Internal Barriers:

- A major internal barrier to attaining sustainability goals is a **lack of communication** across different decision-making levels and departments (Ershadi et al., 2021; Engert & Baumgartner, 2016). Lack of consistent communication in words and actions about social, environmental, and economic consequences (Epstein & Buhovac, 2014).
- **Inadequate cross-functional integration** at all levels of decision-making (Hanh et al., 2015; Epstein & Buhovac, 2014; Peenstra & Silvius, 2018; Fathalizadeh et al., 2021).
- Sustainability is still viewed as a ambiguous and complex notion that must be understood before it can be translated into action (Sroufe, 2017). **Lack of awareness** of the concept of sustainability and the possible benefits of proactive sustainability measures (Fathalizadeh et al., 2021). **Lack of understanding and clarity**, because implementing sustainability is fundamentally different from implementing other organizational strategies (Epstein & Buhovac, 2014). These are the most common hurdles because managers are unsure how to put goals into action (Wijethilake, 2017; Peenstra & Silvius, 2018).
- Managers' **lack of motivation and proactive attitude** toward achieving sustainability goals (Epstein & Buhovac, 2014; Engert & Baumgartner, 2016; Peenstra & Silvius, 2018).
- The **absence of a performance measurement and reporting system** to quantify the efficiency and efficacy of an organization's efforts toward sustainability (George et al., 2016; Peenstra & Silvius, 2018).

2. External Barriers:

- One of the primary barriers to sustainability is a **lack of consensus** among stakeholders, as addressing concerns about the triple bottom line may result in mutually exclusive results (Ershadi et al., 2021).
- The incorporation of sustainability into projects is heavily reliant on the **client's willingness to pay**. Clients are more concerned with project costs in order to ensure short-term returns (Peenstra & Silvius, 2018; Epstein & Buhovac, 2014), whereas sustainability is viewed as an **additional cost** that may conflict with their profit value driver (Goel et al., 2019).
- **Inadequate industry-specific norms and standards**, with a strong emphasis on economic growth (Stewart et al., 2016; George et al., 2016). The high financial cost of enhancing social and environmental performance, combined with an emphasis on short-term profits, poses a dilemma in balancing the triple bottom line (Epstein & Buhovac, 2014).
- A **lack of incentives** in contracts for attaining sustainability targets (Fathalizadeh et al., 2021; Wijethilake, 2017; Goel et al., 2019; Ershadi et al., 2021) and for organizational management to accomplish strategic sustainability goals (Engert & Baumgartner, 2015; Epstein & Buhovac, 2014).

Because of a lack of structured approaches to sustainability implementation, sustainability objectives stay at the strategic level (Epstein & Buhovac, 2014), with little clarity on what is needed to operationalize them (Wijethilake, 2017). As a result, it is necessary to first study key elements that must be taken into account while adopting sustainability strategies. Then, determine whether the aforementioned barriers exist in practice and to what extent the identified elements are operationalized in practice.

2.2 Implementation of Sustainability Strategies

As stated in the preceding section, a proactive plan for sustainability necessitates the modification of organizations processes, services, business model, and resources (Silvius & Marnewick, 2022). Projects, which are viewed as the present vehicle for change, thereby have an important role in implementing these organizational changes (Marcelino-Sádaba et al., 2015; Silvius et al., 2017; Garies et al., 2013). The Project

Management Institute defines projects as *"A temporary endeavor undertaken to create unique product, service, or result"* (Project Management Institute, 2017). It is temporary in the sense that it has a specified beginning and ending, and unique in the sense that it is a collection of distinct procedures designed to achieve a certain goal. To develop corporate value through projects, the projects must be connected with the organization's corporate strategy (Too & Weaver, 2014). If the corporate strategy aims to incorporate sustainability pro-actively, projects as well as the available resources and capabilities should be chosen in accordance with these strategic objectives (Schuylenburg, 2019). The alignment of project management with the planned organizational strategic objectives is linked by good governance. Building a culture of trust, openness, and accountability is essential for long-term business continuity, investment, and overall success. The use of good governance is critical for the development and implementation of sustainable practices and policies.

Integrating sustainability strategies entails five essential elements that must be considered both strategically and operationally. Organizational decision-making (Too & Weaver, 2014; Labuschagne & Brent, 2005), life cycle thinking (Labuschagne & Brent, 2005), stakeholder engagement (Eskerod & Huemann, 2013), balancing the three dimensions of sustainability (Silvius & Schipper, 2014), and a proactive approach (Silvius et al., 2012) are all part of it. The elements are explored in detail in the subsections that follow.

2.2.1 Organizational Decision-Making Levels

Involving sustainability in an organization is a challenging endeavor since it necessitates the involvement of different organizational levels (Chofreh & Goni, 2017). The scope of sustainability differ at each level of decision making, and decision makers at each level are required to steer management toward an effective sustainable outcome (Chofreh & Goni, 2017). According to Too and Weaver (2014), three layers of decision making can be recognized in project-based organizations for managerial decision making:

1. **Strategic level-** is accountable for long-term company performance and relates to strategic objectives and goals that must be applied to different organization levels.
2. **Tactical level-** these decisions turn strategic aims and objectives into concrete plans and initiatives. It entails directing funding to specific projects that achieve the organization's strategic goals (Silvius et al., 2012).
3. **Operational level-** are intended to accomplish the implementation of organization's strategic and tactical decisions. Executes tasks at project level.

Figure 2.5 depicts the interdependence of these levels as well as the tasks assigned to each level in a project-based organization. The tactical level connects the strategic and operational level. This indicates that project-related choices are impacted not just by the project manager, but also by the strategic and tactical levels. There is a top-down and bottom-up approach, with project-level feedback feeding into strategy formulation.

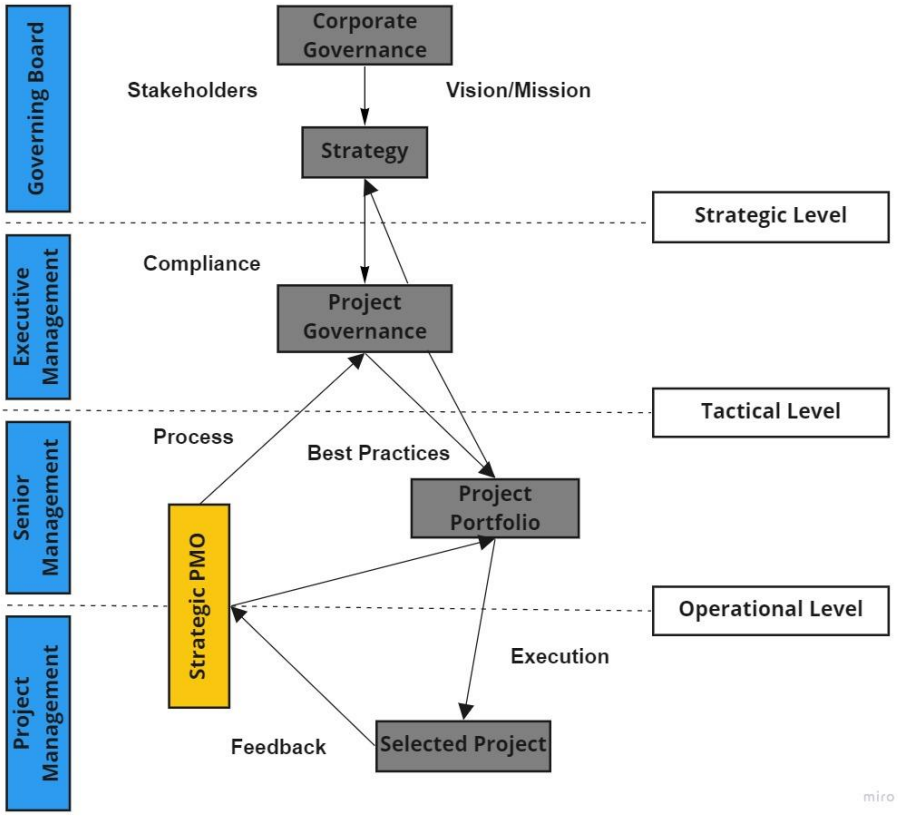

Figure 2-5: Decision-making levels of project-based organization (own illustration, based on Too & Weaver, 2014)

Sustainability is integrated at the strategic level through the organization's vision/mission and strategy (Labuschagne & Brent, 2005). All stakeholders' interests are taken into account in order to achieve a win-win outcome (Silvius et al., 2017). Sustainability strategies are often effective when top management demonstrates strong commitment in words and actions (Epstein & Buhovac, 2014). In addition to presenting the strategies, an atmosphere for promoting sustainability and exchanging valuable knowledge should be created..

The tactical level connects the strategic and operational levels. To realize the value described by corporate strategy, an organization's project process and outcome must be aligned with the organizational goals (Too & Weaver, 2014). Sustainability concerns are intricate and can be classified as wicked problems. To address these concerns and connect the sustainability strategy to the project deliverables, plans involving performance criteria reflecting the organizational strategic vision/mission must be devised (Silvius & Marnewick, 2022). The project's stakeholders and the environment necessitates exploration of sustainability aspects and exploitation of necessary resources (Marcelino-Sádaba et al., 2015).

On the operational level, the project execution is focused on establishing tangible targets in response to the plans and goals. At this level, integration entails the implementation of performance measuring systems, indicators, reporting techniques, and the evaluation of operations (Labuschagne & Brent, 2005; Engert & Baumgartner, 2016). As they have a lot of influence on the implementation of sustainability in projects, the allocated project manager is responsible for taking suitable actions to monitor performance (Silvius et al., 2017).

2.2.2 Lifecycle Thinking

A rising number of research are focusing into the relation between sustainability and project management. The relationship is interpreted in two ways in the literature: the sustainability of project deliverables and the sustainability of the process of managing and delivering projects (Silvius & Schipper, 2014; Kivila et al., 2017; Labuschagne & Brent, 2005). The necessity for sustainability puts a strain on both the project deliverables and the project delivery process (Marcelino-Sádaba et al., 2015). The process and product characteristics are intricately intertwined and can have significant social and environmental consequences (Kivila et al., 2017; Silvius, 2018). According to Labuschagne and Brent (2005), traditional project management methodologies do not take into account social and environmental challenges, and a life cycle thinking approach is required for processes to align with sustainability. Life cycle thinking is a means of considering a product's environmental, economic, and social impact over its full life cycle (Jacob-Lopes et al., 2021). According to Labuschagne and Brent (2005), the life cycle of project deliverable should be considered in addition to the whole life cycle of the project. In addition, Silvius et al., 2012, proposes that the project's supply chain, including the life cycle of the resources used, also be considered.

In the construction sector, the project's outcome may be an organizational change, a new policy, or an improvement in strategic objectives rather than an asset. Given the transient nature of projects (Silvius et al., 2012), organizations generally focus on the project's life cycle and are biased towards short-term profits, ignoring the influence of human and project actions on the society and the environment (Armenia et al., 2019). EPC contractors benefit from the life cycle thinking approach because they have influence over the whole project life cycle (as described in section 2.1.4), allowing them to implement sustainability objectives to accomplish their own strategic goals. A typical construction project goes through the stages of initiation, planning, execution, monitoring and control, and closure. Figure 2.6 depicts the many life cycles involved in a process industry project, which link the process of delivery and project deliverables.

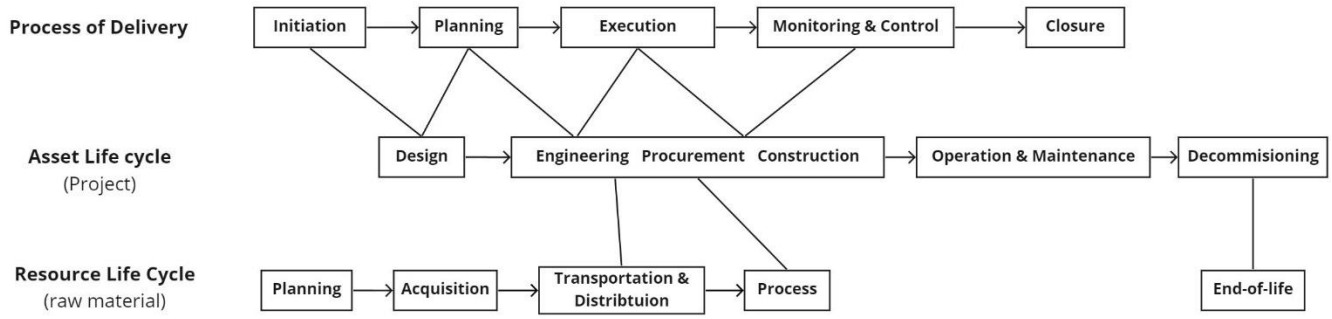

Figure 2-6: Interaction of various life-cycle phases (own illustration, based on: Labuschagne & Brent (2005); Molenaar (2021))

The purpose of the initiation phase is to conduct feasibility studies that will lead to project investment. The design phase allows for the evaluation of numerous design, construction, and material options that will result in the project's high sustainable performance. Furthermore, the procurement process includes the selection of sustainable materials, minimizing the carbon footprint, and the construction phase includes waste minimization and resource efficiency. The operating phase includes continual monitoring, while the demolition phase allows for material recycling.

The social and environmental consequences cannot be observed in the short term, necessitating a long-term perspective. To reach long-term strategic objectives, organizations must sustainably maintain a balance between short- and long-term outcomes, as well as with various stakeholders throughout the project life cycle (Armenia et al., 2019). According to the emerging literature in project management, life cycle thinking

has proven to be a significant component in decision making and project success (Silvius & Schipper, 2016; Armenia et al., 2019). To effectively accomplish their strategic sustainability objectives, the EPC company must understand the many life-cycle phases in a project and their interactions (Carvalho & Rabechini, 2017). However, it is unclear how the EPC company addresses sustainability across the various stages of the project life cycle. There is a need to explore how the EPC company evaluates and assesses sustainability, what challenges are encountered, and how it might benefit them in order to improve the project's sustainability performance.

2.2.3 Stakeholder Engagement

Stakeholder management is one of the most significant aspects of project management because project success is determined by stakeholder satisfaction (Armenia et al., 2019). The construction industry environment is thought to be highly fragmented, with involvement of multiple parties such as government agencies, clients, contractors, subcontractors, suppliers, and consultants spread across different regions (Silvius et al., 2012). Several stakeholders from both the client and the contractor are involved in a typical EPC project (figure 2.7). According to Shen et al. (2007), project partners are active at various stages of the project life cycle and are likely to focus on their own management activities or individual perspectives. This fragmentation can result in discrepancies between expected and actual project quality, resulting in project goals not being met (Leoto & Lizarralde, 2019). This is especially true for big EPC projects with several stakeholders, each with their own set of goals and perceptions of sustainability value (McPhee & Dias, 2020; Armenia et al., 2019). To accomplish sustainability through projects, an EPC company need efforts and cooperation from multiple supply chain partners to actively collaborate towards one shared goal (Marcelino-Sádaba et al., 2015; Kivila et al., 2017; Schuylenburg, 2019).

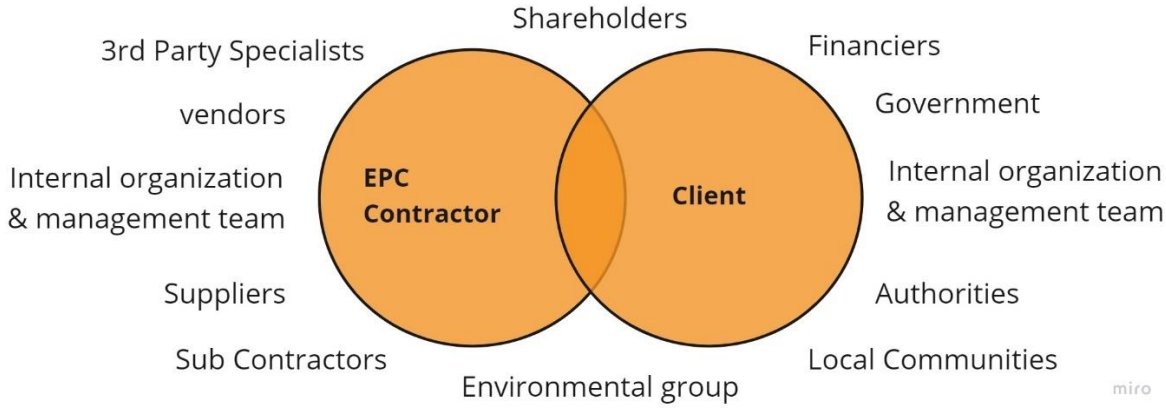

Figure 2-7: Key stakeholders to be managed (own illustration)

According to ISO 26000, one of the fundamental concepts of sustainability, is proactive stakeholder engagement (International Standards Organization, 2010). The addition of sustainability and the need to balance social, economic, and environmental concerns is likely to increase the number of project stakeholders (Silvius & Schipper, 2014). Companies ought to have greater control over internal organizational elements such as corporate strategy, people, resources, structure, culture, and financial capacity in order to execute sustainability (Schuylenburg, 2019). The external environment, which is dependent on the socioeconomic, regulatory, and technical background, also has an impact on the project (ISO, 2012). This implies that an organization has the least influence over the behavior of its clients, markets, and other stakeholders. Because the project is aligned at the interface, the organization faces an extra challenge in aligning its decision-making

with other stakeholders. For example, the value creation or advantages of a project can change between an EPC contractor and the client and seem different at different stages of the project, making it difficult to meet the project goal (Kivila et al., 2017). The environment in which the EPC company operates is depicted in Figure 2.8. the level of control diminishes from internal to interface (project) to external context.

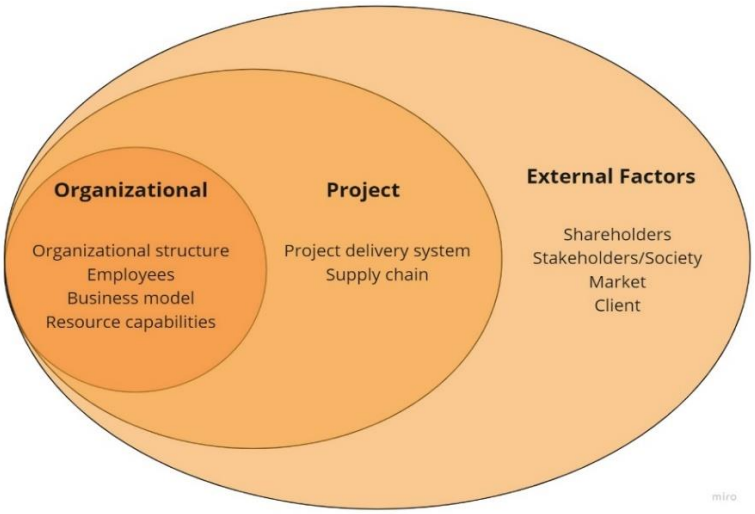

Figure 2-8: Decreasing level of influence for an organization (own illustration, based on: McPhee & Dias (2020))

In the process industry projects, clients are responsible for funding project-related sustainability efforts (McPhee & Dias, 2020). Although these projects tend to have significant environmental and social impact, the client's willingness to pay is the primary driver of sustainability. Companies involved in the project (client or contractor) are big corporations driven by stock markets and frequently overemphasize short-term gains over long-term success (Pajunen et al., 2016). Because the financial benefits of implementing sustainability are unknown, they are typically overlooked when considering sustainability in projects (Sabini & Alderman, 2021). The external environment has a significant impact on the strategic decisions that an organization makes for the project. Traditionally, project managers focus on the stakeholders (clients) needs and manages the project team in line with the client's scope, risks, budget, and requirements (Silvius, 2018). According to Ershadi et al., (2021), Silvius et al., (2012), and Silvius (2018), exploring possibilities for integrating sustainability in projects requires a shift in project managers' mindset. This indicates that managers must be more proactive than reactive in engaging stakeholders in accomplishing sustainable goals. This transformation must also take place at the corporate level through procedures, vision, mission, and strategy. Organizations that are resistant to change put themselves at risk and are vulnerable to external factors such as clients (Sroufe, 2017).

There is a lack of empirical evidence on how the external context affects project decisions and sustainability implementation. To determine the level of control that the EPC company has, it is vital to examine the impact of the external environment on sustainability decision making. It is unknown to what extent the projects' and client's sustainability goals are linked, and what forms of conflicts related to the sustainability objectives of different stakeholders (client and EPC contractor) may occur.

2.2.4 Balancing Social, Economic, and Environmental Impacts

Traditionally, project management has been governed by triple constraint variables (the iron triangle): cost, time, and quality (Project Management Institute, 2017). These triple constraint variables prioritize profit while ignoring social and environmental concerns (Silvius & Schipper, 2012). In order to include

sustainability into projects, the focus must move from controlling time, money, and quality to managing social, environmental, and economic implications (Larsson & Larsson, 2020). The conventional scope of managing the iron triangle variables suggests a level of predictability and control that is contradictory to long-term sustainability perspective (Silvius & Schipper, 2014).

The balancing of the three Ps involves organizational-wide efforts to examine the effects of actions on sustainability performance (Epstein & Buhovac, 2014). As a result, several functional areas within the organization will be impacted, necessitating each of them to promote sustainability and assist the organization in meeting its sustainability and financial goals. For example, the process sector consumes a large amount of raw materials and has a significant environmental impact (Pajunen et al., 2016). As a result, the project's materials, components, and resources should be sourced from sustainable sources and should consider the environmental impact throughout the lifecycle (Epstein & Buhovac, 2014). Figure 2.9 depicts the balance of the three pillars in order to produce value for companies in the process industry and the oil and gas sector. The industry, as a significant user of raw materials and energy, contributes for more than 39% of worldwide carbon emissions (TEBO Group of Industries, 2022). As a result, an EPC contractor must strike a balance between social, environmental, and economic repercussions and make appropriate trade-offs to minimize their operational impact.

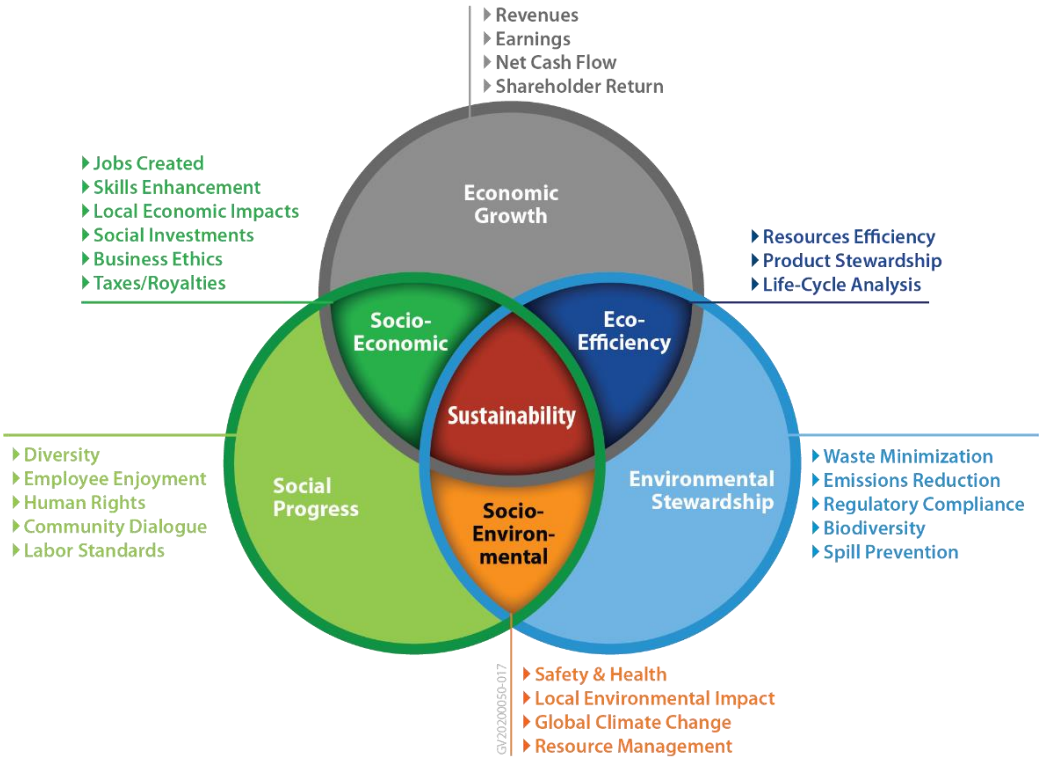

Figure 2-9: Value creation by balancing three pillars of sustainability (retrieved from: IPIECA, 2015)

According to Martens and Carvalho (2016), the consideration of triple bottom line sustainability dimensions is related to project context and strategy. The relationship with the strategic point of view varies depending on the project. Managers must understand the notion of sustainability and the implications of organizational actions on society and the environment in order to achieve a greater degree of sustainability integration and improved decision making (Epstein & Buhovac, 2014). While it is easier to balance an organization's TBL implications, on projects, additional concerns are still not reflected in practice. Despite efforts to balance TBL concerns when planning and delivering projects, evidence reveals that the economic dimension

continues to dominate project decision making. The principle of balancing TBL implications is being approached in a more reactive manner. As a result, exploring trade-offs between the triple- P's is crucial since it will provide insights into the conditions under which managers can produce economic growth while also achieving social and environmental goals. There is a need to investigate how the EPC company's strategic direction in relation to this principle is followed out in practice. To determine the level of proactiveness it is important to see how the EPC company achieves the balance of social, environmental, and economic aspects on their actions at the strategic and operational levels in practice.

2.2.5 Proactive Approach Towards Sustainability

Organizations enhance their processes by using strategies and techniques. According to ISO 26000, integrating sustainability necessitates a proactive approach in engaging, collaborating, and communicating with potential stakeholders (International Organization for Standardization, 2010). A proactive approach to sustainability improves an organization's sustainability performance by reducing waste and discharge, increasing cost advantage, improving stakeholder involvement, and increasing inventive capabilities (Wijethilake, 2017). Open and transparent communication with stakeholders is a crucial element of a proactive approach. This indicates that an organization is transparent about its policies, decisions, or activities and provides timely, clear, and relevant information to project stakeholders (Silvius et al., 2012). With increasing regulations and demand from various stakeholders, it is critical for an EPC contractor to implement responsible practices in order to reduce the impact of their activities. These organizations can be held accountable for causing significant social and environmental harm to society (Okeke, 2021). Organizations must be proactive in their approach to sustainability, not only internally, but also in advising clients about the sustainability options available to them. Figure 2.10 depicts the difference between a reactive and proactive approach to sustainability.

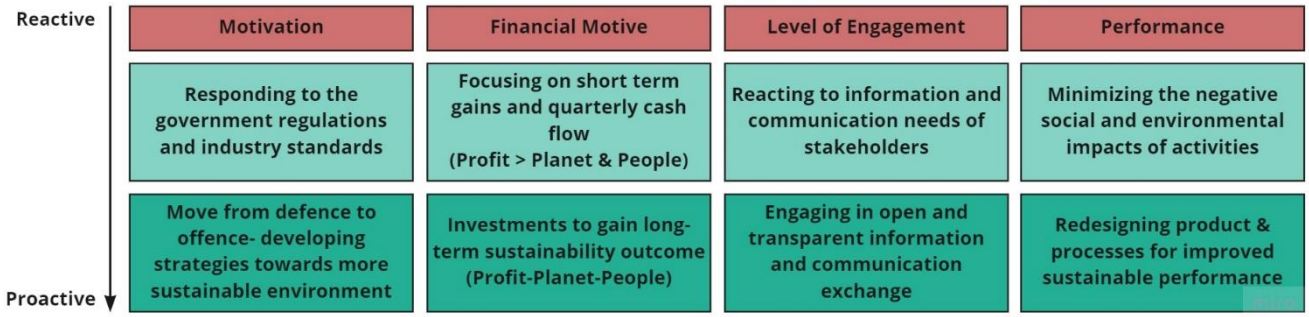

Figure 2-10: Difference between reactive and proactive approach (own illustration, based on: Epstein & Buhovac, (2018); Silvius et al., (2012))

Willard (2005) developed sustainability stages for a company in his research, varying from reactive to proactive levels sustainability. According to this model, a reactive approach to sustainability is related with meeting regulations (level 2- compliance), whereas different levels of proactivity are when a company not only begins voluntarily implementing sustainability activities (level 3) but also becomes a sustainable business themselves (level 4). According to Silvius et al. (2012), organizations with a reactive approach seek to balance negative social and environmental aspects by trading against the financial perspective. In large engineering projects, for example, offsetting CO2 emissions by planting trees or compensating unhealthy work conditions with greater wages. A more proactive strategy would be to change processes, or services in order to achieve a balance of all three components of sustainability on a project. Finally, contributing to

sustainability is recognized when organizations are driven not only by profit but also by a desire to improve society and the environment. This is especially applicable for organizations in the process industry, which are influenced by the stock market and prioritize short-term benefits by focusing on quarterly performance (Pajunen et al., 2016). It is a paradigm shift from viewing sustainability as a threat or an expense to viewing it as a business opportunity (Silvius et al., 2012).

Figure 2.11 depicts the various stages of an organization's approach to sustainability (from reactive to proactive) from both an organizational and project standpoint. Sustainability levels range from compliance to purpose and passion. It indicates a shift in perspective, from sustainability as an external factor to sustainability as a business driver. When all people of an organization understand the significance of the processes and proactively consider sustainability in daily decision-making, the organization is then considered proactive toward sustainability. The model's insights will be used to evaluate the EPC company's level of proactiveness on both strategic (corporate) and operational (project) level.

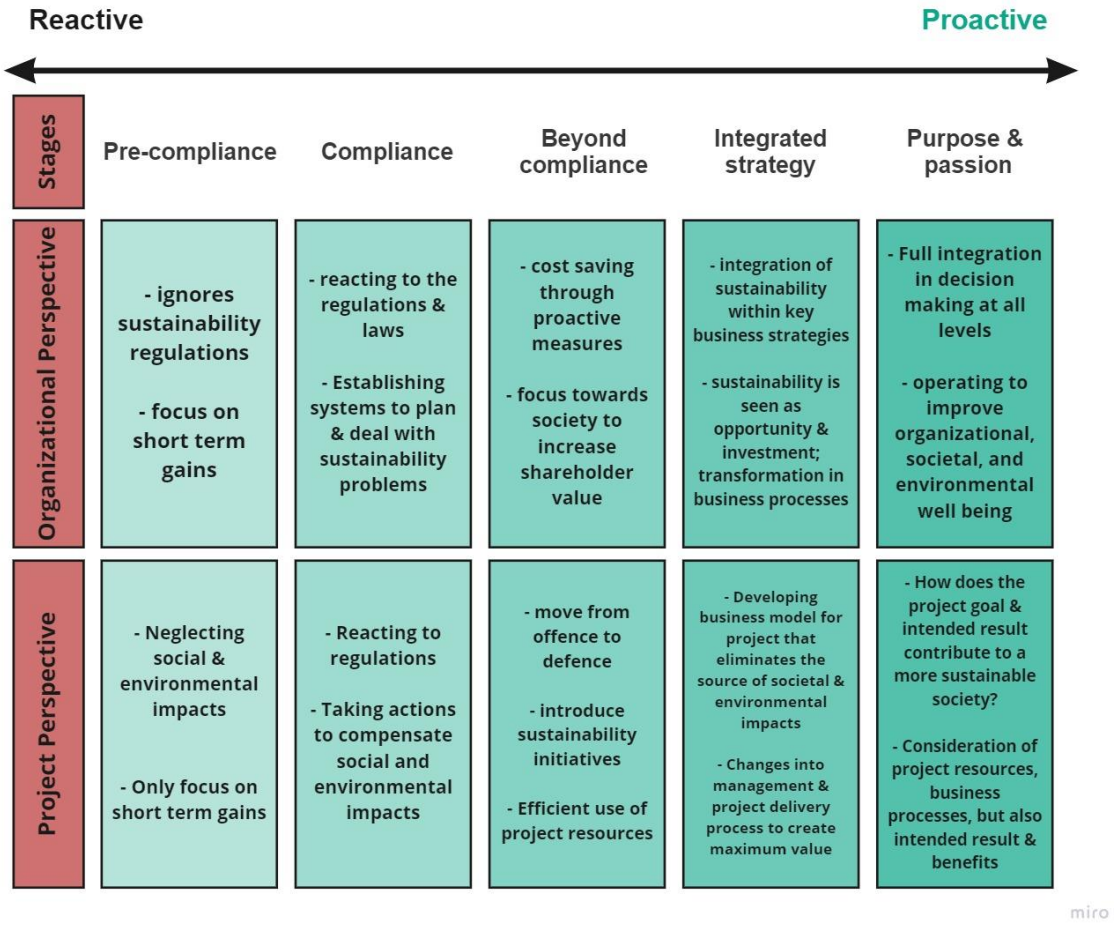

Figure 2-11: Theoretical model from reactive to proactive levels of sustainability (own illustration based on: Willard, 2005; Machado et al., 2017; Epstein & Buhovac, 2014; Silvius et al., 2012)

This model will also aid in the operationalization of elements such as stakeholder engagement and balancing the triple bottom line dimensions. This model suggests that a more proactive approach in an organization leads to a higher level of implementing sustainable solutions.

The five elements listed above can be deemed crucial for implementing sustainability strategies. To limit these elements, the application of these elements in practice, in the context of an EPC company operating in the process industry, must be investigated and assessed. This can be accomplished by making the elements operational. The section that follows elaborates on the concept and method of operationalization.

2.3 Operationalization

In section 2.2, five different conceptual elements for implementation of sustainability strategies at the strategic and operational level are described. These elements are key for organizations like EPC contractors to move from reactive to proactive implementation of sustainability strategies. To assess the application of these element in the EPC company's strategic and operational level there is a need to operationalize these elements. The process of converting ideas into measurable observations is known as operationalization (Verschuren et al., 2010). According to Allen (2017), operationalization is the process by which a researcher outlines how a concept is measured, observed, or altered within a specific study. The theoretical and conceptual variables of interest are turned into a collection of exact operations or procedures that specify the variable's meaning in a specific study through this process (Allen, 2017).

The operationalization process begins with the selection of distinct indicators that will be utilized to represent the ideas that we are interested in exploring (DeCarlo, 2018). There are three major operationalization milestones (Bhandari, 2022): 1. determining the core concept, 2. selecting a variable to represent each concept, and 3. selecting an indicator for each variable Indicators are variables that can be observed and/or measured. Individual well-being, for example, can be quantified using indicators such as physical health and mental health. After selecting the indicators, the final stage is to determine how the values of these indicators can be observed (Verschuren et al., 2010). This can be accomplished by creating a set of instruments. The collection of instruments in qualitative research, such as this thesis, can include open-ended questions with no predetermined answer (Verschuren et al., 2010). It could also include other themes that could be used in an in-depth interview.

As your concepts progress through the ideation, conceptualization, and operationalization processes, they get more specific (DeCarlo, 2018). The study process begins with a general curiosity, followed by the identification of a few essential topics, their definition, and the precise measuring methods (index and scale). The factors examined in section 2.2 are operationalized in this study to see how these concepts are observed in practice. Because the study is qualitative, open-ended questions are used to operationalize the aspects. To examine if project requirements fit with TBL aspects in practice, for example, questions beginning with terms such as 'to what extent...' are used. Furthermore, the model described in section 2.2.5 is utilized to measure the EPC company's level of proactiveness on a corporate and project level. This will aid in the future development of the framework for proactive sustainability integration in projects.

For this research, the following elements are, and their definition as described in section 2.2 are used for operationalization- 1. Organizational decision-making, 2. Lifecycle thinking, 3. Stakeholder engagement, 4. The balancing of TBL aspects, and 5. Proactive approach towards sustainability. In order to delineate these elements in practice, the consideration of these elements will be investigated through document review (chapter 3); this will be done by reviewing relevant documents, guidelines, and practices used by the EPC company. The elements will then be operationalized further by conducting semi-structured interviews with company employees. In the interviews, these elements are regarded as a central theme.

2.4 Conclusion and Next Steps

The aim of the literature review was to provide theoretical insights into the concept of sustainability and elements that organizations should consider for implementing sustainability strategies answering the SQ1.

The theoretical background defines the concept of sustainability focusing on the triple bottom line principle i.e., social, economic, and environmental dimensions. The three pillars of sustainability form a concrete foundation for EPC contractors to operationalize sustainability in their practices. The importance of TBL principle within this research is explained in section 2.1.1. This is followed by contextualizing sustainability from a corporate organization viewpoint. Additionally, the role of sustainability in the process industry is explored followed by delineating the conditions for EPC contractor to implement sustainability and the identification of barriers to sustainability implementation.

To answer the SQ1, the chapter highlights the elements that should be considered by an organization while implementing sustainability strategies. These elements have shown to be involved in different levels of decision-making within an organization. The extraction of relevant literature to study the different elements is provided in appendix A. Based on the literature reviewed, a distinction is made between strategic, tactical, and operational level along with structuring sustainability within these levels. At strategic level, the top management decides the strategies regarding sustainability that supports business advantage and focus on long term performance. These strategies are converted into suitable plans and guidelines and are implemented at the operational level. The operational level is critical in implementing the sustainability strategies on projects and thus the responsibility lies on the project managers to realize not only the project goals but also the organizational goals.

Additionally, the literature shows consideration of life cycle thinking, need for stakeholder engagement, balancing the social, economic, and environmental implications, and a change from reactive to proactive approach towards sustainability is required for an organization. The importance of these elements for an EPC contractor has been highlighted. A life cycle thinking approach is beneficial for EPC contractors as they have control over the whole life cycle of project, allowing them to implement sustainability strategies to realize their own strategic goals and meet client requirements. It is important for EPC contractors to control the impact of their operations on the social and environmental dimension by making efficient trade-offs to minimize the impact. The inclusion of sustainability and the need for balancing social, economic, and environmental impacts is likely to increase the number of stakeholders involved in the project. For implementing sustainability, the level of influence companies have over its internal structure, systems, and people is more compared to influence over the external factors like client requirements or market. This poses an additional challenge in implementing sustainability as the clients are in the driving seat in setting project goals and objectives. This results in a need to be proactive in implementing sustainability within the organization but also in engaging clients towards realizing projects in a sustainable way. Most importantly, to achieve the desired level of sustainability performance a change is required not only on an organizational level but also on an individual level. The desired level of proactivity can only be achieved when the organization and its people successfully embrace the change/shift towards balancing social, environmental, and economic aspects in daily operations and decision-making. Figure 2.11 illustrates the different levels in moving from reactive to proactive.

It can be concluded that for an organization to integrate sustainability at the strategic and operational level consideration of these elements is a must. However, the Brundtland report provides a commonly used starting point for defining sustainability but offers no guidance for defining and operationalizing

sustainability practices. Also, it is unknown how these elements are reflected in practice specifically within the EPC company. This necessitates the need to operationalize the elements to assess it use in practice. Section 2.3 defined the concept and process of operationalizing the elements providing a foundation for further investigating the level of integration of the EPC company with these elements at the strategic and operational levels.

The next chapter reviews the sustainability strategies of the case company, the guidelines/plans developed for sustainability implementation and compare the strategic goals to the objective at project level. This is followed by developing indicators per element to be further tested through semi-structured interviews.

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CHAPTER 3: DOCUMENT REVIEW

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CHAPTER 3: DOCUMENT REVIEW

This chapter presents the results of the document review. The outcome of this chapter showcases the comparison between the strategic and operational level with respect to sustainability implementation, answering SQ2:

SQ2: How do the company's strategic goals for sustainability relate to the objectives at the project level?

This chapter elaborates on the sustainability strategy of Fluor, by reviewing internal/external company documents. The section (3.1) describes the company's strategic goals and vision. Section (3.2) presents the documents that were reviewed in the process. More details about the document reviewing process can be found in, appendix B. Section (3.3 and 3.4) focuses on Fluor's sustainability goals and current progress at the strategic and operational level respectively. Furthermore, the section (3.5) compares the goals at strategic level to objectives at operational level in relation to the elements presented in chapter 2 and highlights the implications that contribute to the implementation gap (described in problem statement). Section (3.6) further expands the concept of operationalization by presenting the indicators to be analyzed later through interviews. Lastly, section (3.7) provides the chapter conclusion and next steps.

3.1 Fluor's Strategic Goals, Vision & Purpose

As mentioned in section 1.3, Fluor is a global engineering & construction company providing professional and technical solutions to deliver safe, well-executed, capital efficient engineering, procurement, and construction (EPC) projects to clients around the world. The company's vision is *"to deliver innovative and sustainable solutions that will enable the stakeholders to flourish"*. To create value for its stakeholders, Fluor has four strategic priorities (Fluor, 2021):

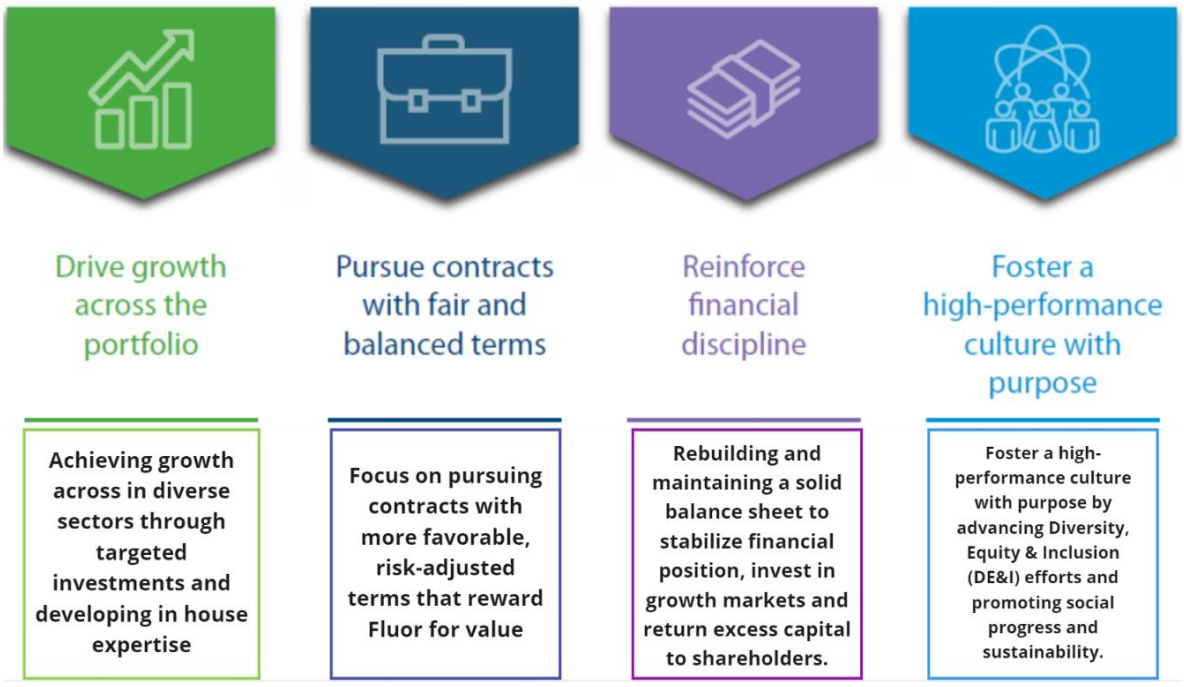

Figure 3-1: Fluor's Strategic Priorities (retrieved from: Fluor, 2021)

According to Fluor (2021), the current sustainability focus includes making progress on UN SDGs related to communities, health & safety, supply chain, environment, energy transition, and diversity, equity & inclusion. Fluor is committed to eliminating scope 1 and scope 2 absolute GHG emissions by the end of 2023 for their facilities i.e., offices. This is done by reducing energy consumption through cost effective operations, using, or purchasing clean energy, and purchasing renewable energy attributes such as solar panels. To accelerate sustainability Fluor is investing in sustainable innovation and partnership with independent & governmental organizations such as Institute for sustainable infrastructure (ISI), U.S. Green Building Council (USGBC), Carbontech leadership council etc. Since 2008, Fluor has reported on sustainability progress to better manage environmental and social performance.

Fluor's corporate level is in charge of defining the company's plans, goals, and objectives. Plans, guidelines, and procedures are developed at the corporate level and implemented throughout the organization. These standards and procedures are intended to be applied in various offices and on a project-by-project basis. The projects are aligned with the strategic level objectives, and the performance is reported back to the corporate level.

Although the literature review describes the function of the tactical level in organizations, in this study, the corporate sustainability committee develops sustainable practices and guidelines, which are subsequently cascaded down to be employed on projects. The reporting on these guidelines is done via office management to the corporate management. As a result, the engagement of strategic and operational levels is highlighted. As indicated in the literature review, one of the issues that organizations encounter is translating high-level strategy into tangible action on projects. As a result, these two levels are taken into account in further analysis of the research problem.

3.2 Document Review

The transition of sustainability from strategic level to operational level is dependent on several aspects. According to Engert and Baumgartner (2016), the implementation process receives less attention in comparison to its strategic formulation. Engert and Baumgartner studied the gap between formulation of sustainability strategy and its implementation and reported both internal (organization structure, processes, communication, knowledge, management control) and external (willingness, industry nature) aspects influencing the integration process. Through the document review, the company's internal processes will be studied to assess the development towards sustainability, understanding of people. And implementation of sustainability strategies.

As stated in the previous section, to understand the company's sustainability strategies, goals and progress at corporate level and project level, document review was conducted. The annual reports of the company are a valid starting point for this document review. However, the annual report presents the global progress and not the individual office progress. These documents are publicly available and can be downloaded without any restrictions. Along with the reports other documents like sustainability policy, data report, and quarterly progress report have also been included in the review.

To analyze the progress at project level, access to internal documents on project level was provided by Fluor. These documents can be accessed via the company's internal portal and therefore are not accessible to non-employees. These documents include the plans, guidelines, and processes developed for use at project level. Apart from documents related to sustainability, general documents such as project management process, manual, and organizational charts were also reviewed. To see how the elements identified in the literature reflect in practice, company documents addressing these aspects were reviewed. This was done to understand

the existing processes and how the strategic direction in terms of sustainability is carried out in the projects. The table below presents the documents that were reviewed. The details of the documents, like, its use or what the documents is, can be found in the appendix B.

Table 3-1: Documents studied in the review

External Documents	
Name of the document	**Category**
Sustainability Report	2020 and 2021 annual sustainability reports
Fluor Sustainability Policy	Company Policy
Sustainability report- Data Disclosure	GRI Rating
Net Zero 2023 Progress Report	Progress report
Sustainability Progress at Glance	2021 progress
Internal Documents	
Name of the document	**Category**
Sustainability Guidelines	Corporate guidelines
Sustainability Workshop	Value improving workshop for projects
Sustainability Resources at Fluor	Resources available within the company
Sustainability Proposal Write-up	Project proposal document
Sustainability Activities on Project	Project practice
Project Management Manual	Standard project practice
Standard Project Procedure Manual	Standard project practice
Client Alignment Process	Standard project practice
Operating System Requirements	Standard project practice
Sustainability Performance Tool (SPIMS)	Sustainability tool
Sustainability action and screening tool	Sustainability tool
Sustainability Awareness Survey	Amsterdam office survey
Project Sustainability Goals	Sustainability Blog
Eco Squad	Sustainability Blog

3.3 Sustainability at Corporate and Office Level

The main business of Fluor is providing EPC services for projects around the world and are currently operating in three different business line: Energy solutions, Urban solutions, and Mission solutions. For this research, the focus is on the Energy solution business line and projects under it. The main aim is to conduct business that meets the needs of clients and stakeholders, while balancing social, environmental, and economic aspects to meet the needs of tomorrow. In terms of the corporate strategy, in the annual sustainability report the current progress and approach for coming years is formulated. The corporate strategy is for the company's overall performance, but there are also office-specific goals and practices set for each office, like forming an office sustainability team. The strategic targets are accelerating environmental stewardship, accelerating social responsibility, energy transition, and helping clients meet their sustainability goals. These strategic directions include the following:

- **Net Zero 2023:** the scope includes reducing emissions produced within offices, vehicles at those offices, and business travel. This is done to manage operations in an environmentally responsible manner. Additionally, it also includes reducing waste, water consumption, and reducing emission within the supply chain. Since 2020, the GHG emissions were reduced by 15% and indirect energy use by 2.4 million kilowatt-hours. Figure below shows scope 1, 2, and 3 GHG emissions since 2019.

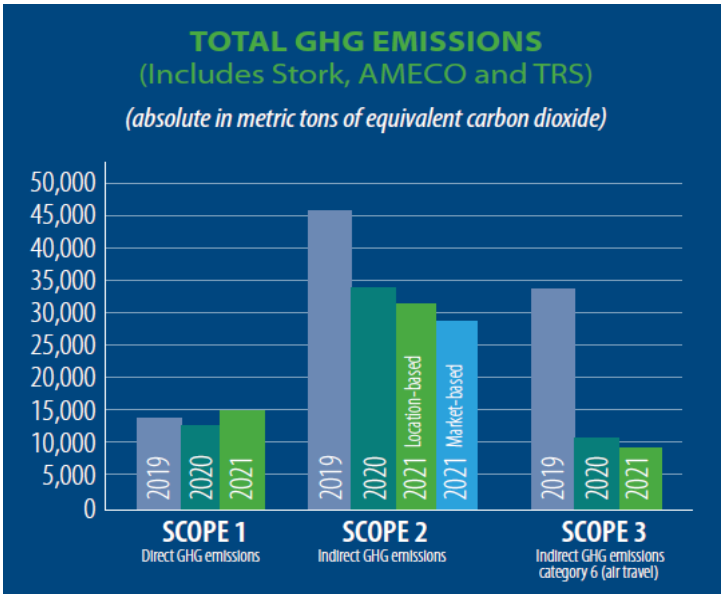

Figure 3-2: Fluor's total GHG emissions (Retrieved from: Fluor, 2021)

- **Social Responsibility:** Fluor is committed in contributing to society and the communities surrounding the project that it builds. The initiatives undertaken are aligned with the UN SDGs. The focus areas include reducing hunger, poverty, and providing quality education and healthcare through donations. Internally, improvements are made towards leadership by focusing more on diversity, equity & inclusion, and health & safety programs. It has also initiated several programs for the development and betterment of employees and the society.

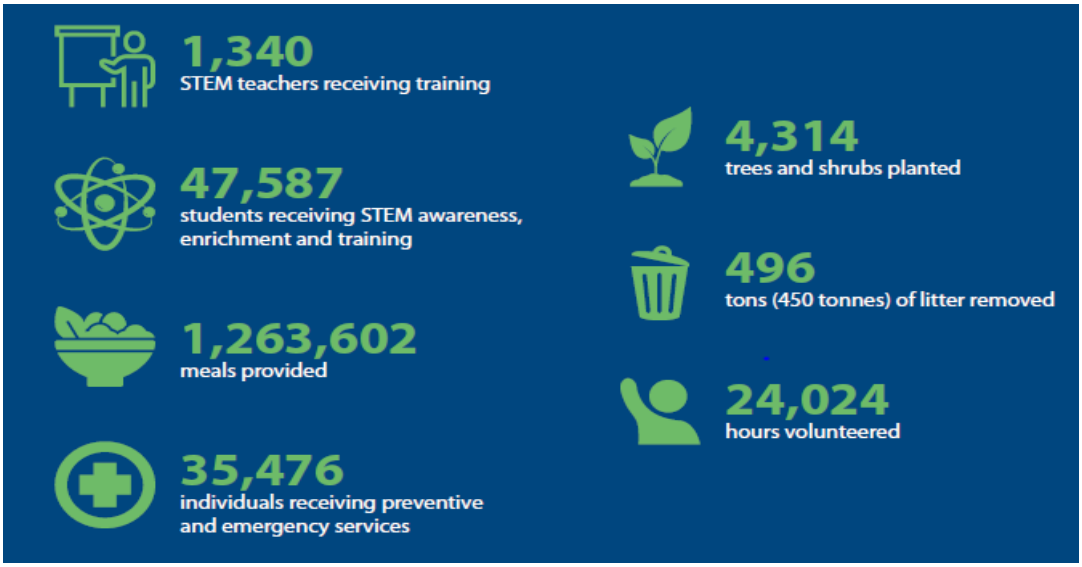

Figure 3-3: Numbers from community & social service (retrieved from: Fluor, 2021)

- **Energy Transition:** Fluor's role in the energy transition is to safely and sustainably design, build and maintain projects that create a better world. Providing expertise to help clients navigate their decarbonization and sustainability journey. Additionally, the focus is also on advising clients on carbon reduction approaches. Proactively partnering with institutes & organizations like Carbontech leadership council, ISI, USGBC to progress the sustainability goals.

Figure 3-4: Progressing towards UN SDG: 7 and 13 (Retrieved from: Fluor, 2021)

- **Sustainability Reporting:** Fluor has been reporting economic, environmental, and social sustainability initiatives through Global Reporting Initiative (GRI) standards. The standards enable organizations to report the impacts of their activities along the economic, social, environmental, and Governance dimension (Global Reporting, 2021). The information made available through this allows internal and external stakeholders of Fluor to form opinions and make informed decisions about Fluor's contribution towards sustainable development. Furthermore, to report on the facilities, i.e., office activities, SPIMS tools is being used. It is used for measuring the energy usage, waste usage, carbon footprint, and measuring emission within the corporate boundary.

This transition to company-wide sustainability is dependent on management commitment, client collaboration, and employee engagement. A credible top-down commitment and management structure are required to embed sustainability within different levels of the organization as well as the culture. The company's main challenge in terms of sustainability is raising awareness and developing mindsets. Part of this challenge is to understand what sustainability means in the big picture as well as what it means in the day-to-day. Fluor formed a corporate sustainability committee comprised of people from various levels of the company's management in response to this challenge.

The sustainability support team is part of the overall corporate development organization structure and is in charge of developing strategies and practices. The team is responsible for the implementation of the strategies and practices. The office management is in charge of developing sustainability goals for the office and implementing practices on projects. This is accomplished by establishing an office sustainability team, which oversees developing strategies, guiding different business lines, and spreading sustainability awareness. This research is carried out for Fluor's Amsterdam office; hence it focuses on the strategies developed for Amsterdam office including the official corporate procedures. For example, the sustainability proposal write up is developed by the sustainability team to initiate discussions with the client regarding sustainability in the proposal phase of the projects.

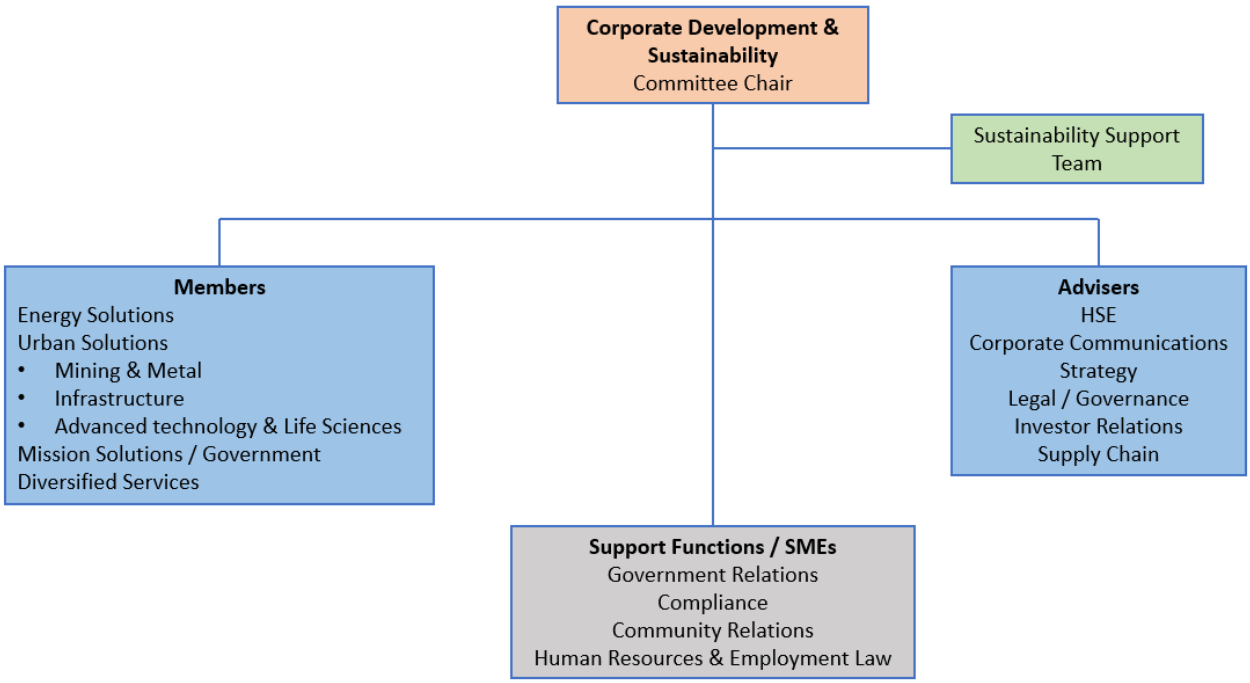

Figure 3-5: Corporate development & sustainability organization chart (retrieved from internal document)

At the strategic level (corporate and office) multiple initiative with respect to sustainability are taken and there is a proactive drive towards achieving the sustainability goals. It includes reduction in consumption of electricity, reducing waste, reducing carbon emissions from travel, creating awareness among the people. In comparison to the elements identified in the literature review, a balance between the TBL dimensions is achieved. Referring back to figure 2.9 (section 2.2.4), revenues are generated by acquiring new projects, environmental impact assessment is carried out, 70% of waste is recycled, 29% less consumption of electricity, more jobs are created, and 4 awareness workshops are carried out. On the level of proactiveness (referring to figure 2.11, section 2.2.5) from an organizational perspective Fluor currently stands in the level-beyond compliance. However, the level of proactiveness is not the same at the operational (project) level and needs to be further investigated through interaction with project managers. Although guidelines, workshops, and practices are developed for the projects the challenge that company faces is implementing those in the projects. The awareness workshop conducted shows that there is a need to improve the communication regarding the goals and strategies, improving KPIs used for measuring progress, more commitment from top management, and creating more awareness. Almost 15% of people are unaware about the sustainability goals to be achieved. Additionally, through literature, lack of commitment from the employees towards sustainability initiatives has been found as trigger for sustainability implementation (Epstein & Buhovac, 2014; Engert & Baumgartner, 2016; Peenstra & Silvius, 2018) which is also reflected in practice as concluded by reviewing the awareness survey document. One of the reasons behind this is lack of communication regarding the sustainability goals leading to lack of clarity among the employees. Overall improvements are needed regarding aspects such as communication, awareness, clarity, and commitment for corporate sustainability objectives.

The following section focuses on the project level. This level represents the system in which the corporate and office level sustainability goals are realized in practice.

3.4 Sustainability at Project Level

To see how the sustainability goals, practices, and guidelines are applied in practice a closer look at project level is required. To gain better understanding of sustainability strategy at project level, internal documents (see section 4.2) containing information related to projects were reviewed. The documents reviewed gave a detailed overview of the current practices and guidelines applied on the projects in different phases. The purpose of these sustainability practices is to be used globally on projects to provide environmental, economic, and social benefits to Fluor and its clients. The following practices are designed to be used on projects:

- **Sustainability Workshop:** The intent of this value improving workshop is to create achievable sustainability actions that will contribute to Fluor's project sustainability objectives. The workshop is designed to guide project managers to develop sustainability strategies for the project. It follows a four-step methodology-

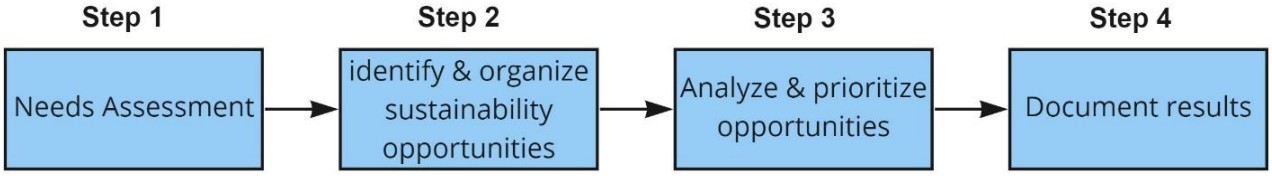

Figure 3-6: Opportunity identification methodology (retrieved from: internal document)

The first step is to identify the client's requirements, needs and the project boundaries and limitations. The second step involves identifying opportunities by different functions such as contract, operations, engineering etc. The third step is to analyze the pros and cons and finalize the potential opportunities. The last step is to document the workshop results. Documentation is important as at this stage trade-offs can be made due to changing project requirements. The initiation of this process greatly depends on the project phase, the scope, type, time constraint, project manager/team, and client's willingness to pay. This workshop is particularly important to know the urgency and willingness of clients to perform sustainability related activities on projects.

- **Sustainability Activities on Projects:** This document serves as "how-to" guide for projects that need to implement sustainability program. The guidelines follow the steps shown in figure below. This consist of firstly determining sustainability focus on projects in line with corporate sustainability policy & TBL. Secondly assigning a sustainability coordinator who is responsible for all sustainability related activities on projects. This is then followed by identifying high value sustainability actions that can be implemented on project, communicating the sustainability plan to client, developing overall budget for it, forming sustainability team, and assigning roles for monitoring performance on project, reporting on the progress and performance, and highlighting the efforts and lessons learned. The main aim of this practice is to highlight the need for addressing sustainability challenges and creating opportunities to develop innovative solutions.

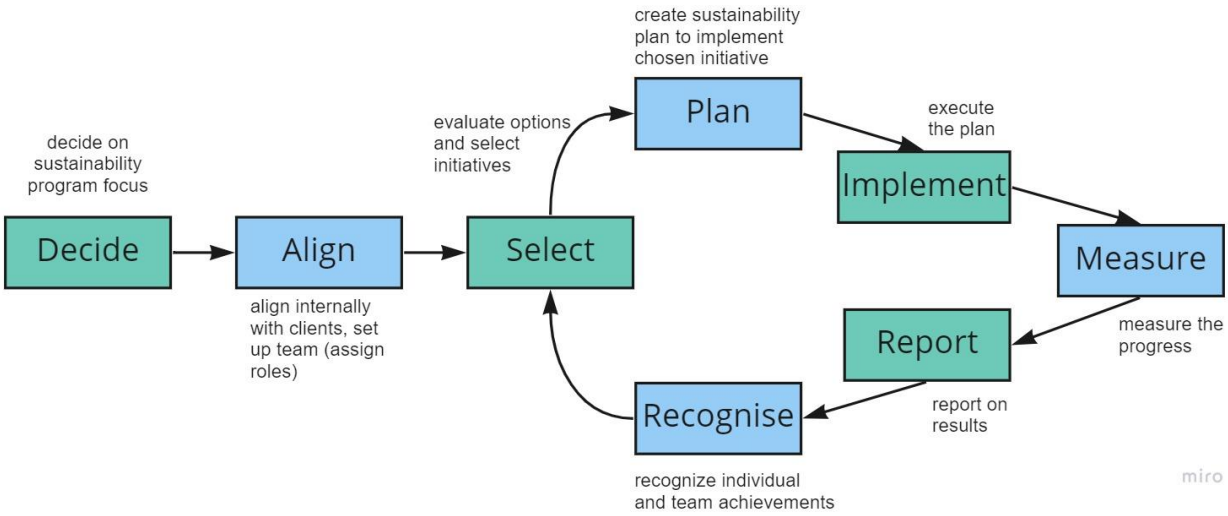

Figure 3-7: Sustainability quick start guide (retrieved from: internal document)

- **Sustainability proposal write-up:** this document is included as a part of the project proposal document. It showcases Fluor's progress and ability towards achieving sustainability ambition of clients.
- **Sustainability action and screening tool:** this tool provides a means for screening and prioritizing a pre-defined set of sustainability actions for implementation on projects. Designed to help project managers determine good fit sustainability actions for a specific project. The tool contains several actions that could be used in different project scenarios. The main sustainability aspects include energy consumption, waste generation, health and safety among others. It doesn't evaluate the environmental impact of certain construction materials and therefore conflicts with the life cycle thinking approach. Also, it cannot be used to track progress related to social impacts. The tool also has a very limited number of actions with regards to the design. The actions include the regulatory compliance that is generally followed in practice.

Although the practices include appointing a sustainability coordinator who is in charge of the sustainability program on the projects, there is no actual evidence of this role being initiated. This role is regarded as an additional responsibility to the individual's current role. The practices can be used on the project sites during the construction but there is no implementation throughout the project life cycle. In addition, there is no documentation of the workshop or guidelines being used on projects. As projects are executed in accordance with client specifications, sustainability is regarded as a lower order priority element. To implement sustainability practices on projects, project managers need to be proactive in engaging client & project team as well as in assigning specific roles and responsibilities as early as possible in the projects. The figure below shows a typical project organization chart. The position of sustainability coordinator is not an official position since it is an additional responsibility that is assigned project by project, hence it is highlighted in red.

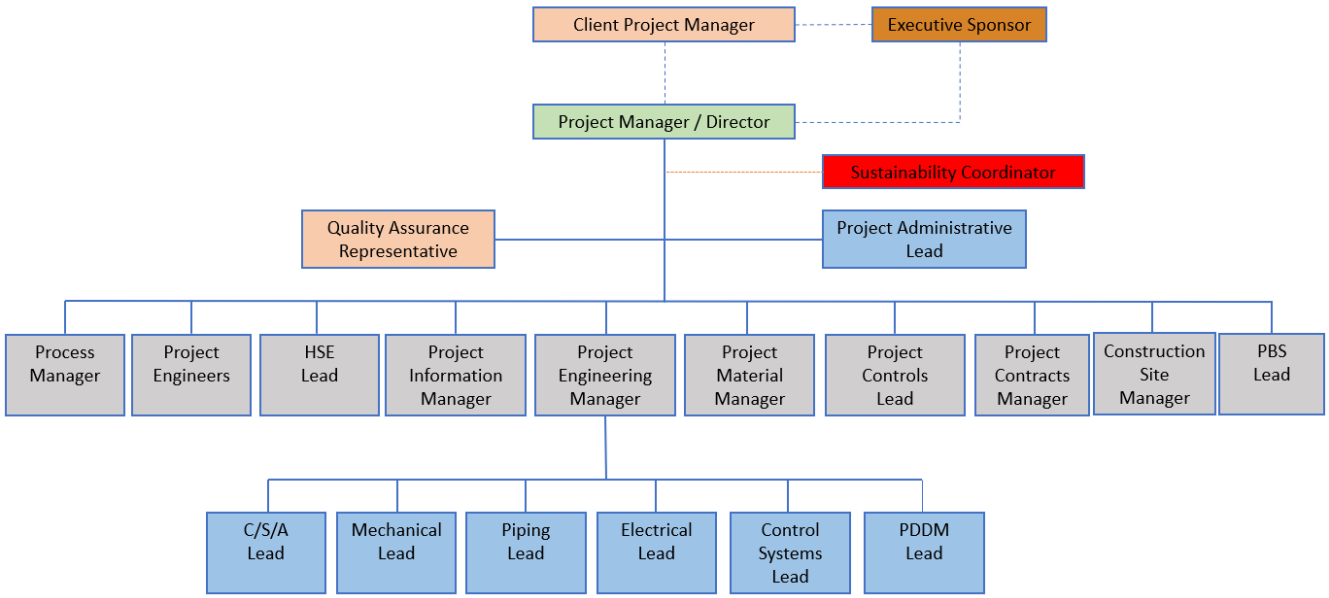

Figure 3-8: Typical Fluor project organization chart (retrieved from: internal documents)

As mentioned earlier, efforts for implementing sustainability at project are taken in the form of development of guidelines, practices, and tools. However, not all the practices are being fully realized on the project level. One of the reasons being that there is no reporting or measurement system. For example, the SPIMS tools is currently being used only to measure sustainability performance of the offices and the assigning a sustainability coordinator is challenging as it necessitates full fledge commitment in addition to the existing role of the individual. The sustainability workshop is developed to create achievable sustainability improving actions that will contribute to Fluor's strategic and project's sustainability objectives. However, these guidelines are not yet an official corporate procedure, hence are not being used at the project level by the managers. More emphasis is being given to the traditional constraints including the safety aspects in the client alignment process. Sustainability is still regarded as secondary, with projects reacting only to the necessary regulations.

In terms of awareness regarding sustainability, the projects are driven by clients resulting in a lesser degree of influence over implementation of sustainability objectives. The benefits of implementing these practices are unknown and there is a need to increase awareness regarding sustainability. Some practices are being employed in some projects but how to measure, assess, and improve is still indeterminate. According to the sustainability survey, there is already a difference in average sustainability performance at the organizational and project level. [redacted]

[redacted]

Figure 3-9: Result of sustainability awareness survey (Retrieved from: internal document)

In terms of the elements from the literature review, because sustainability is not yet a project driver, the environmental and social dimensions are not yet considered in the decision-making process. There is only compliance towards the environmental aspects like waste reduction or energy consumption. The level of proactiveness at the project level is still in the pre-compliance or compliance category. More proactive engagement with the clients is required in the form of workshops, discussions, knowledge exchange session to be able to realize the implementation of sustainability objectives on projects. However, the challenge for the company is whether this 'pushing' of sustainability in the project is appreciated by the client and pays off.

3.5 Comparing the Strategic and Operational Level

The table below compares the strategic and operational levels in terms of the elements listed in the literature. Organizations are finding it more difficult to reap the full benefits of sustainability as its importance grows. The greater their emphasis on sustainability, the more it must be incorporated into the business. There are several reasons for the gap between strategic goal and its implementation. These are later emphasized in detail through semi-structured interviews.

Table 3-2: Comparison of sustainability at strategic and operational level

Elements	Strategic Level	Operational Level
Decision-making	• Driven by TBL • Depends on market condition • More control over strategic level decisions • Focus is on long term vision	• Driven by cost • Depends on project requirements • Less control over project specific decisions • Focus is on short term (operational tasks of project)
Balancing triple bottom line	• Focus on all three dimensions • More community and social engagement • Integrated strategy for environmental stewardship • Reporting on all three areas	• Economic is the main driver • Social dimension is given the least priority • Compliance with the environmental stewardship • Reporting on financial and environmental aspects like waste minimization or energy consumption.
Stakeholder engagement	• Engagement with various organizations in achieving UN SDGs • Contribution to local community • Investments towards various initiatives	• Following the client's requirements • No contribution towards local community • Depends on client's willingness to pay
Life cycle thinking	• Reporting w.r.t GRI standards • Tools and metrics to report the activities related to TBL • Life cycle cost analysis for the facilities	• Reporting on environmental aspects only during construction • No mindset for lifecycle perspective within projects

		• Design is based on compliance, nothing over and beyond SPIMS tool cannot be used for life cycle assessment
Proactive approach	• Stage 3 and 4- beyond compliance and integrated strategy • More proactive engagement towards sustainability • Development of goals and practices • Reporting to the corporate level	• Stage 1 and 2- pre-compliance or compliance • Reactive approach towards sustainability • Not all practices are realized • No reporting for projects

3.6 Indicators for operationalizing the Elements

As stated in Chapter 2, Section 2.3, open-ended questions can be used to operationalize concepts in a qualitative study. To analyze the integration of these elements in practice indicators in form of statements are developed. These statements are then converted into open ended questions (appendix C) for conducting the interviews. The definitions and the importance of the elements is described in the literature review. This also helped in identifying documents to be reviewed, which presented the current progress and practices used by Fluor towards sustainability implementation. The literature review highlighted the importance of balancing the triple bottom line, stakeholder engagement, proactive approach, life cycle thinking, and organizational decision-making as important elements for integrating sustainability. A comparison of Fluor's strategy at the strategic and operational levels was done based on the document review. This was accomplished through researching key sustainability-related documents. The documents provided a detailed overview of the practices, initiatives, and methodologies that are being developed for use on projects. This also provided an outline of the application of elements in developing the strategies. According to the literature, integrating sustainability requires a shift from monitoring time, cost, and quality and toward managing social, economic, and environmental impacts. To examine how this reflects in practice, indicators such as 'primary driver of project', 'social, economic, environmental trade-offs', 'use of TBL in decision-making' and 'assessing project performance' were developed. Following indicators per element are formed to better investigate its application in practice. The indications are in the form of statements and are also specific to the company's use of practices. The indicators are developed considering the outcome of table 3.2. For example, with respect to proactive approach, table 3.2 shows that there is a reactive approach towards sustainability in projects and it is within pre-compliance and compliance. Considering this the indicators, approach at operational level to sustainability and level of proactiveness from project perspective are developed. This will not only reflect the findings of the document and literature study but will also allow for further investigation into the rationale behind the approach taken on projects. Furthermore, aspects such as driven by cost or short-term focus relates more as barriers to sustainability integration and are therefore considered in identification of barriers in the semi-structured interviews.

Table 3-3: Elements and Indicators used for operationalizing

Elements	Indicators
Organizational decision-making	Sustainability decision-making at strategic and operational level
	Corporate sustainability strategy in project goal formulation
	Responsibility of decision-making
	Level of influence on decisions regarding sustainability
Balancing the triple bottom line	Social, environmental, and economic trade-offs
	Primary driver on projects
	Use of TBL criteria in assessing project performance
	Level of involvement in strategic and operational decision-making
Stakeholder engagement	Discussion regarding sustainability in client alignment meeting
	Value improving workshop with client
	Impact of client requirements on project sustainability
	Influence of Fluor over clients
Life cycle thinking	Sustainability throughout the project lifecycle
	Tools and methods for management of resources
	Metrics and plans to monitor sustainability performance
	Use of screening tool for project sustainability reporting
Proactive approach	Approach at operational level to sustainability
	Level of proactiveness from organizational perspective
	Level of proactiveness from project perspective
	Difference in strategic and operational level proactivity

The following statements were translated into open-ended questions that were asked in semi-structured interviews to determine how the organization is addressing sustainability at the strategic and operational levels. To reach a conclusion, the answers to these questions were recorded and labelled into codes. The outcome of these indicators is reported in the next chapter.

3.7 Conclusion and Next Steps

The aim of document review was to study the company's strategic and project (operational) level efforts towards sustainability. This was done to understand the attributes of the case company, their practices and their context in the research study.

In order to do so, several documents were reviewed that contained information about the organizational strategic goals, processes at operational level, performance, guidelines, and practices. This document review was carried out in order to understand how the strategic goals relate to the project objectives. The search of documents was done through the company's database. The research focuses on sustainability at operational level, hence the documents related to sustainability and project procedures were reviewed. The details about the process followed and documents reviewed can be found in appendix B. After studying the relevant documents, a comparison was made between the two levels. It was concluded that Fluor's performance at the strategic (organizational) level is driven by the principle of triple bottom line whereas on the operational (project) level economic dimension is the main factor. The company is proactive in reporting their offices' sustainability performance by implementing various measures, but reactive when it comes to implementing sustainability at the project level. The company have also established a sustainability committee at both the corporate and individual office levels. These committees are in charge of organizational and project-level sustainability action. Several project-specific guidelines and processes have been developed. However, little

evidence has been found of the implementation of these guidelines on projects. These guidelines and processes are recommended for use on behalf of the client. It is critical to demonstrate the economic benefits of these actions to the clients. Setting goals, guidelines, and processes will not produce the desired results; rather, proactively implementing these will aid in the realization of the project's sustainability objectives. The documents examined also emphasized the incorporation of social, environmental, and economic dimensions into organizational processes and strategic goals. The level of integration is above and beyond at the strategic level but is compliance at the operational level.

The documents also highlighted the need to improve the communication of these strategies and increase awareness among the people. The consideration of these soft parameters is critical in driving the changes towards sustainability. Sustainability is not yet a project driver for the case company as no data was found with regards to implementation of sustainability. Although the tools like screening tools and workshops provide an opportunity to identify project specific actions the implementation is not yet mandatory on projects, it's all voluntary. This approach will restrict the attention towards sustainability and it will be considered least important. The document review showcases that there exist a gap between strategic and operational level.

Additionally, the literature and document review resulted in development of indicators for the elements identified in chapter 2. These indicators are used for operationalizing the elements i.e., to see their use in practice and within the case company. The indicators are developed in the form of statements which are later converted into open-ended questions to be used in the interviews. In total 20 indicators have been developed.

Based on the review of the documents, it is possible to conclude that there is a misalignment when it comes to achieving the sustainability objectives at the operational (project) level. There is a need to investigate the barriers that influence the implementation of sustainability, as well as the consideration of the elements in practice. The set of indicators created will aid in analyzing the level of integration with the various elements. It is critical to investigate the reasons for the observed gap between these levels through appropriate empirical research. It is necessary to gain a more detailed understanding and exploration of the barriers influencing the implementation of sustainability. The next chapter describes the research methodology adopted for this research and presents the results of the empirical research.

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CHAPTER 4: SEMI-STRUCTURED INTERVIEW

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CHAPTER 4: SEMI-STRUCTURED INTERVIEWS

The goal of this chapter is to gain practical insights into implementation of sustainability at operational level. This is done by semi-structured interviews. This chapter focuses on the semi-structured interviews as a data gathering methodology and analysis of empirical data for the research. The chapter answers the SQ3:

SQ3: What barriers contribute to the gap between strategic goals and its implementation at the operational level?

The chapter is structured as follows: Section (4.1) describes the data gathering process for this study. Section (4.2) describes the steps taken to select the participants for the semi-structured interviews. Section (4.3) further elaborates the process of interview and section (4.4) on data analysis. Section (4.5) presents the results from the interview with respect to the indicators developed in section (3.6). Section (4.6) presents the barriers to sustainability implementation and further delineates the perspective of people at top management and project managers. Section (4.7) highlights the enablers to sustainability implementation. Lastly, section (4.8) provides a conclusion and describes the next steps.

4.1 Data Gathering

The goal of this phase is to gain practical understanding about the research topic. The document review did not present the barriers influencing sustainability implementation, nor did it provide insights into the implementation of sustainability strategies in practice, from the perspective of project managers. As a result, semi-structured interviews were chosen as a method of data collection in order to identify barriers to sustainability implementation and to investigate how implementation strategies are addressed in practice.

Adams (2015) claims that conducting semi-structured interviews provides opportunity to ask follow-up questions to each open-ended topic. They also allow for the discussion of new topics that may develop during the conversation, enabling exploration of new paths which were not considered earlier (Saunders et al., 2009). The purpose of the interviews is to investigate the challenges that an EPC contractor faces in integrating sustainability at operational level. It is unknown what causes the observed gap within the company and what complexities project managers face while integrating sustainability. The interviews also helps delineate the gap between strategy formulation and its implementation at operational level. To obtain the intended data, interviews were conducted with people working at both the strategic (top management) and operational (project managers) level. This provided perspectives on sustainability strategy at both levels. This will also provide information on certain topics from the perspective of interviewees, allowing for comparison of responses to that topic (Saunders et al., 2009). Furthermore, project-specific documents were analyzed to assess how sustainability initiatives were implemented. The data collection process includes setting limits for the study through sampling, collecting information through semi-structured interviews, documents, and defining the protocol for recording information.

4.2 Selection of Participants

The following criteria was chosen to select participants for the semi-structured interviews. Table 4.1 presents the profile of the participants.

- The purpose of the interviews was to identify the challenges faced in implementation of sustainability at the operational level and to delineate the gap between strategic level and operational level. Considering

this purpose, it was decided to recruit people from the project management group, office sustainability team, and from the leadership/top management.

- These three groups collectively number more than 50 people. Since it's small-scale research and had to be completed within a short period of time, it was not possible to interview everyone. As a result, a selection criterion was developed to recruit people for the study (next point).
- The participants were selected based on their role, responsibility, experience, knowledge regarding the topic, and level of influence within the department.
- Project managers/directors who are usually involved since the beginning (proposal phase) of the project and have more than 20 years of experience in realizing large-scale EPC projects were selected. A total of 8 project managers were chosen, each of whom is in charge of a different project. These people were categorized as people working at operational level. The reason behind selecting project manager was that these individuals are involved from the start, initiating discussions with clients, have a lot of influence within the project team and project decisions, have extensive knowledge of managing large-scale projects and understand the importance of sustainability.
- For the second category, i.e., top management, functional leads, office leads, sustainability team lead, and people from corporate sustainability committee were selected. These individuals have a significant role in the development of strategies, guidelines, and practices. The functional leads are also in charge of reviewing each project, involved in various discussions with the client & project team and have high influence within their respective departments. In total, 5 people from the top management were selected for the interviews.
- All these individuals have extensive experience within different fields such as process engineering, engineering management, contract management, and project management. All the participants play a central role within the project and top management.
- The table below presents the list of participants selected based on the above-mentioned selection criteria.

Table 4-1: Participants selected for the interviews

Code	Role	Experience (years)	Expertise
P1	Exec. Project Director	30	Project management
P2	Project Director	35	Engineering & project management
P3	Exec. Project Director	35	Engineering & project management
P4	Project Manager	25	Project management
P5	Project Director	25	Project management
P6	Project Director	30	Engineering & project management
P7	Project Manager	28	Engineering & project management
P8	Project Manager	20	Engineering & project management
P9	General manager	35	Project management
P10	VP Project Management	25	Project management
P11	Corp. sustainability committee member	07	Sustainability & HSE
P12	VP of Operations	17	Engineering & operation management
P13	Sustainability Group chair (Global)	19	Sustainability & HSE

4.3 Interview Protocol

The interviewees were contacted by mail, and an invitation was sent out explaining the objective of the interview and requesting them to decide on an appropriate date and time for the discussion. All interviewees were informed about the goal of the study and their role in it prior to the commencement of the interviews. Procedures set by the human research ethics committee (HREC) were followed to protect data and interviewee privacy, and the interviewee was also informed about recording the meeting and generating anonymized transcripts.

At the beginning of the interview, a few general questions were asked to know the background of the interviewee. This was followed by several questions which were sub-divided into different topics studied in this research. The questions were framed to cover the topics studied in the literature, to explore its importance in practice and to identify the barriers that contribute to the gap in sustainability implementation. The purpose of the interviews was not only to answer the sub-question 3 but to also operationalize the concepts studied in the literature. The final few questions were framed to get some suggestions for overcoming the challenges that the interviewees discussed and to know requirements for sustainability implementation. Lastly, the interviewees were also asked to give some suggestions on the research topic and ways to improve it. A sample questionnaire used for the conducting the interviews can be found in appendix C.

After transcribing the interviews, the transcripts were shared with the participants to ensure that the information captured was accurate and that no false conclusions were drawn. Following confirmation, the transcripts were used for data analysis and shared with the graduation committee.

4.4 Data Analysis

The semi-structured interviews generate qualitative textual data containing quotes, narratives, and words. Atlas.ti data analysis software is used to organize the data in systematic manner. The software allows for systematic structuring of data by evaluating and coding pieces of information to determine their importance and creating links between pieces of information. Before detailing the coding process, it is important to provide the definition of code used in this study. Codes are words that represent the topics emerging from the interview transcripts in a simple and concise manner (Chametzky, 2016). These codes act as a means for converting raw data into concrete data that can then be used for analysis. The interview transcripts were uploaded in the software and the data was organized by assigning codes using open coding based. The coding process was both deductive and inductive. Deductive data analysis is a top-down method where codes are created using concepts from literature or theory, whereas inductive data analysis is a bottom-up method where the researcher reads through the data and allows the code to emerge (Bingham & Witkowsky, 2022).

The interview questions were divided into several groups as shown in appendix C. These groups act as a central theme for this research. The data was then analyzed and codes were assigned and then these codes were grouped into these themes. Figure 4.1 shows the different themes used for compiling data. The data obtained through interviews was compiled into different themes i.e., organizational decision-making, lifecycle thinking, proactive approach, project managers perspective, top management perspective, sustainability initiatives, barriers affecting the sustainability implementation, and recommendation to overcome the barriers. The coding was first done for the data obtained regarding the elements studied in literature. This was done using the indicators developed in section 3.6. This approach is deductive. The data addressing the barriers, causes for the gap between strategic and operational level, and recommendations to bridge the gap

were assigned new codes based on the interpretation of data. This approach is inductive. In total 13 interviews containing anywhere between 20-40 coding labels generated 128 main codes (deductive + inductive). The list of few codes developed in the software is shown in figure 4.2.

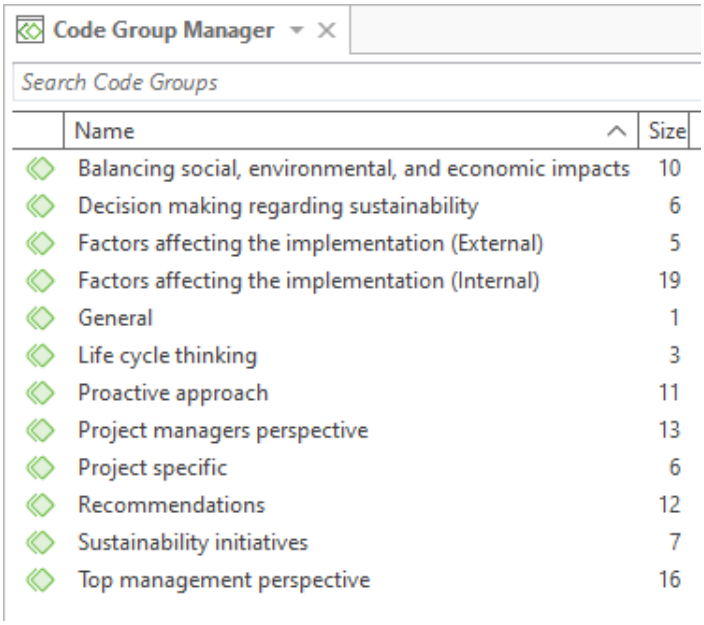

Figure 4-1: Different code groups based on the interview themes

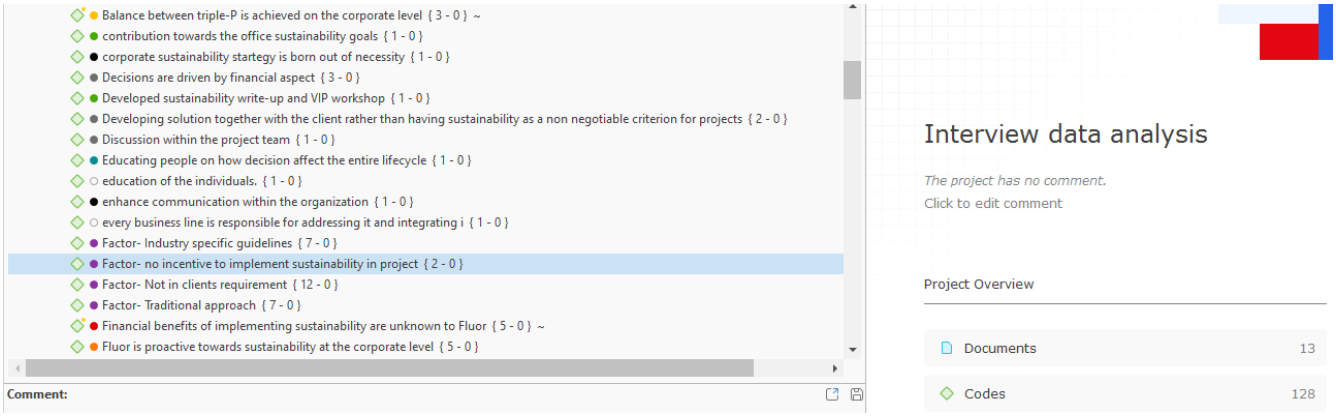

Figure 4-2: Snapshot of codes developed in Atlas.ti

For example, interviewee P4 mentioned, *"on projects the clients are not interested or there is no requirement whatsoever in terms of trying to make the facility more sustainable. My client is not really interested in the practices regarding sustainability developed by Fluor"* and was assigned a code 'factor- not in client's requirement'. This code was then placed into the group 'factors affecting the implementation (external)'. Figure 4.3 shows different codes grouped into a particular code group. Similarly, this quote by interviewee P10, *"I'm not going to break the resistance because I'm not pushing. I'm not going to tell the project managers that you need to do this and that. You can discuss it in the meetings, do marketing or positive engagement but it's the people on the project who should make a responsible decision themselves if they want to implement sustainability and not wait for the management to push it"* was coded from an inductive approach as 'it is the responsibility of project managers to implement sustainability' and then later added into the code group 'top management perspective'. Figure 4.4 illustrates the labelling of quotes from the interview

transcripts into codes. The highlighted text in the transcript is given a code: factor- not in clients requirement. Additionally, the interviewees were asked about the barriers to sustainability implementation. For example, this quote from interviewee P11, *"I think the position of top management is very loose in the sense that they don't force projects to do anything with respect sustainability. The top management will not say to projects that you have to implement the practices if client is not interested in it, there's not really a control in that sense"* was coded as 'lack of push from top management'. Hence, the quotes from different interviewees with the same meaning were labelled with the same code i.e., lack of push from top management. In this way the likelihood of occurrence of a particular barrier was identified. These steps helped in identifying patterns and solutions to answer the relevant sub-question.

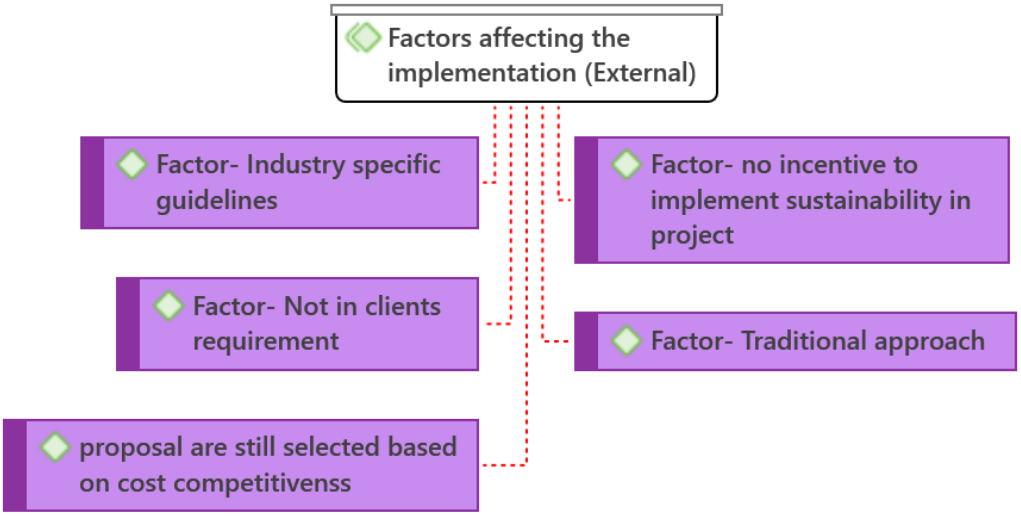

Figure 4-3: Different codes merged into one single code group

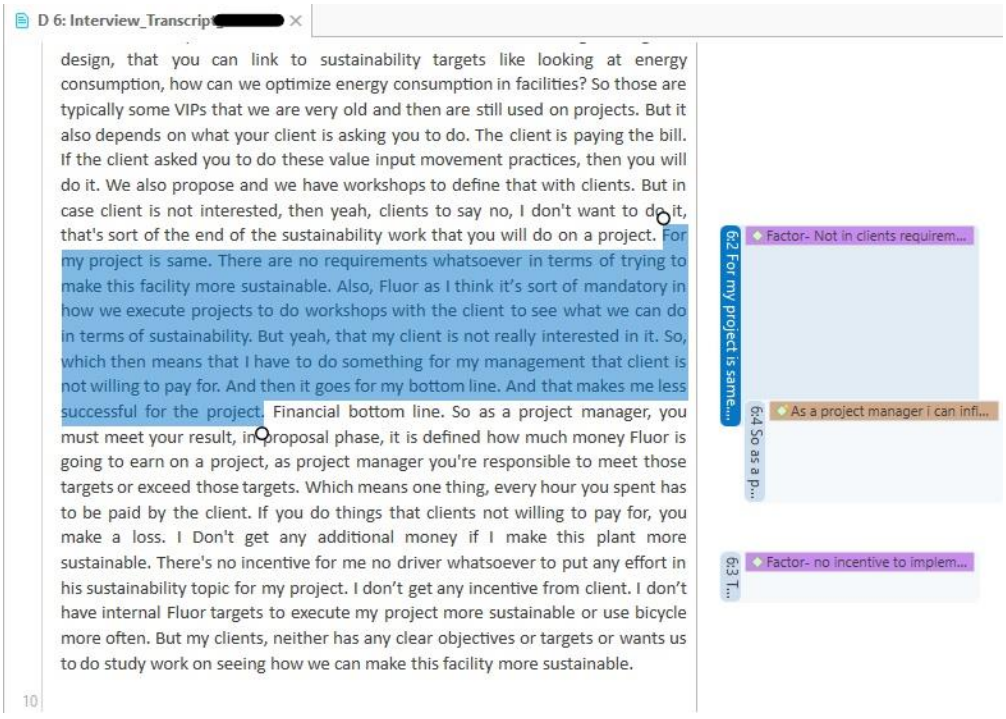

Figure 4-4: Labelling of a quote from interview transcript

4.5 Analysis of Elements in Practice

In chapter 3, section 3.6, indicators in the form of statements were developed for each element studied in the literature review. Elements, for example, are organizational decision-making, lifecycle thinking, and so on, whereas indicators are used to study the application of elements in practice. The indicators for each element are shown in the sub-sections below. This was done to further investigate the use of the elements in the EPC company in the implementation of sustainability strategies. The method is deductive because the elements were tested using indicators developed from theory. The sub-sections that follow elaborate on the findings from the interviews for each sustainability element.

4.5.1 Organizational Decision-Making

The participants in the interview were asked questions based on the indicators developed to know how sustainability is considered in decision-making at the strategic and operational level. The responses received to specific indicators were labelled and grouped into the code group 'decision making regarding sustainability'. From the interviews it was observed that there is more control over decision-making with regards to sustainability at the strategic level i.e., for the offices and facilities of the case company, compared to the operational level i.e., on projects. Interviewee P9 mentioned that *"so when it came to our offices, we implemented a sustainability program where we did everything that was possible, like, waste minimization, generating power from solar panels, going all electric etc. I also set up a committee that could brainstorm about sustainability, but the biggest gap I saw was developing something on projects. We wanted to do a lot on projects, but the decisions are driven by what our client allows us to do"*. This response was labelled as a statement 'more control over decisions at strategic level than at operational level'. All the recurring quotes with the same elucidation were given the same label. As per the literature study a more reactive approach is observed at the operational level during decision-making regarding sustainability. The same was observed from the interviews as the respondents agreed to the fact that the level of engagement at the operational level is reactive. The EPC company has less influence over the decisions to implement the sustainability strategies. Additionally, in the proposal or client alignment meeting, the top management as well as project managers are involved in deciding the project baseline. Interviewee P4 quoted, *"if the clients include things related to sustainability in the proposals, then we act upon it and discuss it, because our competitors are also doing the same. But if its not included then we do the bare minimum and there is no discussion regarding it"*. This shows that the push regarding sustainability is lacking within the EPC company and a more proactive approach is needed. The interviewees also believed that sustainability should be part of daily decision-making in order to have more influence over the client. There should be proactive discussion regarding sustainability if the EPC company wants to implement their sustainability goals and practices. The table below illustrates the responses (in form of statements) to the corresponding indicators. The interviewee responses related to the statements (column 2) are mentioned in appendix D.1.

Table 4-2: Responses to the decision-making indicators (retrieved from interview transcripts)

Indicators	Statements
Sustainability decision-making at strategic and operational level	• High level engagement at corporate (strategic) level and reactive at operational level • More control over decision at strategic level than at operational level
Corporate sustainability strategy in project goal formulation	• Not considered as projects are very much driven by clients

	• No real contribution to Fluor sustainability goals when working on projects
Responsibility of decision-making	• Client PM team and Fluor (top management and project team)
Level of influence on decisions regarding sustainability	• Drive sustainability if it benefits project bottom line • Sustainability is not part of the discussion unless clients have it in the requirements

4.5.2 Balancing Social, Economic, and Environmental Impacts

In order to operationalize this element indicators were developed to see to what extent the case company balances the triple bottom line impacts at the strategic and operational level. The responses received to the indicators were labelled and grouped into the code group 'balancing social, economic, and environmental impacts'. As described in section 2.2.4, the management of projects is dominated by the traditional triple constraint variable i.e., cost, quality, and time. In the process industry these constraints continue to outweigh sustainability. 8 out of 13 interviewees stated that the economic growth continues to remain the main driver in projects and there is only compliance with the environmental stewardship. Achieving the balance between these is driven by the client requirements. At the strategic level the EPC company comply with the aspects shown in figure 2.9, however on projects the trade-off can only be made if it provides cost advantage to the client. The policy to achieve balance between TBL constraints doesn't not reflect at the operational level. Interviewee P5 mentioned that *"if you see Fluor as an organization then yes, we are balancing that but if you relate it to the performance of project most of the times it about earnings and revenues. We try to balance these aspects, but it depends on what the requirements are"*. This quote is labelled as a statement 'balance w.r.t TBL is achieved at strategic level'. When relating this concept on projects, interviewee P4 mentioned that *"there is no requirement to assess the project with respect to the triple bottom line. We do all that is necessary and follow the regulations, we will not go over and beyond just to achieve the balance. We try to stick to the baseline"*. This quote was labelled as 'Fluor will not go over and beyond on projects unless specified by clients'. All the recurring quotes were given the same label. In conclusion, the primary focus in projects is on economic growth with compliance to environmental stewardship. The social aspect is undermined on projects. To compensate for the increasing operational impacts the EPC company is now bidding on more sustainable projects. But achieving these trade-offs is difficult if it comes with cost damage to the company. Interviewee P1 mentioned that *"if there is no cost impact on getting people to do something differently then its fine. But as soon as it gets more expensive or affects the schedule then it's a challenge to get things done"*. Adding to this point, interviewee P5 stated that *"in the changing market condition we do see ourselves positioning for green projects where it's okay to be make a little bit less money, but we also need projects that maybe harmful but helps us earn more money as we have to pay our people and make profit for our shareholders"*. The table below illustrates the responses (in form of statement) to the corresponding indicators. The interviewee responses to the statements are mentioned in appendix D.1.

Table 4-3: Responses to balancing the TBL indicators (retrieved from interview transcripts)

Indicators	Statements
Social, environmental, and economic trade-offs	• Engagement with the local community • Bidding for sustainable projects like renewable projects

Primary driver on projects	• Primary focus is on economic growth, compliance with environmental stewardship, and social dimension is least important • Focus is on short term and not long term
Use of TBL criteria in assessing project performance	• No, project is assessed w.r.t cost and time • Reporting on the environmental aspects • Follow the regulatory compliance
Level of involvement in strategic and operational decision-making	• Balance w.r.t triple-P is achieved at strategic level (corporate) • Fluor will not go over and beyond in projects unless specified by clients

4.5.3 Stakeholder Engagement

The process industry is still a traditional and conventional market and the transition towards more sustainable alternatives has not yet reach the tipping point. The market is driven by client requirements and the clients acts as both enabler and barrier to sustainability implementation. If sustainability is not in client's requirements, then the EPC companies have less freedom to consider sustainability. The level of influence over the clients is relatively less. Interviewee P12 mentioned *"our ability to influence the actual technology being implied or technical solution being implemented is sometimes in most cases limited by choice of the client. The client determines the technology or material or designs"*. This quote is labelled as 'if client is in driving seat Fluor has very less influence'. As the literature suggests (section 2.2.3), managers need to be proactive rather than reactive in engaging clients to achieve sustainability objectives. In practice, the proactive approach is limited by the client's requirements and the uncertain benefits of implementing the sustainability practices. Interviewee P2 mentioned *"if implementing sustainability practices can be a reduction in costs, then Fluor will try to promote it and try to convince client to do it. If at a cheaper cost, we can build better or install more efficient system then we would definitely do it"*. In practice, the mindset is still at a stage where financial considerations drive decisions. This results in sustainability practices not being implemented if the client is not proactive. Interviewee P11 emphasized that while having a push from the client is vital, the EPC business should not wait for the client to tell them what to do; instead, discussing and implementing sustainability practices should be a routine process. However, interviewee P5 mentioned *"if implementing sustainability ideas would benefit the bottom line or project in terms of schedule acceleration or cost savings then it will get my attention and I will drive it"*. In contrast to the conclusions of the literature, in practice, implementing sustainability is limited by stakeholders' needs, and decisions are influenced by financial considerations. The table below illustrates the responses (in form of statement) to the corresponding indicators. The interviewee responses to the statements are mentioned in appendix D.1.

Table 4-4: Responses to stakeholder engagement indicators (retrieved from interview transcripts)

Indicators	Statements
Discussion regarding sustainability in client alignment meeting	• No initiative taken as client is not interested in it • We try to initiate discussions on topics that are relevant for the projects, but it depends on clients to take it forward
Value improving workshop (VIP) with client	• Not implemented because it is not asked by the client

	• Not used in previous and current project
Impact of client requirements on project sustainability	• If sustainability is not in client requirement no initiative will be taken • If client is proactive then Fluor will implement the practices and workshops
Influence of Fluor over clients	• If client is in driving seat Fluor has a very less influence • If the practices can lead to cost reduction, then Fluor will go over and beyond to promote it

4.5.4 Proactive Approach

Figures 2.10 and 2.11 were referred to operationalize the concept of proactive approach. During the interviews, participants were asked to rate the company's level of proactiveness at the strategic and operational level in relation to the five stages indicated in section 2.2.5. For organizations to be more proactive they must move from compliance and beyond to integrated strategy and above. The participants believe that at the strategic level the company currently stands between level 3 (beyond compliance) and level 4 (integrated strategy). However, at the operational level a more reactive approach is observed as the project goals are specified by the clients. The level of proactiveness at the operational level is compliance. The interviewees stated that *"at the strategic level, in our office, we certainly stand in integrated strategy. You often see initiatives being implemented and we are investing a lot in it. We have a climate neutral office and the office management also try to influence the social aspects"* whereas at operational level *"on projects it has all been about compliance. Its more reactive, its compliance driven more than being proactive and going beyond compliance"*. These quotes from the interviewees are labelled at 'strategic level- integrated strategy' and 'operational level- compliance' respectively. The interviewees agreed that compliance is not the best approach to sustainability, and that sustainability should be incorporated into all decision-making processes. The interviewees also highlighted legislation and market regulations as a barrier limiting the company's effort toward project sustainability. Interviewee P2 mentioned *"if legislation say that we can do things in a particular way which is necessarily not sustainable then it's not going to happen. In a way legislation must be strict. Companies will do all that is required to be done but will not go beyond those requirements at the expense of project bottom line"*. According to the top management, the project managers need to be more proactive in communicating the sustainability practices to the client. Simply, reacting to client requirements is not a viable option. Interviewee P11 stated *"project managers should pay more attention towards the practices as these will not necessarily lead to extra cost. For them to say nobody is pushing for it, they're just bypassing their accountability of what their expectation is"*. In conclusion, many of these factors are dependent on the people working on the projects, as currently implementing sustainability is voluntary and not a hard requirement. The table below illustrates the responses (in form of statement) to the corresponding indicators. The interviewee responses to the statements are mentioned in appendix D.1.

Table 4-5: Responses to indicators for proactive approach (retrieved from interview transcripts)

Indicators	Statements
Approach at operational level to sustainability	• More reactive approach • We do what clients ask us to do nothing over and beyond
Level of proactiveness from organizational perspective	• Strategic- Beyond compliance and/or integrated strategy

	• Operational- Compliance
Level of proactiveness from project perspective	• High engagement towards sustainability initiatives and collaboration with different organizations for sustainability reporting • No initiatives are taken unless specified by client
Difference in strategic and operational level proactivity	• More initiatives and investments for the corporate and office level • Proactiveness at operational level corresponds to clients motivation towards sustainability

4.5.5 Lifecycle Thinking

The literature highlights the importance of lifecycle thinking in aligning processes with sustainability. According to the literature, the relationship between sustainability and project management is as follows: sustainability of project deliverable and sustainability of process of delivering and managing projects. In practice, the latter is deemed difficult, and the emphasis is on the ultimate result. Interview P5 stated *"sustainability is embedded in the final project that's the facilities we build. But sustainability regarding how to build those facilities is not there and is not well defined"*. Within the EPC company, tools and processes allow reporting on sustainability during the construction phase, such as reporting on waste minimization, efficient material usage, noise reduction, and so on. However, there is no consideration of sustainability in material procurement or subcontractor evaluation. Acquiring sustainable material in a cost-reimbursable project is dependent on the client's requirements and decisions. Interviewee P2 stated *"on reimbursable the client dictates the terms and if client is not willing to fund then it limits your possibilities. On lumpsum it would be interesting to see whether our management agree to buy green steel at the expense of our own margin. I can tell you right now that it will never happen as it would erode our bottom line"*. Given the early stage of the project, it is critical to have a dialogue with the client about sustainability, as decisions made early in the project can have an impact on the entire lifecycle. According to the evidence, these dialogues occur only when the client is more proactive. Interviewee P11 stated *"In Fluor we have a mindset that we are only in the EPC phase we don't really look at things from a lifecycle point of view. There is a perception that if we work on projects that have a label of sustainability like carbon capture or biofuel project, then we are a sustainable company. But we really need to think on ways to execute project in a sustainable way"*. In conclusion, the company needs to develop perception of lifecycle thinking and consider strategies to make the process of delivering projects more sustainable. The table below illustrates the responses (in form of statement) to the corresponding indicators. The interviewee responses to the statements are mentioned in appendix D.1.

Table 4-6: Responses to lifecycle thinking indicators (retrieved from interview transcripts)

Indicators	Statements
Sustainability throughout the project lifecycle	• Initiation- inclusion of sustainability write-up in project proposal • Design- energy efficient designs • EPC- waste minimization, emission reduction, recycling waste, efficient use of materials • No consideration of sustainability in procuring material or assessing subcontractors.

Tools and methods for management of resources	• Sustainability action and screening tool- limited actions for design
Metrics and plans to monitor sustainability performance	• Not used in the projects, reporting on waste and emission is done separately
Use of screening tool for project sustainability reporting	• Corporate level- reporting w.r.t GRI standard, SPIMS for reporting on offices • No reporting system for projects. Only with waste and emissions

The responses indicate that efforts are being made to integrate TBL at the strategic level, but at the operational level, the economic aspect continues to be the key project driver. On the projects, the emphasis is on achieving short-term goals. The clients have more control over project decisions, this impacts how the practices are implemented and used on projects. If sustainability is not part of the client's ambition or requirement for the project, no efforts are made to engage in discussions about sustainability. Participants were asked to share documents relating to sustainability from their projects in order to examine the adoption of practices and guidelines indicated in company documents. Few participants gave insights into the sustainability aspects realized in their projects, while others are yet to adopt sustainability in their projects. There were not many projects where the project team took the lead on sustainability. However, in projects where sustainability was considered, either the client took a proactive approach to it or the project contained some form of sustainability requirement. The documents specific to each project that were reviewed are shown in the table below, along with the project guidelines.

Table 4-7: Review of project documents and project-specific guidelines (retrieved from: interviews)

Projects & Guidelines	Description	Sustainability Initiatives
P1	Chemical batch plant- produce a wide range of specialty chemical products and intermediates to supply oil and gas production industries.	• Waste management and recycling program on the construction site. • Reducing carbon footprint by non-use of light vehicles. • Use of LED lighting to minimize power consumption. • Implementation of sustainability screening tool to prioritize sustainability actions.
P2	Chemical and manufacturing plant	• The project was sustainable as the focus was on reducing and eliminating the emissions created during the processes carried out by client. • The sustainability program was defined by the client. But Practices from Fluor were not implemented.
P3	C2 capacity expansion- developing and expansion of process plant to produce chemical end products	• Use of sustainability tracking register • Light emitting diodes • Employee awareness of sustainability activities • Bulk purchases
P4	Revamp project	• No sustainability aspects were discussed in the project.

		• Main objectives- quality, cost, schedule, safety, and legal compliance.
G1	OSR- The document defines Fluor's required methods of operation and the application of work processes for projects. It includes sustainability practices that are mandatory on projects.	• Low priority is given to sustainability practice defined in the OSR. • The OSR doesn't include sustainability as an exclusive topic but is integrated with HSE.
G2	PEP- guideline developed for projects to be used in developing project specific execution plan. The sustainability guidelines are to be included in the project-specific PEP.	• For the P3 project sustainability plan was not included in the PEP. • The PEP presents the project baseline for execution and sustainability is not the key drivers in the baseline.
G3	PSR- project status review. Provides guidelines to include the strategic points and feedback for the projects.	• No discussion regarding sustainability in the PSR meetings unless initiated by PM. • For project P4 the main objectives in the PSR are cost, quality, and schedule. • Reporting on sustainability is not a mandatory requirement by management in the PSR.

According to the documents reviewed, no clear sustainability plan for the projects was established. It was discovered that although the project is self-sustaining, no additional activities were taken during the delivery process. Even though the implementation of sustainable practices is included in the operating system requirements, its priority remains low. Interviewees stated that Fluor could have more influence over sustainable decisions if the practices benefit the client by cutting costs. In terms of designing for sustainability, the tools in place do not offer many actions. Finally, at the corporate level, proactiveness extends beyond compliance and/or integrated strategy. There is strong interest in developing new initiatives and collaborating with other organizations to report on sustainability. At the operational level, a more reactive approach is observed by simply adhering to regulations and the needs of the client. There are no initiatives that go beyond the scope of compliance.

4.5.6 Discussion of the findings

The findings show that conflicts arise when translating high-level sustainability goals into operational-level objectives. Sustainability objectives are only pursued when it helps achieve an economic goal. However, sustainability targets are often disconnected to a company's strategic goals, and assessing sustainable development is becoming increasingly challenging (Hristov & Chirico, 2019). This is reflected in practice. The interviewees emphasized the importance of developing project-specific goals and then reporting on those goals to make the implementation tangible. The respondent also emphasized the importance of developing KPIs for the above-mentioned elements. These KPIs will be used to determine if activities and processes are progressing toward sustainability goals. Although the EPC company reports the organization's sustainability performance based on the GRI standard, there is no equivalent system in place for projects. Converting these elements into project objectives will facilitate monitoring project performance as well as managing both short- and long-term strategic objectives.

The next section presents the barriers influencing the implementation of sustainability at the operational level. The barriers are identified from the responses received in the interviews. These barriers affect the

implementation resulting in the gap between strategy formulation and its implementation. All of the participants believed that there is a gap between what is said and what is done.

4.6 Barriers Affecting the Implementation of Sustainability

The implementation of sustainability at the operational level depends on the number of internal and external barriers and drivers. The barriers challenge the translation of concepts into action i.e., concrete initiatives at operational level. Table 4.8 provides an overview of the barriers identified from the interviews. Some barriers identified are specific to the case company, but some are also comparable to the findings from the literature (section 2.1.5). The quotes from the interview transcripts are coded into different barriers; the barriers are the codes in Atlas.ti. For example, the statement by interviewee P2 *"On projects focus is more on the bottom line than on the environmental performance. Fluor will not go over and beyond compliance if it will cost money at the expense of the bottom line"* is labelled as 'focus is more towards short term gains'. The barriers identified are then grouped into internal and external barriers. Internal barriers influence corporate and business strategy, plans, and actions as well as sustainability performance, including TBL impacts, whereas external barriers limit organizations' attention to sustainability (Sroufe, 2017). These barriers impede the implementation of sustainability at the operational level, and their presence results in a gap between the strategic and operational levels. Appendix D.2 contains responses of different interviewees for each barrier identified in the analysis.

Table 4-8: Barriers affecting the implementation of sustainability strategy at operational level

Type	List of Barriers
Internal	Lack of push from top management
	Sustainability is not seen as project driver
	Lack of performance measurement and reporting system
	Sustainability is given lower priority
	People's mindset
	Practices are less practical and tangible
	Focus is more towards short term gains
	Sustainability is not a business driver
	Lack of business case for sustainability
	Financial benefits of implementing sustainability are unknown
	Sustainability is considered as cost
	Affordability of sustainable investments
	No additional time for discovering sustainable options
	Involvement after FEED phase
	Sustainability is seen as an additional task
External	Not in client's requirements
	Lack of industry specific guidelines
	Traditional approach
	Proposals are selected based on cost competitiveness
	Lack of incentive for sustainability implementation

One of the most frequently mentioned barriers by respondents is a lack of push from top management for incorporating sustainability into projects. According to respondents, senior leadership is critical in influencing an organization's focus on sustainability. Despite the fact that management has established project goals and practices, putting those goals into action remains challenging. As a result, there is no formal

reporting requirement or management requirement to implement sustainability activities on projects. A project team must present various reporting aspects for a project, but sustainability is not yet a parameter for project reporting. Such a push has yet to be seen in the EPC company. Until the management makes it clear that sustainability is an essential element for the organization, it is difficult to attain optimal sustainability performance. Trade-offs on environmental and social issues are acceptable if performance is solely assessed based on short-term gains or revenue contribution, which makes it more challenging to bring about the required change in organizational culture. In contrast, respondents (top management) believe that implementation should take place at the bottom and that it is the responsibility of project managers to put the practices into action. To conclude, people at the operational level expect more guidance/push from top management, and some people do not support this as they believe it should come from the people themselves. As a result, there is a need to strike the right balance and work together to overcome the challenge of sustainability implementation at the operational level.

The respondents also expressed frustration at the lack of performance measurement and reporting system. This is also one of the reasons why the practices are not being implemented. Respondents believe that because there is no request from the client or management to report on any type of sustainability activity as an indicator, they are not obligated to take any steps toward sustainability. This is also one of reasons behind sustainability being a lower priority on projects. There was a consensus on the practices being less tangible or practical, hence its non-measurable. There is only reporting on the environmental stewardship as it falls within the regulatory compliance by the industry. There is no effort to go over and beyond the regulatory compliance. The sustainability practices are not prioritized by the project managers even though these are mentioned in the project procedure guidelines. In a way it's not embedded within the system to proactively implement sustainability practices.

The most important trigger identified in the literature and mentioned in the interviews is "not in the client's requirements or willingness to pay." Because projects are driven by client requirements, sustainability will not be implemented if it is not a project requirement. Respondents believe that the main business driver is completing projects based on client needs in order to maintain market competitiveness and business continuity. Many factors are dependent on the client's sustainability requirements. If the client is proactive about sustainability, the EPC company will take the initiative and implement it; otherwise, the EPC company will do the bare minimum. Although, as a big player in the market, a lot of influence can be put on clients in considering sustainability as a project requirement. However, because the financial benefits of implementing sustainability are unknown and there are no examples/cases to present to the client's, a more reactive approach is observed at the operational level. The primary goal of the case company, as indicated by the majority of the interviewees is to serve its clients. This perception contradicts the sustainability strategy discussed in Chapter 3, as proactive behavior is preferred when discussing sustainability. The mindset of simply responding to client needs limits the implementation of sustainability strategy. As this is not a project requirement, it also results in a lack of motivation to initiate discussions with clients.

Furthermore, Respondents stated that the company operates in accordance with industry and market demands. They believe that the need for sustainability should be driven by industry guidelines or the market, as the proposal or bids are still based on cost competitiveness and client requirements and exceeding these requirements will result in contract losses and a negative impact on the business. Due to the nature of the industry the company operates in, traditional constraints continue to outweigh sustainability. Some respondents also indicate that, because of these external factors, options for sustainable interventions (such as the value improving workshop) are not communicated to the client.

According to the literature review, the proposal phase of a project is critical for integrating sustainability into the projects. Several respondents mentioned Fluor's late involvement in projects, i.e., during the EPC phase. Besides the late involvement, the contracts being cost reimbursable do not allow for changes due to sustainability because the client is in control. There is no way to change the project designs during the EPC phase. Entering after the FEED phase is thus identified as a constraint for sustainability strategy implementation. Furthermore, in lump sums where there is a high likelihood of sustainable interventions, the financial benefits of investing in sustainable materials are unknown. As a result, contracts are primarily focused on meeting the traditional constraints of cost, quality, and time. This is also considered as a limiting factor for sustainability implementation. The respondents believe that early engagement with the client in a project is key for consideration of sustainability in projects.

Another element influencing the opportunity for implementing sustainability strategy at the operational level is a lack of time for investigating sustainable options. Sustainability integration is described as an iterative process; nevertheless, in many cases, there is insufficient time to identify and develop these solutions. Although limited number of respondents stated this reason but it has high impact. According to them, project managers are overloaded with tasks that have a first order of importance for the projects, and if sustainability is not a need, spending time researching alternative choices is not in the best interests of the project. As a result, people regard sustainability as an additional task and place less emphasis on it. Hence, it is included as a barrier in this analysis.

Respondents also stressed the importance of developing project-specific sustainability goals and practices. According to the respondents, because the practices are not project-specific, it is of low priority to even be considered as a topic of discussion with the clients. Respondents believe that involving a sustainability team in the proposal phase to develop project-specific goals and strategies will help with project sustainability implementation. It will also be a means of persuading clients to include sustainability as a project requirement. The respondents emphasized the importance and necessity of sustainability, and there was consensus that "compliance" is not the best approach to sustainability and that sustainability should be included in all decision-making.

Apart from organizational structure and guidelines, managerial and human barriers are extremely important. The mindset of people is crucial in determining how sustainability will be embedded into projects. If people do not recognize the importance of implementing sustainability and are only concerned with making a profit, integrating sustainability and convincing clients becomes difficult. The respondents believe that there is lack of culture and motivation for sustainability within the organization. Interviewee P8 mentioned that *"I mean, the procedures and practices are there that we can absolutely do on the project level. I mean, there are all the reason to do it. But there must be a mechanism in place where there is continuous follow up. And, yeah, why we are not doing that, because it's not so urgent and we don't feel the urgency to do it. So maybe it's wrong, but that is basically the reality."*

The respondent acknowledged that there is a gap between the strategic and operational levels, i.e., between what is said and what is done. The identified barriers undoubtedly contribute to the gap, resulting in sustainability goals to remain stuck within the initiating department. There is much debate about sustainability as a valuable component for projects, but data shows that there is little evidence of successful implementation of a sustainability strategy. Barriers also occur as a result of resistance between top management and project managers. There is a difference in opinion on how things should be done. Interviewee P5 mentioned *"we are stuck in the middle where some are expecting guidance and some people do not want to give guidance as they feel that it should come from the people themselves"*. Project managers believe that a strong top-down approach is required, whereas

top management argues that it is the responsibility of project managers to implement sustainability-related decisions on projects.

The following table illustrates the similarities and differences in the perspectives of people in top management and project managers. The quotes related to the statements mentioned in the table can be found in appendix D.3.

Table 4-9: Perception of top management and project managers (retrieved from: interviews)

Aspects	Management Perspective	Project Managers Perspective
Push	Push should be from bottom-up	More push from top management
Client	Project is driven by client requirements	On projects client is in driving seat
Time	Misconception of project managers on not having time for sustainability program	No time to look at sustainability program
Practices	Practices can lead to development of sustainability action	Practices are not tangible or practical for implementation on projects
Follow-up	There should be feedback loop from bottom-up	Reporting on sustainability is not requested
Cost	Implementing sustainability program doesn't always cost money	Implementing sustainability programs comes with cost

In the semi-structured interviews, the interviewees were also asked to provide some enablers that will help improve the implementation of sustainability in projects and the focus areas to bridge the gap between strategic and operational level. The following section presents the enablers identified from the interviews.

4.7 Enablers to Sustainability Implementation

Although the key objective of the interviews was to identify important barriers hindering the integration of sustainability into projects, participants were asked to suggest some enablers to obtain insights into how the currently existing process can be enhanced. Enablers are defined as the factors that helps the integration of sustainability (Peenstra & Silvius, 2018). The following enablers were identified through data analysis and subsequent coding in Atlas.ti:

1. **Increasing Awareness:**

One of the most important enablers is increasing the awareness regarding sustainability within the project actors such as client and EPC company project team. The first step towards a more sustainable way of delivering projects is increasing knowledge and awareness among the people including the client who shape the project. Increasing the awareness will help the project actors in understanding the impact of the action and decisions on the social and environmental aspects. As sustainability calls for organizational change, raising awareness within the people will aid in overcoming resistance to change (Zahid, 2021). Increasing awareness can be done by organizing workshops, trainings, and by discussing the topic of sustainability in projects. Interviewee P5 stated that *"awareness is very important. We should have discussions related to sustainability on a daily basis. This will create a starting point of various discussions related to sustainability"*. Additionally, awareness should also be created regarding the already established practices and guidelines within the company. Interviewee P10 stated that *"reading the practices first is a key factor as it will help people understand what it is, what it tries to achieve, and then its up to the project managers or project team to actually make something out of it. It's a simple step"*.

2. **Mindset:**

Change of mindset is considered an important enabler to help push the topic of sustainability within the organization. Having a long-term mindset can help move from reactive to more proactive approach towards sustainability. Also, the literature argues that change of mindset is required, in which project managers takes responsibility for the sustainability within their projects. Interviewee P1 mentioned that *"A lot depends on the project managers when it comes to the topic of sustainability in projects. So having that mindset where sustainability is considered an important factor is must"*. Interviewee P5 stated that *"Its about getting it in the minds of people. With safety we are brainwashing the people almost every day, with sustainability it should also be the same. It is currently seen as an extra activity and not as an opportunity. It should be embedded in everything that we do"*. The interviewees also stated that as a company it is important to have that mindset in order to be the frontrunners in the changing market conditions.

3. **Role of client:**

In projects, the clients also play a role of enabler as the decision-making power lies with them. If the client is proactive and is focused on integrating sustainability then the EPC company will provide all support in achieving those goals. As mentioned earlier, if the client is proactive the EPC company will go over and beyond in achieving the set goals. Interviewee P12 stated that *"the industry is very much driven by clients behavior and there are clients that consider sustainability as a business opportunity but there are some clients that still see it as not a competitive advantage. In that case our ability to influence is relatively small"*. Interviewee P2 stated that *"as a company we do what our clients asks us to do. So, the clients play a huge role in pushing sustainability in projects. This is not just for us but also for the industry as a whole"*. Interviewee P4 mentioned that *"if the clients really wants to focus on sustainability and select contractor that contributes best to reaching sustainability goals instead of just lower price, then that would definitely help companies like Fluor in being creative and more proactive in developing solutions that can make projects more sustainable"*.

4. **More discussion and dialogue:**

More discussion and dialogue about sustainability within the organization and with clients is another crucial enabler. Discussion and dialogue about sustainability promotes the creation of new ideas and the constant evaluation of organizational strategies and procedures. It also aids in the sharing of information among project actors and the interchange of critical inputs, resulting in more sustainable projects. This will aid in understanding client sustainability requirements in order to exert more influence over them. Interviewee P5 stated that *"its about asking questions which makes people think about it. I believe we can influence the people within the company but also the clients. We need to keep discussing it with the client as there are lot of things that can be done between the compliance and beyond compliance level"*. As sustainability entails thinking long-term rather than short-term, discussions and dialogues should be ongoing throughout the project's lifecycle. Interviewee P12 stated that *"we need to talk more about sustainability, it's not just a tick in the box kind of thing"*. Interviewee P8 stated that *"I think people need to discuss it more. It is simple to say that sustainability is important but what are we going to do with that? What is the problem? So, we need to keep discussing within project teams and with the management on what we can do regarding sustainability"*.

5. **Defining the bare minimum:**

Setting internal requirements and defining the bare minimum within the EPC company will ensure that sustainability is taken into account during project decision-making. Interviewee P2 stated that *"As a starter I think we should establish our own internal requirements. What is the bare minimum we as Fluor would accept? There is a need to define these things. I think Fluor as a company should start making its position clear. What is non-negotiable for Fluor? Maybe it could have a negative effect in the form of losing contract. Look, if you don't ask yourself, if we are not being awarded*

that contract, what's that contract even worthwhile to be awarded to us, right? Do we want to work for such a client? It's all about what you think as a company and as a corporation, what should be your bare minimum. Interviewee P5 mentioned that *"to be more proactive we as a company should define what Fluor wants to be in terms of sustainability in how we execute projects and what kind of work you want to do for our clients as part of project. Until and unless we don't do it you will see a reactive approach"*. Having set internal requirements will make it clear for people what the company expects with respect to sustainability on projects.

6. **Push from top management:**

The analysis showed that the acceptance of top management as well as the responsible project managers is a pre-requisite for successful implementation of sustainability strategies. Push from management is highly influential in generating commitment to sustainability implementation. Push from management will boost people's engagement in achieving the strategic goals related to sustainability. Interviewee P2 mentioned that *"If the management doesn't ask for sustainability reporting on projects then people won't do it. There has to be more direction from the top management. As a corporation I expect from the company to give me clear guidelines and direction on what should be done about sustainability and not leave it on the individuals.* Interviewee P4 mentioned that *"at this moment integrating sustainability is voluntary and not mandatory. There are several practices developed but people just don't use it. So, I think more push from the top management is needed. If the management try to influence by setting some requirements or instruction then people will take it seriously"*. Interviewee P12 stated that *"indeed we as a management team need to do a better job in defining the goals and in communicating the strategies. And then we need to start reporting on those goals so the people will feel accountable for it"*. The role of management should not just be to develop strategies and procedures but also to drive sustainability proactively within the organization to instill a sense of urgency for sustainability.

7. **Measuring tool:**

The measurement tool is regarded as a significant enabler as it aids in measuring the company's actions linked to sustainability and performance in reaching strategic goals. Managers can use a measuring tool to evaluate project performance and assess the impact of sustainability initiatives. It also provides clarity for those working on the projects as the measuring tools can yield tangible results. This assists in demonstrating to clients the practical benefits of implementing sustainability. Interviewee P1 mentioned that *"it is important that we start measuring. We need to make it more visible and set clear targets"*. Interviewee P11 mentioned that *"having a measuring tool that has predefined KPIs so that projects can just pick them up and implement, so that will be helpful. Just to make it more tangible, because at the end, that's what the project wants"*. The interviewees also believe that measuring tools can help in having more discussions among project teams and with the clients as it can assist in prioritizing the initiatives that helps in achieving maximum value through projects.

According to the respondents, these enablers can help boost the process of implementing sustainability and enhance the company's existing procedures. These enablers will have a positive impact on change management through process improvements, design innovation, and people engagement. It is critical for the EPC company to focus on these enablers in order to expedite the push toward sustainability. As stated in the research introduction, the focus has shifted from understanding WHY sustainability implementation is important to determining HOW sustainability may be integrated into organizational processes. As a result, these enablers will enable the organization to understand "HOW" change will occur and to determine whether the processes are generating progress toward sustainability goals.

4.8 Conclusion and Next Steps

The aim of the semi-structured interviews was to increase the knowledge concerning the implementation of sustainability strategy by analyzing the use of the elements identified from the literature in practice and by identifying relevant barriers to sustainability implementation and the gap between strategy formulation and implementation.

Semi-structured interviews were chosen as a data collection method because they generate rich data and allow for follow-up questions on each topic. It also allows for the discussion of new topics that may arise during the conversation. A total of 13 interviews were conducted with people from the EPC company. It is unknown what causes the observed gap within the company and what complexities project managers face while integrating sustainability. As a result, the interviewees included people from top management (leadership position) and project managers. The interview was divided into different themes depending on the topic needed to be addressed. Organizational decision making, stakeholder engagement, lifecycle thinking, balancing TBL, proactive approach, project manager perspective, barriers, and recommendations were among the themes discussed. The data collected through the interviews was analyzed using the data analysis software Atlas.ti. Open coding was used to label the data obtained through interviews, yielding a total of 128 main codes. These codes were then divided into different themes in order to systematically structure the data based on the interview topic. These interviews themes are mentioned in appendix C.

The interview analysis highlighted the consideration of the elements (studied in literature) in the implementation of sustainability strategy. It also highlighted the difference between the strategic and operational level within the EPC company. With respect to decision-making, it was observed that the push regarding sustainability is lacking within the EPC company and a more proactive approach is needed at the operational level. There is more control over the decision-making at the strategic level than at the operational level. Proactive discussion with clients is required for integrating sustainability into projects. Additionally, the interviewees stated that the management of projects is dominated by the traditional triple constraint variable i.e., cost, quality, and time, and that these constraint continue to outweigh sustainability. It is difficult to achieve the balance between social, economic, and environmental impacts at the operational level as economic growth remains the main driver in projects and there is only compliance with the environmental stewardship. Achieving the balance between these is driven by the client requirements. In practice, the proactive approach is limited by the client's requirements and the uncertain benefits of implementing the sustainability practices. It was concluded that if the client is in the driving seat the influence of EPC company over clients is relatively low. The interviewees believe that a proactive approach is only observed when client is interested in sustainability or else only bare minimum is done on projects. Furthermore, the level of proactiveness varies from an organizational perspective to project perspective. At an organizational level proactiveness is observed in terms of integrated strategy whereas on project it is pre-compliance or compliance. The interviewees agreed that compliance is not the best approach to sustainability, and that sustainability should be incorporated into all decision-making processes. Lastly, there is no emphasis on lifecycle thinking, as people believe that implementing projects like carbon-capture or biofuel means the company is sustainable. However, there is a need to consider how project execution can be made more sustainable. More dialogue with clients early on in projects is required as decisions made early in the project can have an impact on the entire lifecycle. In conclusion, sustainability objectives are only pursued when it helps achieve an economic goal. There is a need to be more proactive in convincing clients to integrate sustainability in projects.

Additionally, the interviews also resulted in the identification of barriers affecting the implementation and resulting in a gap within the EPC company. In total 20 barriers were identified as shown in table 4.8. Participants' perceptions indicate that, while a sustainability plan has been developed at the strategic level, it is rarely implemented at the operational level. The pattern shows that while developing a project, professionals rarely discuss sustainability. Sustainability will not become an important topic unless it is communicated from Fluor to the client and vice versa. Although Fluor stresses sustainability as an important component of projects, data shows that there is little evidence of successful implementation of sustainability strategy. The data shows that discussion regarding sustainability are avoided due to the perception that it is seen as cost (no short-term gains) and will not be implemented by clients. The experiences of participants suggest a lack of discussion and Fluor's reactive role as mechanisms influencing the implementation of sustainability. The sustainability strategy is mainly applied implicitly, with no explicit consideration of sustainable measures. As a result, sustainability goals stay confined to the initiating (top) departments. A difference in perception was also observed among the interviewees, listed in table 4.9. Project managers insist on more push and steering from top management, whereas top management believes that embracement should come from the bottom. The analysis also emphasized the enablers in the process for stimulating the integration of sustainability in projects. These enablers are the starting point for the company to overcome the existing problems and to reduce the implementation gap.

Sustainability implementation calls for organizational change. This reinforces the need to investigate how the barriers can be overcome and measures to stimulate the implementation of sustainability. The next chapter focuses on how Fluor can overcome the barriers and develop a strategy to stimulate the implementation of sustainability at the operational level.

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CHAPTER 5: FRAMEWORK & EXPERT EVALUATION

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CHAPTER 5: FRAMEWORK AND EXPERT EVALUATION

The findings of chapter 4 provided a comprehensive overview of the barriers, the perception of sustainability strategy in Fluor and its implementation at the operational level. This chapter analyses the interview results and provides recommendations to the case company on how the implementation of sustainability at the operational level be stimulated. This chapter aims at answering the sub-questions 4 and developing a framework for the implementation of sustainability strategy.

SQ4: How can a sustainability framework be developed to enhance the implementation of sustainability at the operational level and bridge the implementation gap?

In the first section, section (5.1), the barriers are prioritized based on their likelihood of occurrence and the impact that they have on implementation of sustainability strategies. Section (5.2) provides recommendations to the EPC company to overcome the barriers. Section (5.3) presents the key focus areas resulting from the study in order to develop the framework. Section (5.4) introduces the sustainability framework and its components. Furthermore, section (5.5) presents the expert evaluation approach and the resulting outcome. Finally, section (5.6) delineates the sustainability framework followed by conclusion in section (5.7).

5.1 Prioritizing the Barriers to Sustainability Implementation

Prioritizing and mitigating barriers is critical for integrating sustainability at the operational level and closing the implementation gap. ***WHY?*** — Prioritizing the barriers is crucial so that EPC company understand which barriers have the biggest influence on sustainability implementation and lead to implementation gaps, and how those may be mitigated. This prioritization of the barriers will also aid in evaluating their influence on project sustainability implementation and how these impacts might be reduced. The interviews resulted in the identification of 20 barriers. The barriers are interrelated in the sense that one influences the other. For example, lack of push from top management affects sustainability in such a way that it is given lower priority by project managers on the projects. This was also addressed by the project managers in the interviews. Interviewee P1 mentioned *"It's not a top-down kind of thing as I don't think anyone from top management has ever approached me on any of my projects and asked me to report on sustainability as an indicator for projects. It's not a parameter that you need to show"*. Additionally, through prioritizing, low priority barriers can be avoided if high priority barriers are mitigated. For example, a lack of push from top management has a high likelihood of occurrence and a significant impact since top management has a strong influence in developing a mindset that emphasizes sustainability. Barriers such as "sustainability is given lower priority" or "no additional time for discovering sustainable options" are unlikely to arise if the EPC company's top management is able to push the move toward sustainability.

HOW? — As interviews were the primary source of identifying the barriers, they were prioritized according to their likelihood of occurrence and impact on sustainability integration. The possibility that a barrier will occur is simply defined as likelihood. The analysis in Atlas.ti indicates the occurrence, i.e., the number of quotations or responses by interviewees linked with the code (barrier) . The likelihood score is divided into four categories: severe (4), high (3), moderate (2), and low (1). The barriers were assessed based on their frequency of occurrence in the interviews. In total 13 interviews were conducted. So, if a certain barrier is mentioned by 13, 12, 11, or 10 interviewees, it is assigned a likelihood score of 4. The impact of each barrier is determined by the responses of the interviewees. The level of impact is based on the consequence a barrier would have on implementation of sustainability at operational level. The level of the impact is rated as severe (4), high (3), moderate (2), and low (1). The level of impact was evaluated based on interviewee explanations

of why and how the barrier affected implementation. Additionally, it is also based on the overall conclusion drawn from the interviews. For example, the respondents agreed that the barrier "not in client's requirements" can lead to sustainability not being integrated into projects, and vice versa. 12 out of 13 interviewees mentioned this as a barrier and agreed that client requirements decide what action are to be taken on projects. So, if the client is interested, sustainability will be integrated into projects. As a result, this barrier is given the impact score as severe (4). The table below shows the identified barriers, their occurrence (frequency), likelihood score, the reasoning, and the impact score. The priority order of the barriers is based on priority score i.e., likelihood score multiplied by impact score.

Table 5-1: Barrier prioritization based on likelihood and impact

No.	Freq.	List of barriers	Likelihood Score	Impact Response from interviews	Impact Score	Priority Score
1	12	Not in client's requirements	4	If sustainability is not in client's requirement, it will not be integrated in projects	4	16
2	11	Lack of push from top management	4	There is no drive for promoting sustainability within the decision-making levels	4	16
3	10	Sustainability is not seen as project driver	4	Unless sustainability actions on project can be measured or quantified it won't be a project driver or success criterion	4	16
4	9	Lack of performance measurement and reporting system	3	Hard to measure or evaluate the sustainability performance of project	4	12
5	7	Industry specific guidelines	3	No stringent regulations for sustainability in project execution mean organizations are not enforced to consider sustainability in projects	4	12
6	7	Traditional approach	3	Hard to promote sustainability in a traditional industry	4	12
7	9	Sustainability is given lower priority	3	The focus given to integrating sustainability in projects and in discussion within the organization reduces	3	9
8	8	People's mindset	3	More reactive approach is observed resulting in sustainability being sidelined	3	9
9	7	Practices are less practical and tangible	3	Practices won't be implemented as it is difficult to convince client on what is to be done	3	9
10	6	Focus is more towards short term gains	2	If focus is towards making profit sustainability will always be neglected as there is no immediate return	3	6
11	5	Sustainability is considered as cost	2	Hard to motivate clients if sustainability integration costs more	3	6
12	4	Proposals are selected based on cost competitiveness	2	Sustainability won't be considered if it results in more expensive bid	3	6
13	6	Sustainability is not a business driver	2	Unless sustainability is a business driver, sustainability will remain under emphasized on projects	2	4

14	5	Lack of business case for sustainability	2	Hard to convince clients on prioritizing sustainability integration	2	4
15	4	Affordability of sustainable investments	2	Unless there are any subsidies or benefits for voluntarily investing in sustainability it won't be prioritized	2	4
16	5	Financial benefits of implementing sustainability are unknown	2	Hard to showcase the long-term cost advantage of implementing sustainability	1	2
17	3	Involvement after FEED phase	1	There is no opportunity to influence project designs, but there is some opportunity to incorporate initiatives during the delivery process.	2	2
18	3	No additional time for discovering sustainable options	1	Unless the people on the projects initiates themselves, no actions will be taken regarding sustainability	1	1
19	3	Lack of incentive for sustainability implementation	1	Unless sustainability is a requirement no efforts will be put if there is no incentive	1	1
20	2	Sustainability is seen as an additional task	1	If sustainability is not a need for project, it will be seen as an additional task which is not in best interest of project	1	1

5.2 Recommendations to Mitigate the Barriers

To mitigate the barriers, it is important to provide recommendations to the EPC companies to ensure successful implementation of sustainability at the operational level and to bridge the implementation gap. This section presents the mitigation strategies for the barrier.

Chapter 4 described the barriers in detail, categorizing them as internal and external (table 4.8). However, data analysis revealed that internal barriers affect various aspects of the organization. For example, barriers such as people's mindset or a lack of push from top management focus on the human side of an organization, whereas barriers such as a lack of performance measurement and reporting systems or sustainability is not a business driver focus on the organization's architecture, and barriers such as a focus on short-term gains or sustainability is not seen as a project driver focus on the project environment and the company's reactive approach. Additionally, as mentioned in the previous section, the barriers are interrelated in such a way that one influences another, and a recommendation can help mitigate several barriers. Furthermore, aspects such as people, organizations architecture, and organizational approach should be taken into account when initiating a change within the organization.

As a result, in order to better understand the characteristics of internal barriers and assist the EPC company in effectively mitigating them, they are further categorized as structural, human, and service oriented. The external barriers remain unchanged. The table below presents the second level categorization of the barriers:

Table 5-2: Categorization of the barriers influencing the integration of sustainability

Category	Barriers
Structural	Lack of performance measurement and reporting system
	Lack of business case for sustainability
	Financial benefits of implementing sustainability are unknown
	Sustainability in not a business driver
	Practices are less practical and tangible
Human	People's mindset
	Sustainability is given lower priority
	Lack of push from top management
	No additional time for discovering sustainable options
	Sustainability is seen as an additional task
Service-oriented	Focus is more towards short term gains
	Involvement after FEED phase
	Not in client's requirements
	Sustainability is not seen as project driver
	Sustainability is considered as cost
	Affordability of sustainability investments
External	Industry specific guidelines
	Proposals are selected based on cost competitiveness
	Lack of incentive for sustainability implementation
	Traditional approach

The structural dimension focuses on the organization's structural features such as internal procedures, goals, and policies, among others. The human dimension is concerned with understanding individuals, their motives, and their points of view. The client perspective, economic advantage, reactive approach, and projects are the focus of the service-oriented dimension. It also focuses on the complexities of implementing sustainability strategies into action. Finally, the external dimension focuses on the nature of the industry in which the EPC company operate. It includes both the market and the regulations. The following section provides recommendations for mitigating the barriers of each category.

1. **Mitigating actions for structural barriers:**
   - *Measurement tools:* Creating performance measurement tools such as scorecards, evaluation criteria, and checklists will aid in measuring the sustainability performance of projects. This can include several key performance indicators (KPIs) against which the project is evaluated. The client and the EPC company should work together to identify the performance indicators to create a project-specific measurement tool or checklist. This will help in deciding which KPIs to use, when, and how.
   - These *tools* and *checklists* can then be integrated into existing procedures and guidelines. Although a screening tool exists to prioritize sustainability initiatives on projects, incorporating performance indicators related to life cycle thinking, designs, social aspects, and environmental stewardship in the tool can assist in monitoring the effectiveness of projects and project sites. The project managers should be involved in the development of sustainability plans that is viable and tangible. Furthermore, using these checklists will aid in tracking the benefits in terms of cost. This will help project teams reevaluate the criteria in order to enhance the value of sustainability. This will help people understand sustainability interventions.
   - *Need for recognition*- EPC companies must understand the potential and additional value of sustainability. In a changing market, focusing on projects could give the EPC company an advantage over its competitors. The communication of the strategies should be enhanced by making it simple and too complicated for people to understand.
   - *Treating sustainability as a separate topic on each project:* the EPC company must treat sustainability as a separate topic, rather than combining it with safety. This can be done by adding sustainability sections in project review meetings where the importance of sustainability is discussed. As safety topic is not compromised in any way similarly sustainability should also not be compromised. This increases the level of importance of sustainability over a period.
   - Making the position of sustainability coordinator a formal project position. Currently, the sustainability coordinator is an added responsibility of the HSE manager. The function of the HSE manager is to oversee safety, which is deemed non-negotiable in the industry in which the company operates. By delegating additional responsibility for sustainability to the HSE manager, sustainability will be sidelined and underemphasized. Hence creating a separate position on projects will result in sustainability being part of discussions and decision-making processes. This does not have to be a big responsibility, but the task of this individual is to simply discuss sustainability during project design decisions or client discussions. Furthermore, this individual should be responsible for identifying project barriers and developing mitigating steps. If the company wants to successfully implement change within the organization, it is critical that sustainability is treated equally like the other factors.

2. **Mitigating actions for human barriers:**
   - *Raising awareness:* More discussions and dialogue inside the EPC company are required to raise awareness. Daily discussions among the project team will create an environment where there is a

need and urgency to address sustainability. This will also result in the creation of points of interest, which may later be used for projects. More engagement between senior management and project teams will aid in the creation of a balance of control and accountability. Giving sustainability the same priority as safety will help to establish a drive for sustainability. Incorporating sustainability as a topic of discussion in the monthly progress meeting will aid in understanding the level of awareness and potential areas for improvement.

- *Top-down and Bottom-up:* Top management should include sustainability as a factor in project audits. Increased scrutiny through audits will foster an environment in which sustainability is valued in the same way as other variables such as cost or safety. Creating a feedback loop will also result in more bottom-up acceptance. Joint discussions amongst departments will develop new and innovative ideas that may then be discussed with clients. It will provide input and feedback on whether systems and instruments are insufficient or lacking, as well as what is required to make sustainability integration more efficient and successful.
- *Incentive:* incentives in the form of bonus, rewards or employee recognition can be given to the people within the projects for their efforts towards sustainability implementation. This will trigger the project teams to look at sustainable options that can be implemented on projects. This will motivate individuals to think about long-term rather than just short term.
- *Workshops:* conducting monthly value creation workshops to explore sustainability. Involving people from various disciplines will result in fresh ideas for sustainability. These internal seminars can assist in understanding what might be implemented on projects to maximize value. These workshops can also be used to educate people about sustainability and to improve company practices/guidelines. The aim of these workshops should be to generate ideas rather than just window dressing. Additionally, workshops should also be held at the departmental and individual project levels.

3. Mitigating actions for service-oriented barriers:

- *Creating awareness:* the first step towards integrating sustainability in projects is by creating awareness among the clients as they shape the outcome of the projects. There should be an open dialogue and discussion with clients about the value of incorporating sustainability into projects. The push towards sustainability should be from both the client and the EPC companies. The EPC companies can engage the client by demonstrating the benefits of sustainable options without compromising the traditional constraints. Raising awareness of the long-term cost savings through increased energy efficiency or the usage of sustainable materials.
- *Creating a business case* for sustainability will assist EPC companies in demonstrating the benefits of sustainability and long-term cost advantage to clients. This can be accomplished by documenting the lessons learned from projects that implemented sustainable initiatives and establishing a business case for those actions. This will also aid in the development of solutions that can be applied even after the FEED phase.
- *Being proactive:* the EPC companies must be more proactive in terms of engaging clients with respect to sustainability. Simply reacting to the client's needs will hinder the implementation of sustainability in projects. Proactively communicating sustainability vision and benefits will help provide a consistent picture of stakeholder's interests and intentions. The company should engage with the clients early in the project, preferably during the proposal phase, and make it a serious topic of discussion. The EPC company should not wait for the client to bring up the topic of sustainability; rather, it should be a common practice in the proposals that are presented to clients.
- *Beyond compliance:* In order to incorporate sustainability in projects, it is necessary to go above and beyond regulatory compliance. By determining the cost and benefits of people and planet related

solutions, decisions will be less cost-driven and more focused on future sustainable benefits. The interviewees agreed that including sustainability in all decision-making will lead to high engagement within the different departments as well as with clients.

- *Standard:* making sustainability a standard topic in all negotiations and decision-making related conversations. In addition to discussing the standard project elements, such as budget, time, and project requirements, making sustainability a standard point of discussion. This will increase awareness and help with understanding the visions involved.

Mitigating actions for external barriers:

- *Discussions:* Discussions on changing market trends and the impact that sustainability might have on a company's image. Clients in this conventional business must also be educated on the significance of diversifying their portfolio by including sustainable projects, as well as investing in making the construction process more sustainable.
- *Level of interaction:* An adequate level of interaction between research institutions and industry can lead to research findings being translated into practice. This will aid in the creation of new solutions to environmental concerns, as well as the development of cost-effective alternatives.
- *Awareness:* Clients must be made aware of evolving government rules mandating businesses to explore more sustainable solutions in order to meet carbon-neutral commitments. For example, assisting these businesses in reducing emissions. In order to function and achieve carbon-neutral goals, businesses must examine sustainable alternatives.

5.3 Key Inputs to the Development of Framework

The literature review presented the elements that an organization should consider when implementing sustainability strategies i.e., interaction between decision-making levels (strategic and operational), life cycle thinking, stakeholder engagement, balancing the triple bottom line, and proactive approach. It emphasized the need to operationalize the elements in practice in order to see their level of consideration in the EPC company's goals, strategies, and sustainability plans. During the document review, the difference between the strategic and operational levels was highlighted. In order to address the implementation of strategies in practice, indicators in the form of statements were developed and tested in interviews. The interviewee responses to the statements demonstrated the level of integration with the elements and outlined the reasons for the gap between the strategic and operational levels. The barriers identified in the interviews have an impact on implementation of sustainability at operational level. A difference in the perspective of top management and project managers was observed with regards to sustainability implementation.

According to the interviewees, bridging the gap between strategic and operational levels is necessary in order to implement sustainability strategies/plans. There is a need to connect these two levels in order to align the sustainability goals at operational level with the company's strategic objectives. This will also aid in measuring the sustainability performance at the operational level and to see how it impacts the long-term corporate performance. Few focus areas were identified as a result of discussions with interviewees. It was observed that it is challenging for the top management to translate the sustainability strategy into action at operational level. Interviewee P12 mentioned that *"the challenge that we have is how do we measure and how do we translate the strategy into smart goals for projects?"*. The project managers emphasized the significance of management push and having a checklist or measuring system in place to evaluate the project's sustainability performance. To engage clients proactively, project managers must be able to explain and communicate the business value of sustainability. Disparity is observed within the EPC company as the top management expects the project

managers to step up and be accountable for implementing sustainability whereas the project managers expect more push from the top management. There is a need to foster a culture in which people understand the importance of sustainability and what they can do within their roles to contribute to the achievement of long-term goals. The conflict that project managers face is between short-term project goals and long-term sustainability goals.

The findings show that conflicts arise when translating high-level sustainability goals into operational-level objectives. Sustainability objectives are pursued only when they aid in the achievement of an economic goal. According to Hristov & Chirico (2019), sustainability goals are often isolated from company's strategic goals, and analyzing sustainable development has become more challenging. This is reflected in practice. The interviewees underlined the need to define project specific goals and then report on those goals to have a tangible outcome. The respondents further stressed the significance of developing KPIs for the above-mentioned elements. These KPIs will be used to determine whether activities and processes are progressing toward long-term goals. Despite the fact that the EPC company reports the organization's sustainability performance using the GRI standard, there is no similar system in place for projects. Converting these elements into project objectives or sustainability actions will facilitate monitoring project performance as well as managing both short- and long-term strategic objectives. Furthermore, barriers connected to the human and managerial aspects are crucial in promoting sustainability throughout the organization. The emphasis should not only be on improving processes or techniques, but also on increasing attention to human elements. It is vital to build the right mindset and understanding about sustainability in order to bring about change within the company. As a result, while setting objectives/actions to measure performance, these soft parameters should also be considered.

Organizations' actions can either improve or degrade their sustainability performance. According to Epstein & Buhovac (2018), sustainability performance is the social, environmental, and economic performance of an organization and relates to the objectives that are important to the organization. The elements highlighted from the literature are deemed to be significant for implementing sustainability strategies at the operational level. To assess the consideration of elements in practice a set of indicators per element were developed. These indicators were then converted into open-ended questions to which the interviewee responses were recorded. The interviewee responses were then coded, as shown in table 5.3, column 3. Appendix D.1 contains the responses to each statement. According to the interviewees, the project's primary focus is economic growth. There is compliance with environmental stewardship whereas the social dimension is the least important. Short-term gains are prioritized over long-term gains. As a result, it is necessary to develop sustainability actions or objectives that can be implemented to monitor project performance in social, economic, and environmental dimensions. As indicated in table 5.3, the responses to the indicators resulted in several sustainability actions per element. These actions focus on certain areas of priority while assessing performance. Interviewees were asked to make suggestions or provide enablers to improve the operational implementation of sustainability. Based on the interpretation of the responses to the indicators and the questions concerning recommendations, relevant sustainability actions were derived. The development of actions, as well as a suitable measurement system, ensures that the strategy is translated into action. Table 5.3 presents the elements discovered from the literature, the indicators used to assess its application in practice, the responses received, and the output of the responses into appropriate sustainability actions.

Table 5-3: Sustainability actions per element

Elements	Indicators	Statements	Sustainability Actions
Organizational decision-making	Sustainability decision-making at strategic and operational level	• High level engagement at corporate (strategic) level and reactive at operational level • More control over decision at strategic level than at operational level	Developing communication plan Raising awareness Setting concrete requirements Development of standards Accountability
	Corporate sustainability strategy in project goal formulation	• Not considered as projects are very much driven by clients • No real contribution to Fluor sustainability goals when working on projects	
	Responsibility of decision-making	• Client PM team and Fluor (top management and project team)	
	Level of influence on decisions regarding sustainability	• Drive sustainability if it benefits project bottom line • Sustainability is not part of the discussion unless clients have it in the requirements	
Balancing the social, economic, and environmental impacts (TBL)	Social, environmental, and economic trade-offs	• Engagement with the local community • Bidding for sustainable projects like renewable projects	Environmental performance Health & safety Waste management Revenue growth Emission reductions Energy efficiency
	Primary driver on projects	• Primary focus is on economic growth, compliance with environmental stewardship, and social dimension is least important • Focus is on short term and not long term	
	Use of TBL criteria in assessing project performance	• No, project is assessed w.r.t cost and time • Reporting on the environmental aspects • Follow the regulatory compliance	
	Consideration of TBL in strategic and operational decision-making	• Balance w.r.t triple-P is achieved at strategic level (corporate) • Fluor will not go over and beyond in projects unless specified by clients	

Stakeholder engagement	Discussion regarding sustainability in client alignment meeting	• No initiative taken as client is not interested in it • We try to initiate discussions on topics that are relevant for the projects, but it depends on clients to take it forward	Employee satisfaction Client engagement Value improving workshops Supplier auditing Increasing technological capability
	Value improving workshop with client	• Not implemented because it is not asked by the client • Not used in past or current project	
	Impact of client requirements on project sustainability	• If sustainability is not in client requirement no initiative will be taken • If client is proactive then Fluor will implement the practices and workshops	
	Influence of Fluor over clients	• If client is in driving seat Fluor has a very less influence • If the practices can lead to cost reduction, then Fluor will go over and beyond to promote it	
Life cycle thinking	Sustainability throughout the project lifecycle	• Initiation- inclusion of sustainability write-up in project proposal • Design- energy efficient designs • EPC- waste minimization, emission reduction, recycling waste, efficient use of materials • No consideration of sustainability in procuring material or assessing subcontractors.	Life cycle assessment Material choice Resource consumption Monitoring and feedback Eco-efficient design Carbon footprint management
	Tools and methods for management of resources	• Sustainability action and screening tool- limited actions for design	
	Metrics and plans to monitor sustainability performance	• Not used in the projects, reporting on waste and emission is done separately	
	Use of screening tool for project sustainability reporting	• Corporate level- reporting w.r.t GRI standard, SPIMS for reporting on offices • No reporting system for projects. Only with waste and emissions	
Proactive approach	Approach at operational level to sustainability	• More reactive approach • We do what clients ask us to do nothing over and beyond	More dialogue Cross- department workshops

	Level of proactiveness from organizational perspective	• Strategic- Beyond compliance and/or integrated strategy • Operational- Pre-compliance/compliance	Conducting surveys Promoting sustainability culture Training & education Providing incentives
	Level of proactiveness from project perspective	• High engagement towards sustainability initiatives and collaboration with different organizations for sustainability reporting • No initiatives are taken unless specified by client	
	Difference in strategic and operational level proactivity	• More initiatives and investments for the corporate and office level • Proactiveness at operational level corresponds to clients motivation towards sustainability	

5.4 Introducing the Sustainability Framework

As shown in figure 2.11, section 2.2.5, in order for organizations to be proactive, they must shift from compliance and beyond to integrated strategy. To do so, organizations must develop a way of monitoring sustainability performance and evaluating the influence of short-term objectives on long-term performance (Rohm & Montgomery, 2011). Understanding the relationship between various actions and their effects on sustainability performance is crucial for developing an effective sustainability strategy. Organizations can enhance their operational decision-making by identifying these interrelationships and defining relevant performance indicators to measure success. This will also result in the development of a business case that links the influence of strategy on the organization, society, and environment.

Figure 5.1 presents the sustainability framework, which uses the social, economic, and environmental dimensions as its foundation. The framework describes the inclusion of barriers to sustainability implementation and mitigation strategies, actions that can be used to measure performance, and the repercussions of those actions on organizational sustainability performance. By understanding the barriers, performance actions, and their impact, it is easier to integrate information into operational decisions. The framework is divided into phases to offer a clear distinction between different components in the framework and to ensure that the deliverables produced at the end of each phase fulfill their objective.

The **input** phase includes the elements identified from the literature which are deemed necessary for implementing sustainability strategies i.e., organizational decision-making, lifecycle thinking, balancing TBL impacts, stakeholder engagement, and proactive approach. These elements guide management's (leaders) decisions and processes that the organization undertakes to enhance sustainability. The elements serve as a foundation for understanding the issues that organizations should take into account and take form of constraints that should be addressed.

Management can establish appropriate strategies, plans, programs, and guidelines to increase sustainability after examining the inputs and their expected effect on sustainability performance. In the framework, this phase is referred to as **processes**. These strategies, plans, and programs have three key effects: costs and benefits of actions, social, economic, and environmental impacts, and long-term financial impacts. Within the EPC company there are various plans, programs, and strategies in place for sustainability implementation. The EPC company should develop these plans such that it aims at improving the social and environmental performance. Organizations may not be able to realize the full benefits of sustainable performance if proper systems and programs are not in place. Aligning strategy, system, plans, and programs is critical for coordinating tasks and motivating people. The approach also involves two stages of client engagement. The initial engagement will aid in understanding the client's goals and ambitions for sustainability. These can then be used to create project-specific sustainability plans as well as value-improving workshops. Following the development of appropriate strategies and plans, it is critical to identify the barriers and develop mitigation measures. According to the literature and interviews, there are impediments in the process that influence the operational integration of sustainability. According to the research, organizations frequently struggle to transform strategy into project action plans. As a result, identifying the barriers and mitigating measures is a critical stage in transforming strategy (A) into actions (C). Client involvement at this stage will also aid in understanding client requirements, which can subsequently be utilized to identify potential barriers and design mitigation plans for them.

The internal processes component will aid in the development of sustainability actions that will assist in the measurement of sustainability performance and the translation of corporate strategy into action. In the

framework, this is referred to as the **output** phase. The client should be involved in developing actions again at this level, as the client determines the project objectives and requirements. The actions are designed in such a way that they have an impact on the internal structure of the company and help in developing people's mindset in order to improve the overall sustainability performance of the organization. The sustainability actions can be determined only after the company has a clear understanding of its strategy, relevant stakeholders, and objectives. Once the company has determined the sustainability actions to implement, it should establish a link between actions and sustainable performance. Through these actions, the EPC company can either improve or impair its sustainability performance. This can be done through developing and implementing the sustainability scorecard. Project managers should develop suitable KPIs to monitor and assess the value of each sustainability action adopted. For each KPI a measurement system should be devised. Measurement is essential as it connects performance to sustainability principles and allows for continuous improvement (Epstein & Buhovac, 2014). The measurement will aid in evaluating the effectiveness of those actions at the operational level, as well as understanding how one action influence another until long-term sustainable performance is achieved. The actions/objectives must be turned into a metric that can be linked to sustainability performance. Identifying appropriate actions and measuring systems (KPIs) is an iterative process as these are related to project requirements.

Together, the framework's input, processes, and output components will result in long-term sustainable performance. In the framework, this is referred to as the **outcome**. The end result is the combined sustainability performance of several projects that contribute to the company's long-term sustainability performance. The framework is built in such a way that the corporate strategy or goals at the strategic level cascade down through the organization, assisting in translating the strategy into action. This framework will also aid in tracking the progress of organizations and their strategies. Sustainability efforts span long-term; this framework will determine whether the organization is on track to meet its sustainability targets and whether the strategy is effective.

The framework also includes a continuous **feedback** loop that the EPC companies can utilize to evaluate and enhance their strategies. The feedback process is critical as it will challenge and change strategies and assumptions. The feedback is derived not only from the framework's final outcome, but also from the sustainability actions and measures that should be used for continuous improvement sustainability strategies. Auditing, monthly progress meetings, and scorecards should be used to provide feedback. The feedback process also includes the exchange of best practices and efforts within the company and across different projects.

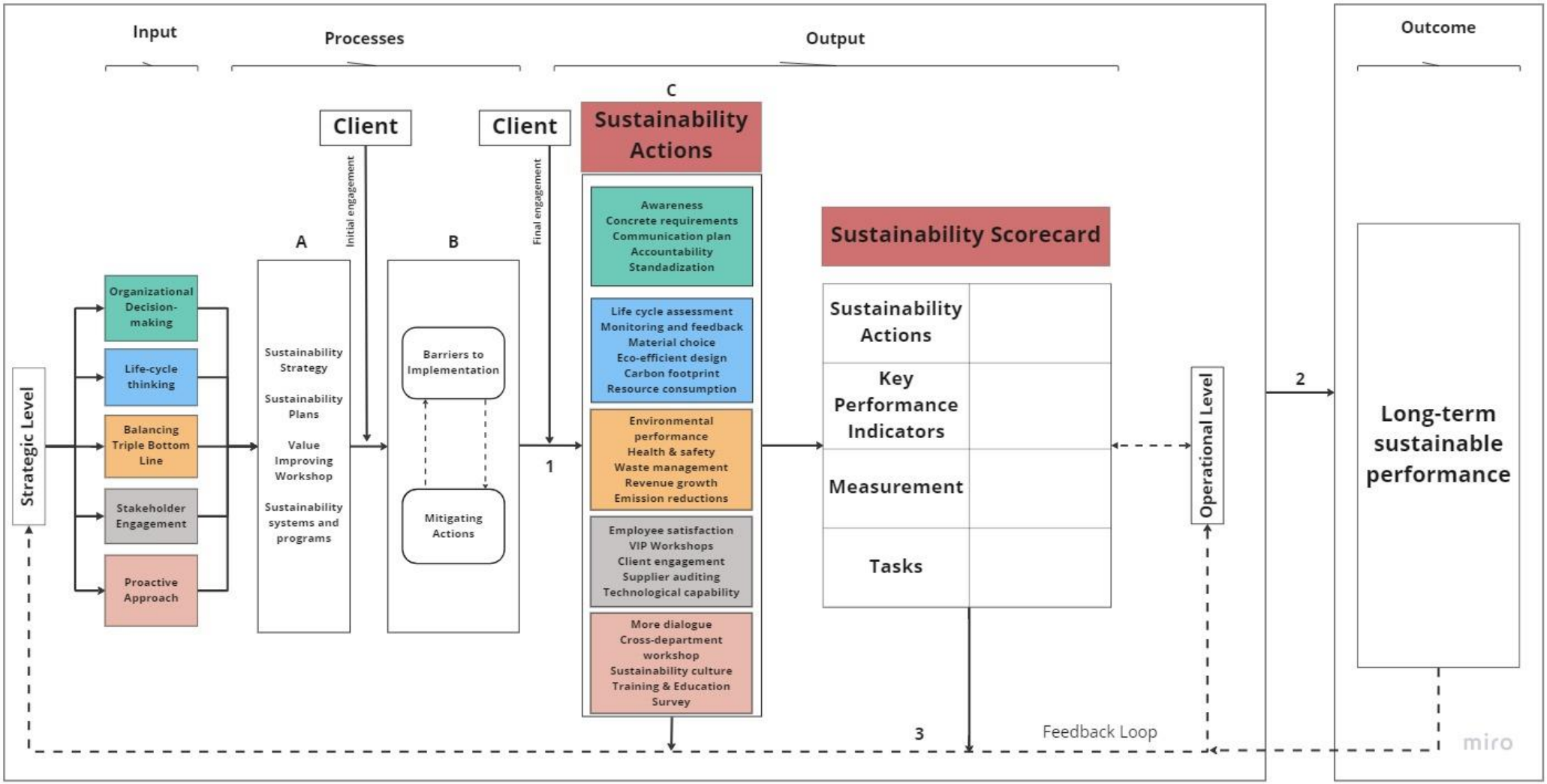

Figure 5-1: Sustainability integration framework

5.5 Expert Evaluation

This section describes the expert evaluation approach as well as the validation of research findings. The primary goal of the expert evaluation is to discuss the recommendations and framework developed in order to identify areas for improvement and their practicality.

5.5.1 Evaluation Approach

A focus group discussion was chosen as the method for expert evaluation. This method was chosen because it has a clear scope and purpose, and its group dynamic encourages participant discussion, producing high-quality responses and allowing the researcher to explore further (Statistics Solutions, 2021). The discussion for this research entails providing feedback and suggestions on the proposed recommendations and framework. The experts involved in this discussion are employees of the case company and the discussion took place in person. For the evaluation the experts were chosen based on their knowledge regarding the management of projects and involvement with the sustainability group. Since the semi-structured interview selection criteria did not allow for flexibility in having a diversity of participant experience, this was taken into account when selecting the participants for the evaluation meeting. The four panelists chosen for the expert evaluation meeting are listed in the table below.

Table 5-4: Selected participants for expert evaluation

Expert	Role	Experience (Years)
E1	Project Director	27
E2	Project Director	25
E3	Project Control Specialist	03
E4	HSE Engineer (corporate development and sustainability)	07

The major goal was to obtain input on the impact score of the barriers, mitigating strategies for each set of barriers, and areas of development for the proposed framework. The participants were asked the following questions: (1) Do you agree with the impact ratings given to each barrier? (2) Do you think the suggested mitigating actions will be effective in overcoming the barrier? And (3) Do you agree with the stages outlined in the proposed sustainability implementation framework, and what suggestions do you have for making it more practical? To add participant suggestions to the framework discussion, an online interactive whiteboard (Miro) was used. Participants suggestions and input are used to improve the barrier prioritization, recommendations, and proposed framework. The next section presents the results from the expert evaluation meeting.

5.5.2 Outcome of Focus Group Discussion

1. Barrier prioritization results:

The experts were asked to provide feedback on the proposed impact score for barrier prioritization. As the impact score was based on the authors assessment of semi-structured interviews responses, only the impact score was reviewed. Almost all of the experts agreed on the proposed impact score for the barriers, except for a few barriers. The change on the impact score is towards the higher side. The impact score is based on the interpretation of the results however the impact score of the barriers may change per project depending on the project requirements and characteristics. The changes to the impact score of a few selected barriers and the feedback provided for it is mentioned below.

- **Sustainability is seen as an additional task (impact score changed from 1 to 3)**

Experts feel that this barrier will have a high impact since it can lead to ignorance about sustainability. Experts agreed and stated that individuals should prioritize sustainability alongside other aspects such as safety and regard it as a routine work process rather than an added task. This mindset will have a high impact on the implementation of sustainability actions on the project. As a result, this barrier jumps up in the priority list by 4 places to number 16.

- **People's Mindset (impact score changed from 3 to 4)**

Although the experts agreed on the impact of this obstacle, they assigned it a severe impact score. Experts 1 and 4 stated that in order to achieve better project results, it is critical to have people with a sustainable mindset and motivation. The experts also stated that because the majority of sustainability-related actions are voluntary rather than mandated, it is vital to cultivate that mindset within the company in order to develop solutions that can assist the project improve its sustainability performance. They believe that having the right mindset is fundamental for being proactive rather than reactive. As a result, this barrier jumps up in the priority list by 1 place to number 7.

- **Sustainability is not a business driver (impact score changed from 2 to 4)**

The expert rated this barrier a severe impact score. Expert 2 mentioned that having a business driver is key to business change. The fact that the EPC company has not yet completely embraced sustainability as a business driver amid changing market conditions will have an influence on the company's overall success. Also, the barrier results in lack of push for sustainability and sustainability being given a lower priority. As a result, this barrier jumps up in the priority list by 3 places to number 10.

2. Additional feedback on mitigating actions:

The experts were asked to provide their feedback on the proposed mitigating actions for the categorized barrier groups. The experts stated that most of the mitigating actions are applicable to the company and steps must be taken in order to make sustainability a high priority and a requirement for projects. However, there were a few barriers where the experts disagreed and provided additional feedback. Those barriers are mentioned below:

- **Mitigating action for structural barriers: Need for recognition**

It was suggested that the EPC company understand the potential value of sustainability in order to boost their market credibility. Expert 3 disagreed, stating that understanding something is not always an action, but rather a goal/vision. The experts added that the company should focus on the sustainable execution of the projects as the impact in the execution is always high. Furthermore, the experts emphasized that sustainability should be embedded in the strategic decision mechanisms within the organization, and the company should be clear about what it intends to accomplish and what the people are expected to perform.

- **Mitigating actions for human barriers: Top-down and bottom-up**

According to experts separate sustainability audits on projects will impose an additional pressure on project teams. Instead of conducting audits, they advised adding sustainability as a reporting indicator in the project status review meeting. As these meetings are held monthly and involve top management, this reporting will occur more frequently rather than once a quarter or half yearly. Additionally, the experts stated that the discussions should be generated from the top management as senior leadership can strongly influence organizations attention towards sustainability.

3. Feedback on the proposed framework:

The experts evaluated the proposed framework by responding to the question, "Do you agree with the steps provided in the proposed sustainability integration framework, and what are your suggestions for making it more applicable in practice?" The experts' feedback and improvement points have been incorporated into the current framework. Overall, the expert agreed on the inclusion of various components in the framework, and a consensus was reached on the framework's applicability in practice. The following suggestions were drawn from the expert feedback.

- The experts agreed on the presentation and connection of different components in the framework. They did, however, propose that the phases proposed initially be changes to more project specific phases. It was intended to begin with strategy, then go on to project planning, project operations, and finally outcome. This classification illustrates the beginning and end of a systematic approach to translating strategy into action. The experts also proposed that the strategic and operational level blocks in the initial framework be renamed more explicitly, as project operations already is the operational level.
- The experts proposed that the client's existing position be changed by involving them in the development of sustainability plans, value improving workshops, and strategy (component A), as well as the identification of barriers and mitigating measures (component B). They did, however, emphasize that involvement can be direct or indirect, i.e., client's involvement can be beneficial, but the organization should not rely on client input to develop plans and objectives. Expert 2 added, *"we should not wait for clients to tell us what we should do; instead, we should be firm on what we are going to accomplish and what we propose to clients"*.
- In terms of sustainability actions/objectives, experts agreed that they should be project specific, but they should also include standard actions that can be implemented on different projects. These can include industry-specific actions like CO2 footprint and GHG emissions, as outlined in SKAO's CO2 performance ladder handbook (2020). This will normalize the actions and the scorecard, which can help to spark discussions throughout the organization about project progress in relation to the specific actions. The incorporation of standard actions will result in a combined result on the sustainability performance of various projects, which can then lead to the attainment of long-term sustainable performance and strategic goals.
- Expert 3 proposed that examples of different KPIs be included. According to the expert, splitting KPIs into leading and lagging will help predict where the project is headed in terms of sustainability performance.
- The experts agreed that the scorecard will help in changing people's mindsets within the company because it will spark a lot of conversation about specific actions performed on projects. Furthermore, experts believe that the feedback loop is critical for enhancing existing strategies and plans, as well as for continual project improvement. This will also aid in the development of a business case and the capture of lessons learnt in order to persuade clients to implement sustainability.
- The experts also agreed that the components in the strategy and project operations are critical for the framework's practical application. The experts believe that the scorecard can be incorporated into the company's standard project status review template for reporting on project sustainability performance. The strategy should send a clear message about what has to be accomplished, and the operations will aid in achieving those goals.

Finally, the framework will enable continuous improvement of strategies and plans by providing an understanding of which actions yield the greatest value. The outcome will also spark discussion about various projects' sustainability performance, ultimately fostering an environment in which sustainability is regarded as an important criterion. Changes to actions and indicators are also permitted, as is the incorporation of new ideas in the form of strategies and plans.

4. Insights gained from the expert validation:

The early phases of the project are crucial for integrating sustainability. The experts mentioned that this is an important phase for sustainability and proposed the following actions that should be taken within this phase: 1. Involving all project team members in discussion about sustainability and 2. Making the topic of sustainability a standard in project proposal discussions with clients. The influence of an EPC company vary based on the demands and type of client, which was also stated by participants in the semi-structured interviews. According to the experts, this is a mechanism that leads to a reactive role and a lack of dialogue on sustainability. Hence, if there is time reserved for discussion, the value of sustainability can be communicated to the clients. Furthermore, the expert discussion highlighted that there is a need to generate a sense of urgency with regard to sustainability, as well as a change in organizational culture in which all employees feel accountable to actively drive efforts toward sustainability. Aside from the clients' willingness to pay for sustainability, one of the most significant barriers to sustainability is on the human side. Proactivity necessitates a future directed mindset. Although the financial aspect is a critical factor in any project it is important that the EPC company and client find a way to create balance between people, the planet, and profit. The challenge that the EPC company faces is not the development of resources, but rather the development of the right mindset and the incorporation of sustainability into decision making. Expert 2 stated that *"if we really want to do something we should have strategy, plans, and mindset on what we want to do. That means if we face clients that disagree with us, we should be able to say to the client that we don't want to work with you. At this moment we don't do that, we are simply reacting to what our clients say. And if we are bold enough to say that then things like lack of push or motivation will just disappear"*. There is currently a momentum in the industry toward more sustainable ways of working, therefore if the EPC company wants to be a part of this momentum, they must decide how they want to operate and the type of client they want to work with.

The section that follows presents the updated sustainability implementation framework that takes into account the expert suggestions.

5.6 Final Sustainability Framework

The framework's process was explained in section 5.4, but the framework has been updated with more specifics based on feedback from the focus group discussion. The framework's new phases are described below:

- **Strategy:**

The strategy phase includes the strategic goal, vision, and objectives of the EPC company. This is the first component as development of these leads to improved sustainability performance. The plan should take into account both internal and external variables that lead to sustainability-related actions and their impact on long-term corporate social, environmental, and economic performance. The EPC company has developed a corporate strategy that is followed throughout the organization, as well as an office strategy that is tailored to each office based on the requirements, market, and projects that they do. The strategy plans should also consider ways of increasing awareness and educating people in order to create a sustainability culture.

- **Project Planning:**

Initially, in the proposed framework the elements were grouped in the input phase, while the sustainability strategy, systems, plans, and barriers and mitigation actions were grouped in the processes phase. Taking experts suggestions into account, these three components are classified as project planning components. According to the literature research, consideration of the indicated element is required for the formulation and implementation of strategies. As a result, they contribute to the development of appropriate strategy plans, methods, systems, and programs. These components must be in sync in order to coordinate activities and motivate people. As this phase is part of the project proposal phase, the EPC company should involve the clients in the development of sustainability strategies and value-improving workshops. The client's participation will aid in determining their sustainability goals and objectives. However, this involvement may not always be helpful hence the EPC company should appoint a sustainability coordinator to develop plans that can be included in the client proposal. The sustainability coordinator, as described in the mitigating steps, should initiate dialogues with clients, as well as identify potential barriers and implement mitigating actions. The impact of the barriers may change according to the project requirements and specifications resulting in changing prioritization of the barriers. For example, a project with sustainability as a requirement will influence the barriers such as lack of push from top management by reducing its impact on sustainability implementation. Hence, this early involvement of the sustainability coordinator is crucial for influencing clients since decisions made early on will have an impact on the project throughout its life cycle. The framework's project planning phase will aid in the development of strategies and procedures for evaluating both social and environmental performance, as well as trade-offs that must be made when there are barriers to implementation.

- **Project Operations:**

The following phase is project operations. This phase is critical since it is where the strategy is translated into action. The measures, as advised by the experts, are a mix of standardized and project-specific actions. The project-specific actions are more closely tied to the project goals and targets to be met. It also includes some standardized actions to normalize the application of this framework and to monitor the sustainability performance. These actions also include industry-specific criteria such as carbon footprint or GHG emissions, as well as company-specific actions. As stated in section 5.4, the company improves its sustainability performance through its actions. Furthermore, it is critical to translate actions into measures or KPIs that will aid in measuring sustainability performance. The system for the framework is a sustainability scorecard that can be used to define KPIs, metrics, and tasks for each sustainability action. The scorecard will aid in measuring the efficacy of such actions as well as the potential payoffs of sustainability actions and initiatives. According to the experts, the scorecard should be included in the project status review. This will aid in generating the drive for continuous project improvement.

- **Outcome:**

This phase consists primarily of project results and evaluation of sustainability performance. This phase will highlight the social, environmental, and economic advantages realized as a result of the sustainability actions. According to experts, this phase is the outcome of the operational implementation of the sustainability strategy. The findings will aid in the development of a business case for the organization and the capture of lessons learned in order to persuade clients to implement sustainability. The business case will also assist managers and the corporation in effectively incorporating social, environmental, and economic factors into corporate strategies.

- **Long-Term Results:**

As mentioned in section 5.4, the framework contributes to the company's long-term sustainable performance. Long-term sustainability goals will be achieved by the continual assessment and reporting of sustainability performance via the measuring system. The outcome will also demonstrate the long-term cost benefit of implementing sustainability. Long-term sustainability performance will impact financial results by increasing revenues and lowering costs.

- **Arrows:**

The framework's many components are linked together by arrows. Arrow 1 serves as the framework's baseline and demonstrates the systematic method of translating strategy into action. It also demonstrates the effect of project planning on sustainability performance. Arrow 2 indicates the influence of process implementation on the company's long-term sustainability performance. Arrow 3 depicts a feedback loop that can assist managers in evaluating their assumptions to determine the viability of various decisions and their long-term implications on the organization, society, and environment. This feedback system, as well as capturing lessons learned, are critical for implementing strategies and creating a sustainable culture in the organization.

- **Practical Implementation:**

The experts suggested that the framework can be used in practice by focusing on developing the key performance indicators. This component of the framework is considered the most important for practical implementation of the framework. Expert 3 highlighted the use of both leading and lagging indicators to assess project sustainability effectiveness. The use of leading and lagging indicators will aid in anticipating the project's sustainability trajectory. A more proactive approach would be to supplement lagging indicators with leading indicators. This assists managers in understanding the effects of their decisions on long-term performance. Toxic emissions, for example, are both a lagging indicator of process efficiency and a leading indicator of environmental costs or work-related injuries could be a leading indicator of employee satisfaction and a lagging indicator of HSE programs. The project managers should develop both these indicators for projects and measure the performance of projects.

Another suggestion for practical implementation is to consider both standardized and project specific actions. The standardized actions can also be derived from the industry regulatory guidelines. The combination of both these actions can result in evaluation of short-term as well as long-term performance. The inclusion of standardized actions can also help in normalizing the framework and creating a standard reporting template in the project status review meetings.

Furthermore, the implementation would be incomplete without capturing the lessons learned. Lessons learned should be documented continuously during the course of the project. Project reporting or auditing is one way to capture the lessons learned. This will also help in changing the mindsets of people as a tangible output can be achieved from implementing the framework. This will also trigger discussions to continuously improve the performance and develop strategies. However, it is crucial that the management promotes this as a change-driver and influences the organizations' focus on sustainability. Utilizing the suggested framework to make the strategy explicit has the following benefits: it encourages communication and execution of the strategy, allows for discussion of the strategy within the organization, and tracks the progress made toward the accomplishment of long-term goals to determine whether the strategy is clear or needs improvement. Figure 5.2 presents the final sustainability framework.

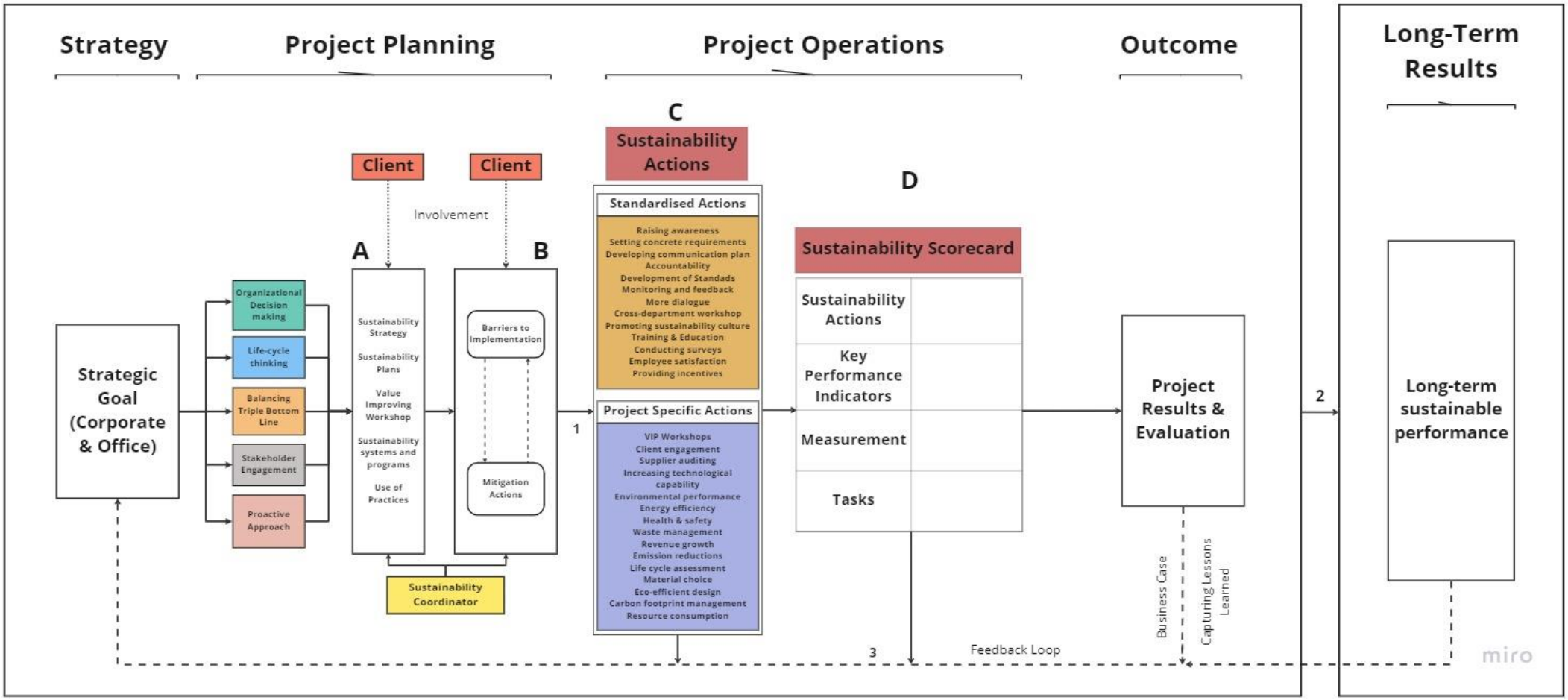

Figure 5-2: Final sustainability integration framework

5.7 Conclusion

The purpose of this chapter was to develop an approach for enhancing sustainability implementation and bridging the implementation gap. The semi-structured interviews assisted in identifying barriers to sustainability implementation as well as reasons for the observed gap.

To bridge the gap, it is necessary to first identify which barriers are likely to occur and have a significant impact. This is accomplished by ranking the barriers in order of likelihood of occurrence and impact. Each barrier was given a score based on its likelihood and impact. The likelihood score is determined by the number of times the interviewees mentioned it. The impact score was provided based on how the barrier affects implementation and on the overall conclusion drawn from the interviews. The likelihood and impact scores are assigned using a four-point scale: severe (4), high (3), moderate (2), and low (1). The likelihood and impact scores were then multiplied to determine the priority score. It was observed that the barriers "not in client requirements," "lack of push from top management," and "sustainability is not seen as a project driver" have the greatest influence on sustainability implementation at the operational level. It was also seen that barriers such as people's mindsets have a large impact and can impede organizational progress toward sustainability.

Following the prioritizing of barriers, mitigation strategies were provided to overcome these barriers. It was discovered that the barriers are interconnected in such a way that a recommendation can aid in the mitigation of a few barriers. To better understand it, the barriers were classified into four types: structural, human, service-oriented, and external. Mitigation actions were provided for each type of barrier, as well as actions that the EPC company should take. Section 5.2 details the proposed mitigating actions.

The proposed framework was adopted as the way for integrating sustainability at the operational level and bridging the gap between the strategic and operational levels. To develop the framework, it was important to first establish key focus areas that emerged from a literature review, document review, and semi-structured interviews. The elements selected from the literature review serve as the framework's starting point. The use of these in the development of plans, guidelines, and strategies will aid in the alignment of operational and strategic goals. From the interviews it was concluded it is challenging for the top management to translate the strategic objectives into smart project goals. The interviewees also stressed the importance of measuring sustainability performance using a suitable measurement system. The project managers stressed the need for managerial push and having a checklist or measuring mechanism in place to evaluate the sustainability performance of the project. The interviewees emphasized the importance of defining project-specific goals and then reporting on those goals in order to achieve a tangible outcome. Several indicators per element were generated through literature and document review in order to assess their application in practice through interviews (section 3.6). The interview responses resulted in the development of sustainability actions that are necessary to operationalize these elements in practice. The primary focal areas are as follows: elements identified from the literature review, strategies and plans reviewed in the document review, findings of semi-structured interviews per element, barriers to sustainability implementation, and sustainability actions.

These components combine to establish a strategy-to-action framework for implementing sustainability. The framework is divided into five main categories: strategy, project planning, project operations, outcome, and long-term results. The strategy includes the strategic goals of the company, the project planning components includes the five elements, sustainability strategy, plans, system, & programs and barriers & mitigation measures. These results lead to the formulation of sustainability actions that will be undertaken in order to monitor sustainability performance. The performance of each sustainability action can be measured by

developing KPIs. The indicators will help in evaluating the operational effectiveness of those actions, as well as understanding how one action influences another until long-term sustainable performance is attained. The project results and evaluation is the fourth category of the framework. This will aid in reviewing performance and identifying areas for improvement in strategic plans and goals. This phase also includes the development of a business case and the documentation of lessons learned, which should be utilized internally to promote sustainability and externally to engage clients. These four phases culminate in long-term sustainability performance and the management of corporate social, environmental, and economic impacts. The framework is designed in such a way that the strategic level goals cascade down through the organization, assisting in translating the strategy into action.

The framework was also validated through focus group discussions with experts from the case company. The purpose of expert evaluation is to ensure that the proposed solution is practically applicable. A panel of four experts evaluated the proposed barrier priority table, mitigating actions, and sustainability implementation framework. The experts provided crucial suggestions for improving the framework. The final version of the framework included the feedback provided by the experts.

The next chapter discusses the research findings as well as the potential limitations of the research.

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CHAPTER 6: DISCUSSION

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CHAPTER 6: DISCUSSION

This chapter discusses the research findings in section (6.1) and addresses the limitations of the research study (6.2).

6.1 Results Discussion

Sustainability is seen as a major challenge that must be addressed and can no longer be ignored. Corporate organizations play an important role in achieving and contributing to sustainable development. However, for organizations, particularly contractors, translating high-level strategic sustainability goals into specific actions for projects remains highly challenging (Marcelino-Sádaba et al., 2015; Engert & Baumgartner, 2015). This research is aimed at answering the main research question *"How can EPC contractors operating in the process industry pro-actively integrate strategic sustainability objectives into the operational level of their organization"*. To achieve the desired result, the research is organized as a qualitative study divided into three phases based on four sub-research questions.

The concept of sustainability is researched in depth through the literature review, specifically in the context of corporate organizations, the process industry, and EPC contractors. According to the literature, a proactive approach for sustainability necessitates the transformation of a company's processes, services, business model, and resources (Silvius & Marnewick, 2022). This includes reviewing the elements that must be considered by an organization while implementing sustainability strategies. The literature emphasizes the consideration of five key elements, i.e., organizational decision-making, balancing the triple bottom line impacts, stakeholder engagement, lifecycle thinking, and a proactive approach. The literature emphasizes the significance of various decision-making levels and their interplay within an organization in the formulation and implementation of sustainability initiatives. The necessity for sustainability, according to Marcelino-Sádaba et al. (2015), challenges the project deliverable and the project delivery process and necessitates a lifecycle thinking approach to align with sustainability. The emphasis on sustainability necessitates a move away from monitoring time, cost, and quality and toward managing social, economic, and environmental factors. It is easier to manage an organization's impacts, but when it comes to projects, additional considerations are still not represented in practice. This necessitates a proactive strategy and client interaction. According to the research, the key driver of sustainability implementation is the willingness of clients to pay.

Although the literature provides an in-depth analysis of these elements, their application in practice, particularly for an EPC contractor in the process industry, is limited. Furthermore, while the Brundtland report gives a high-level definition of sustainability, it does not provide assistance on defining and operationalizing organizational-specific practices (Sroufe, 2017). This research meets this need by operationalizing and qualitatively measuring the utilization of these elements in implementing the EPC company's sustainability strategies. According to the literature study, organizations are confronted with difficulties in converting their strategy into action. This is also reflected in practice within the EPC company. This was done by identifying the barriers observed in practice within the EPC company to bridge the gap between strategic and operational levels. The study also provides a solution to overcome the barriers as well as a framework for translating strategy into action, bridging the gap between the strategic and operational levels. Thus, this research contributes to the existing body of literature by offering insights into the translation of goals from the strategic to the operational level. The study also focuses on acquiring data through practice, which adds the perspective of EPC contractors to the existing literature.

The empirical research findings exemplify the key points discussed in the literature and document review in practice. The results shows a variety of perceptions and the value of project managers in integration of sustainability in projects. The findings are divided into two parts. Semi-structured interviews structured into different topics (themes) are used to collect the necessary data. The first section of the findings highlights the results obtained by operationalizing the elements from the literature. The findings show that decision-making authority is higher at the strategic level than at the operational level. Integration occurs when sustainability is considered in decision-making and value creation. At the operational level, decisions are driven by client requirements, and if sustainability is not a requirement, the EPC company has less influence over decisions. Currently, the industry is driven by traditional project management constraints such as cost, quality, time, and safety, which continue to outweigh sustainability. At the strategic level, the EPC company complies with balancing the TBL impacts; however, on projects, the trade-off can only be made if it provides a cost advantage to the client. This contradicts the literature, which states that integrating sustainability into projects necessitates a shift in focus from managing time, money, and quality to managing social, environmental, and economic implications. The findings show that on projects, the economic aspect is the primary driver, with only compliance to environmental stewardship. The results obtained through operationalizing the elements thus adds value to the literature, as it provides a practice-oriented perspective on the consideration of elements.

In terms of proactive approach and client engagement, the EPC company's operational level exhibits a more reactive approach. The literature emphasized the importance of being more proactive in discussing the requirements for sustainability with the client (Marcelino-Sádaba et al., 2015; Wijethilake, 2017; Epstein & Buhovac, 2014) and raising awareness within the organization (Peenstra & Silvius, 2018; Fathalizadeh et al., 2021; Sroufe, 2017). In practice, the proactive approach is constrained by the client's requirements and the uncertain benefits of implementing sustainability practices. The findings show that on projects, the majority of decision-making is oriented toward short-term gains and less toward long-term sustainability goals. The findings also highlighted the need for EPC company to focus more on incorporating sustainability into decision-making and creating a culture that prioritizes sustainability. This is in line with the findings from the literature. The literature also emphasizes the need to develop a culture that proactively drives sustainability (Epstein & Buhovac, 2014). The literature states that exploring possibilities for integrating sustainability in projects requires a shift in project managers' mindset (Ershadi et al., 2021; Silvius et al., 2012; Silvius, 2018). This indicates that managers must be more proactive in engaging stakeholders in accomplishing sustainable goals. A contradictory viewpoint was observed in practice where a more reactive approach was seen within the EPC company. Within the EPC company environment, sustainability at the operational level is yet to get the momentum and is still dependent on the client's needs.

The second section of the findings presented the barriers to implementation, resulting in a gap between the strategic and operational levels. The findings show that, despite the development of guidelines, plans, and structure, putting those goals into action remains challenging. Barriers such as lack of push from top management, lack of performance measurement and reporting system, lack of motivation, and lack of industry specific guidelines, were also observed in practice. As a result, the empirical findings support the data studied in the literature review. The barriers identified are similar to those studied in literature and also specific to the EPC company. The barriers are divided into internal and external. Internal barriers influence corporate and business strategy, plans, and actions as well as sustainability performance, including TBL impacts, whereas external barriers limit organizations' attention to sustainability. The findings also presents the enablers identified from the practice. This contributes to the current literature by providing a holistic perspective on the barriers and enablers to sustainability implementation from the standpoint of an EPC contractor.

According to the data, more push and support from top management is needed to steer sustainability at the operational level and to create a mindset for considering sustainability in daily decision-making. According to the literature, the incorporation of sustainability in projects is dependent on the client's requirements as well as the assigned project manager. The empirical findings supports this statement, as it was seen that within the EPC company project managers play a key role in engaging with client as well as with top management. The project manager can influence the project decisions if there is a willingness towards integrating sustainability. The theoretical study shows that the scope of sustainability differ at each level of decision making and the outcome of sustainability varies according to the decision-making levels. The empirical findings revealed that sustainability remains an ambiguous concept for people, and unless a way to measure the project's sustainability performance is developed, it will remain a lower priority at the operational level. Moreover, a clear definition of sustainability and its associated vision are required to foster the incorporation of sustainability into organizational culture. This requires that the organization's leadership or top management be sufficiently motivated and capable of motivating others within the organization. While the use of measurement and reporting systems has been acknowledged in the literature and through interviews, developing the mindset and achieving a balance between top-down and bottom-up approaches is required. The human factors to sustainability implementation are critical because strategies cannot be successfully implemented at the operational level without motivated employees. Integration occurs only when people demonstrate positive engagement with the change and prioritize sustainability alongside other factors. According to the literature, project benefits should be prioritized in both the short and long term. This viewpoint, however, is frequently analyzed in terms of economic benefits obtained through sustainability and is frequently ignored when the sustainable objectives cannot be synthesized under financial benefits. It was discovered that clients and the EPC company are only interested in sustainability if it results in a cost advantage on projects.

The last phase of the research includes providing recommendations to overcome the barriers and developing a framework to enhance the implementation of sustainability and bridge the implementation gap. The research study is novel as it proposes solutions to bridge the strategic and operational level gap by translating strategy goals into actions. Furthermore, the proposed strategy combines the aspects studied in from the literature to the empirical findings of the research. The findings reveals that cost, quality, and time will remain the primary focus of any project however emphasis should be put on balancing the social, environmental, and economic impacts. Overall, the findings can also add value to other EPC companies in the industry and can also be adapted by organizations operating in other sectors such as infrastructure.

From a practical perspective, the research shed light on the aspects that the EPC company should focus on and a strategy to potentially integrate sustainability in projects. Currently, in the industry a lot of focus is on achieving sustainability targets from an organizational perspective. This includes reducing scope 1 and scope 2 emissions, recycling waste, reducing air travel for employees, using energy efficient lighting etc. On projects, the focus is mainly compliance with the regulations. Although the focus from an organizational perspective is important, it is also necessary to understand how sustainability can be integrated at the operational level. This study achieve this by developing a plan of action and identifying the barriers in the process. It is critical to understand the importance of barriers and develop appropriate mitigation strategies before developing any solution. This is accomplished by ranking the barriers in order of importance. Once these barriers are overcome, the EPC company can effectively integrate sustainability at the operational level using the proposed framework or through other requirements. The study demonstrates the significance of early client engagement in integrating sustainability and developing specific actions for projects in translating strategic level goals. As a result, the proposed framework takes both of these points into account and bridges the implementation gap by connecting the strategic and operational levels. The proposed framework includes

specific actions resulting from the operationalization of elements from the literature. The framework aligns various aspects of strategy formulation and implementation, allowing for a clear understanding of how implementation affects long-term corporate sustainability performance. The proposed solution will enable continuous improvement of sustainability strategies, provide insight into which actions yield the maximum value, and motivate people to consider sustainability as an important criterion.

6.2 Research Limitations

This section addresses the limitations of research:

- The scope of the research is limited to the perspective of an EPC company and its internal processes. The research does not consider the client's perspective, which may result in different findings, comparisons of different perspectives, and proposed solutions.
- The study focused on developing a framework for integrating sustainability at the operational level through qualitative research. Although the method yielded numerous insights, it has a limitation in that it cannot quantify sustainability measures. The research study did not include any quantitative analysis.
- Employees from the EPC company validated the framework and the proposed mitigating actions. If people outside the company or from the client's side had been included, the validation would have been stronger and resulted in a different outcome.
- The semi-structured interview selection criteria required interviewing highly experienced individuals. The interviews were conducted with people in positions of leadership and project managers with experience managing various projects. This did not allow for diversity in the experience of selected participants. Interviewing young professionals would have yielded a diverse range of perspectives on the research topic.
- The proposed framework has not been applied in practice or in any other conceptual circumstance. Although the focus group discussion allowed professionals to share their perspectives on the framework's applicability in practice, drawing conclusions is difficult until the framework is tested in practice.
- Although the barriers identified are the most commonly observed barriers in an organization, interviewing people outside the EPC company such as clients may result in the identification of additional barriers.
- This study relied only on semi-structured interviews for data gathering. Using a case study approach to analyze data from projects that have progressed beyond the early stages could have resulted in the collecting of project-related data and understanding how it influences the sustainability implementation.

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CHAPTER 7: CONCLUSION & RECOMMENDATIONS

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CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

This chapter of the research presents the study's final conclusions. The section (7.1) addresses the main research question as well as the sub-research questions that follow. The chapter also includes recommendations for practice as well as future research in section (7.2).

7.1 Answering the Sub-Questions and the Main Research Question

SQ1: What elements should organizations consider while implementing sustainability strategies?

This sub-question was addressed during research phase one through literature review. Following a review of the literature, the concept of sustainability was investigated in general as well as in the context of corporate organization. Following the keyword search, relevant literature was studied to investigate the elements essential for implementing sustainability strategies. Organizational decision-making levels, balancing the social, environmental, and economic impacts, lifecycle thinking, stakeholder engagement, and a proactive approach were recognized as five key elements. The organizational decision-making levels have varying degrees of impact over incorporating sustainability into projects. The strategic level is concerned with the formation of strategic goals and objectives, whilst the operational level allows for the minimization of the project's social, environmental, and economic repercussions. According to the literature, in order to implement sustainability strategies, a transition from managing traditional project constraints to managing social, economic, and environmental issues in project decisions is required. In addition to this, the literature discusses the level of proactiveness required for organizations to go from reactive to proactive. A reactive strategy is concerned with satisfying regulatory compliance (requirements), whereas a proactive approach is concerned with going above and beyond compliance to achieve greater impact. It also necessitates that organizations address not only the project lifecycle, but also the lifecycle of the resources used and the impacts of the process of managing and delivering projects. Integrating sustainability involves numerous stakeholders; nevertheless, given the nature of the process industry, the client is in the driving seat for setting project requirements. As a result, proactive engagement with clients is required for integrating sustainability at the operational level.

SQ2: How do the company's strategic goals for sustainability relate to the objectives at the project level?

This sub-question was addressed during research phase one through document review. The document review was done by reviewing the EPC company's external and internal documents regarding sustainability. A similar process like the literature review was used to refine and identify relevant documents to be further used for the study. Several documents were reviewed that contained information about the organizational strategic goals, processes at operational level, performance, guidelines, and practices. It was concluded that the company's performance at the strategic (organizational) level is driven by the principle of triple bottom line whereas at the operational (project) level economic dimension is the main factor. The company have also established a sustainability committee at both the corporate and individual office levels. These committees are in charge of organizational and project-level sustainability action. Several project-specific guidelines and processes have been developed. However, little evidence has been found of the implementation of these guidelines on projects. It also highlighted the need to improve the communication of these strategies and increase awareness among the people. The consideration of these soft parameters is

critical in driving the changes towards sustainability. Sustainability is not yet a project driver for the company as no data was found with regards to implementation of sustainability. Although the tools like screening tools and workshops provide an opportunity to identify project specific actions the implementation is not yet a mandatory requirement on projects, it's all voluntary. This approach is restricted by the clients requirements and is considered least important on projects. The document review showcases that there exists a gap between strategic and operational level. The document review also emphasized the integration of elements examined in the literature into the company's strategies, but the use of these elements in practice is further delineated through semi-structured interviews.

SQ3: What barriers contribute to the gap between strategic goals and its implementation at the operational level?

This sub-question was addressed during research phase two through semi-structured interviews. The purpose of semi-structured interviews is two-fold i.e., to highlight different elements and its consideration in the implementation of sustainability strategy and to identify the barriers affecting the implementation of sustainability, resulting in gap between strategic and operational level. It was concluded that the push regarding sustainability is lacking within the EPC company and a more proactive approach is needed at the operational level. It is difficult to achieve the balance between social, economic, and environmental impacts at the operational level if there is only compliance and not the drive to go over and beyond. A total of 13 interviews resulted in the identification of 20 barriers. The barriers are categorized as internal and external. The barriers are related to not only the organizational structure and practices but also to managerial and human factors. The barriers identified are: lack of push from top management, sustainability is not seen as project driver, lack of performance measurement and reporting system, sustainability is given lower priority, people's mindset, practices are less practical and tangible, focus is more towards short term gains, sustainability is not a business driver, lack of business case for sustainability, financial benefits of implementing sustainability are unknown, sustainability is considered as cost, affordability of sustainable investments, no additional time for discovering sustainable options, involvement after FEED phase, sustainability is seen as an additional task, not in clients requirements, industry specific guidelines, traditional approach, proposals are selected based on cost competitiveness, and lack of incentive. Among the barriers identified, lack of push from top management, not in clients requirements, people's mindset, lack of performance measurement and reporting system, sustainability is not seen as a project driver, and sustainability is given a lower priority are the most significant and frequently mentioned barriers by the interviewees. The combination of internal and external barriers affects the implementation of sustainability and results in a gap between the strategic and operational level.

SQ4: How can a sustainability framework be developed to enhance the implementation of sustainability at the operational level and bridge the implementation gap?

This sub-question was addressed during research phase three through framework development. This involved development of framework for implementation of sustainability and bridging the strategic and operational levels. Firstly, the barriers identified from the semi-structured interviews were prioritized based on their likelihood of occurrence and the impact. A prioritization score is derived for each barrier before providing the mitigation measures. The prioritization is done so that the EPC company can understand which barriers has the most impact and are important to tackle. To provide the mitigating actions the barriers are grouped into four categories i.e., structural, human, service-oriented, and external irrespective of whether

they are internal or external barriers. This is done to get a better handle of the barriers as they are interrelated, and a mitigating action can help overcome a few barriers. Mitigation measures are then provided to overcome the barriers. The proposed framework is then developed considering all the aspects studied in this research and connecting them to form a flow of translating strategy into action. The framework is divided into different categories i.e., strategy, project planning, project operations, outcome, and long-term results. The project planning includes the elements studied from the interviews, strategies, plans, programs studied through the document review, and barriers from the interviews. These results lead to the formulation of sustainability actions that will be undertaken in order to monitor sustainability performance. The performance of each action can be measured by constructing a set of indicators. The indicators will help in evaluating the operational effectiveness of those actions, as well as understanding how one action influences another until long-term sustainable performance is attained. The project results and evaluation aid in reviewing performance and identifying areas for improvement in strategic plans and goals. This phase also includes the development of a business case and the documentation of lessons learned, which should be utilized internally to promote sustainability and externally to engage clients. These categories culminate in long-term sustainability performance and the management of corporate social, environmental, and economic impacts. The framework is designed in such a way that the strategic level goals cascade down through the organization, assisting in translating the strategy into action. the framework will enable continuous improvement of sustainability strategies, provide insight into which actions yield the maximum value, and motivate people to consider sustainability as an important criterion. The framework guides the company and project managers in proactively integrating sustainability at the operational level, ultimately improving project sustainability performance and long-term corporate, social, and environmental performance.

MRQ: **How can EPC contractors operating in the process industry pro-actively integrate strategic sustainability objectives into the operational level of their organization?**

The sub-questions addressed during the investigation are used to answer the main research topic. The major goal was to study the implementation process and develop a framework that the EPC company could use to incorporate sustainability at the operational level and bridge the implementation gap. It was observed that organizations encounter difficulties in developing a culture of sustainability and in converting their strategy goals into action on projects. In order to implement sustainability at the operational level, managers must also understand the impact of their decisions and the steps they may take to improve sustainability performance. This was addressed by developing a framework that signifies the translation of strategy into action via step-by-step methods. The proposed framework assists the organization in identifying actions that can contribute the most value and in linking strategy goals to operational (project) objectives. To develop a framework and put it into practice, it is necessary to first understand the requirements as well as the barriers to sustainability implementation. As a result, this aided in identifying the barriers that should be the primary focus of the organization, and the proposed mitigating actions will assist in overcoming those barriers. The proposed framework bridges the gap by collecting the required knowledge and results at the operational level and providing input to the strategy at the strategic level. This loop aids in the continual improvement of strategic goals and plans, improving sustainability integration, and challenging managerial decisions. It aids in providing a clear understanding of the consequences of decisions and to explain the benefits of implementing sustainability both internally and with clients. The framework and proposed mitigating actions can be used to shift from a reactive to a proactive approach, as well as to engage clients in developing project-specific actions that could result in high sustainable performance. The framework will not only aid in the improvement of strategic plans and decisions, but it will also spark discussion within the project team about

the sustainability performance of various projects, ultimately fostering an environment in which sustainability is regarded as an important criterion. The proposed mitigating actions can help drive sustainability within the company and raise awareness. Top management can use it to communicate strategies and action plans throughout the organization by exercising leadership in making sustainability a central topic of their strategy. Despite the fact that the company has external constraint in the form of client, the focus should be on discussing sustainability and developing actions that can lead to a sustainable outcome.

7.2 Recommendations

Based on the findings of the research, the following recommendations are made to the company (practice) and the literature (future research).

7.2.1 Recommendations for the company

Fluor is a large EPC company with a competitive market position. Fluor's operations have a large influence on society and the environment, necessitating impact minimization through the implementation of sustainability. Although Fluor is not a project owner, it is critical that the company adopt the notion of sustainability at the operational level and be proactive in engaging with clients to enhance sustainability implementation. Chapter 5 can also be viewed as recommendations for the EPC company in terms of incorporating sustainability into projects.

- Understanding that developing a sustainable culture inside the organization takes time and requires the collaboration of all employees, not just management. It is critical to strike the proper balance between top-down and bottom-up approaches. A strong commitment and push from senior leadership is required to create a drive where sustainability is a top priority; nevertheless, managers at the operational level must take responsibility for clearly communicating the strategic goals within the project team and engaging clients. Creating a feedback loop between these two levels will also aid in the start of discussions and ways to enhance the organization's approach to sustainability. It will provide input and feedback on whether systems and mechanisms are insufficient or lacking, as well as what is needed to improve the efficiency and success of sustainability integration.
- It is critical that sustainability is considered a central topic within the organization and not a window dressing criteria. This can begin by concentrating on little incremental steps. It is vital that the words be put into action. Instead of merging it with safety, sustainability should be regarded as a separate topic. This can be accomplished by including sustainability sections in project review meetings that emphasize the importance of sustainability. As the theme of safety is not jeopardized in any way, neither should the topic of sustainability. Over time, this will raise the importance of sustainability. Instead of assigning it to the HSE manager or project manager, make the position of sustainability coordinator an official project position. Assigning someone only to address sustainability as part of the project decision-making process could assist stimulate the change. If the corporation wishes to successfully execute change inside the organization, it is vital that sustainability be considered in the same manner as other variables such as cost, quality, time, and safety.
- It is critical to educate and raise awareness inside the organization. This can be accomplished through internal workshops within departments, project teams, and cross-department collaboration to share dialogue and ideas about integrating sustainability. Organizing these events on a monthly basis will promote discussion and lead to the creation of new ideas. This can also be used to communicate project progress and give people learning opportunities through examples. This will improve people's ability to

advise clients and demonstrate the benefits of sustainability (economic value) to clients. The top management and sustainability team should be in charge of driving these sessions and raising awareness.

- Creating a project measurement or reporting system. The development of performance measurement tools such as scorecards, evaluation criteria, and checklists will aid in monitoring project sustainability performance. This can include a number of key performance indicators (KPIs) against which the project is assessed. This is where the recommended framework of this research can be useful to the company. KPIs can also be created in collaboration with clients to focus on project-specific requirements. This will aid in determining which KPIs to employ, when, and how. Additionally, using these checklists will help track the benefits in terms of cost. This will assist project teams in reassessing the criteria in order to increase the value of sustainability.
- The organization must be proactive in engaging clients in discussions about sustainability. Simply responding to the needs of the client will impede the adoption of sustainability in projects. Proactively conveying the vision and benefits of sustainability will help to give a consistent image of stakeholder interests and intents. Early in the project, preferably during the proposal process, the organization should engage with the clients and make sustainability a serious topic of conversation. The EPC company should not wait for the client to bring up the topic of sustainability; rather, it should be standard practice in proposals provided to clients. It should be the company's responsibility to initiate dialogues with clients.
- Making sustainability a common topic of discussion in all negotiations and decision-making conversations. Making sustainability a common point of discussion in addition to the standard project factors such as budget, schedule, and project needs. This will raise awareness and aid understanding of the visions involved. Making it a standard would help shift the idea that it is expensive and takes up too much time. The senior management can also incorporate incentives in the form of rewards or recognition for the people working on the projects for their efforts in implementing sustainability. This will create a desire to think not only in terms of money, but also in terms of decreasing social and environmental repercussions.

Among the recommendations provided, a few can be easy first steps that can be taken to accelerate the momentum towards sustainability. A potential step that the EPC company can take towards client is to include sustainability as a mandatory topic in project proposals and involve the sustainability team in the proposal phase for discussion with clients. Within the EPC company itself, a potential first step is having the top management to push sustainability in decision-making and project status review meetings. Additionally, internal discussions within departments or cross departmental discussions should be conducted more frequently to brainstorm ideas and discuss possible opportunities for integrating sustainability in projects.

7.2.2 Recommendations for the industry

This section provides recommendations for the industry as a whole.

- Organizations should take a top down and bottom-up approach towards this change with strong leadership commitment.
- Critically examine your organizations progress towards sustainability and prioritize activities to reduce the potential gap.
- Making sustainability a project success criterion, so that it is considered in decision-making even if the client does not ask for it.
- The emphasis should be placed on not only realizing sustainable projects, but also on making the delivery and execution of such projects sustainable.

- Give sustainability the same weight as other factors such as safety and treat sustainability as a separate topic rather than combining it with safety.
- Encourage the shift in mindset from reacting to requirements to questioning the clients' ultimate goal in order to pursue an effective approach.

7.2.3 Recommendations for Future Research

The recommendations for future research are as follows:

- The next step could be to further study the proposed framework through quantitative research by developing KPIs and appropriate measurement system. Identifying the relevant KPIs will help in understanding the impacts of the actions and what KPIs should be prioritized to limits those impacts. The research can focus on developing a checklist for the projects.
- Future research can also take into account the client perspective. The research can focus on understanding the client requirements and how it affects the implementation. A framework can then be developed by including the client requirements.
- Future research can also explore the role of human factors in implementation of sustainability. This can be done by researching what knowledge and competencies are required by a project manager at the operational level.
- Future research can also focus on the developing a business case research for sustainability. An exploratory research can be performed to understand the benefits of implementing sustainability in terms of financial value and how sustainability can result in cost advantage.

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CHAPTER 9: APPENDICES

Appendix A: Literature Review

The following steps were taken to find relevant literature from various sources to answer the study's sub-questions. Kordi et al. (2021), describes the process of systematically reviewing and analyzing the academic literature to answer the corresponding research question. The following steps are used to identify relevant literature to answer the sub-question 1-

1. Identification-

The necessary information was obtained from scientific sources such as journals, websites, and books, among others. To find scholarly articles, books, and reports, researcher used the online library databases Google Scholar, Scopus, Science Direct, and Wiley. This was accomplished by using a combination of key terms or keywords. The keywords were chosen based on their relevance to the research questions. The literature review was used to address sub-question 1 in this study. Sustainability integration, project management, decision-making, implementation, organizations, and sustainability strategy are the core keywords utilized to answer sub-question 1. Boolean operators such as 'OR' and 'AND' were used to include two or more keywords in the search.

2. Screening-

The material was then categorized according to its relevance to the study. This screening was carried out in accordance with the established inclusion criteria. The inclusion criteria include journal and paper publications in English, as well as articles on topics such as sustainability, organization, implementation, and project management. In addition, papers addressing the oil and gas sector or the process industry were chosen. However, the number of publications connected to these industries is low. In addition, the inclusion criterion included a review of previously published works on the subject. The articles published between 2013 and 2022 were given top consideration.

3. Eligibility-

This procedure includes manual monitoring of the retrieved articles to ensure that all of them met the criteria. Only articles that explicitly addressed the topic were investigated afterwards to answer the sub-question. Publications that were cited less than 5 times were eliminated from the study to retain the quality of the articles analyzed.

4. Inclusion-

Because the study focuses on the strategic and operational (project) levels, other aspects of sustainability such as procurement and tactical level were left out. To address sub-question 1, the text of the obtained papers was examined in order to determine the most important elements involved in the integration of sustainability. The elements that appeared the most frequently were identified and chosen to answer sub-question 1. A few parts

with comparable conclusions were combined together to form an element that summarized the common ground of the articles' topic and perspective. The elements are addressed either explicitly or in a larger context in the publications. Only the article dealing with the incorporation of sustainability into project context was examined. The majority of the studies examined the relevance of decision-making inside companies and projects, while some looked into the triple bottom line and life cycle thinking. Other studies have taken into account the stakeholders' point of view, which is critical in project management and is present throughout the project life cycle. Transparency, communication, accountability, reactive, and proactive involvement were also identified in the papers and classified as proactive. These specific elements were chosen based on the issues and arguments encountered during the full-text examination of the publications under consideration.

The table below lists the paper analyzed for the elements identified.

Literature Review			Elements				
Author	**Journal/Book**	**Year**	**Decision-Making**	**Balancing Triple Bottom Line**	**Stakeholder Engagement**	**Life Cycle Thinking**	**Proactive Approach**
Aarseth	International journal of project management	2017			✓		
Afzal et al.	Procedia engineering	2017	✓	✓			
Armenia et al.	MDPI- Sustainability	2019	✓	✓	✓	✓	✓
Carvalho & Rabechini	International journal of project management	2017	✓	✓		✓	
Chofreh & Goni	Sustainable development	2017	✓				
Engert & Baumgartner	Journal of cleaner production	2016	✓		✓		✓
Epstein & Buhovac	Routledge	2018	✓	✓	✓	✓	✓
Epstein & Roy	Long range planning	2001	✓		✓		
Eskerod & Huemann	International journal of managing projects in business	2013	✓		✓		
Labuschagne & Brent	International journal of project management	2005		✓	✓	✓	
Larsson & Larsson	MDPI- Sustainability	2020	✓	✓	✓	✓	✓
Machado et al.	International journal of production economics	2017	✓	✓	✓	✓	✓
Marcelino-Sádaba et al	Journal of cleaner production	2015		✓	✓	✓	✓
Martens & Carvalho	Journal of cleaner production	2016		✓			

McPhee & Dias	Wiley	2020	✓	✓	✓	✓	✓
Pajunen et al.	International journal of sustainable engineering	2016	✓				
Sabini et al.	International journal of project management	2019	✓	✓	✓	✓	✓
Sánchez	Journal of cleaner production	2015		✓		✓	
Shen et al.	Journal of civil engineering and management	2017		✓		✓	
Silvius	NAP- Process industry network	2018	✓	✓	✓	✓	✓
Silvius & Marnewick	Procedia computer science	2022	✓	✓			
Silvius & Schipper	Social Business	2014	✓	✓	✓		
Silvius & Schipper	International journal of information systems and project management	2016	✓	✓	✓	✓	✓
Silvius et al.	International journal of project management	2017	✓	✓	✓		✓
Silvius et al.	Gower publishing	2012	✓	✓	✓	✓	✓
Sroufe	Journal of cleaner production	2017	✓	✓	✓		✓
Wijethilake	Journal of environmental management	2017	✓				✓
Willard	University of Toronto	2005	✓	✓			✓

Appendix B: Details of Document Studied

The following section describes the steps taken to find the relevant information through document search within the case company. This section of the research answered the sub-question 2. The document review was carried out using the same steps as the literature review.

1. Identification-

The search was conducted within the company database "OneFluor," where all of the guidelines, practices, and procedures, among other things, are available under the knowledge online communities. Documents from the knowledge online community- sustainability and project management- were used for this investigation. Because the primary goal was to examine the company's sustainability procedures, only 'sustainability' was used as the primary keyword or search term..

2. Screening-

Because the documents underwent several revisions, only the most recent revisions were considered in this research.

3. Eligibility-

In this study, only documents prepared at the corporate level and the Amsterdam office were used.

4. Inclusion-

The goal was to examine the approaches to sustainability at the strategic and operational levels. As a result, the procedures employed at these two levels were scrutinized. All of the practices created for the projects were used at the operational level.

The table below provides the details of the document studied.

EXTERNAL DOCUMENTS	
2021 Sustainability Report	This report highlights Fluor's efforts towards achieving the sustainable ambitions such as Net zero 2023, society, and environmental stewardship. The document also illustrates how Fluor helps its clients meet their sustainability goals and next steps in sustainability journey.
2022 Fluor Sustainability Policy	The document discusses Fluor's commitment towards sustainability such as helping client meet energy conservation, committing to climate action, recycling & waste reduction, water conservation etc.
Sustainability report- Data Disclosure	Provides data reported on economic, environmental, and social sustainability initiatives according to GRI standards.
Net Zero 2023 Progress Report- Q2 2022	Shows progress towards Net zero 2023, eliminating operational scope 1 and scope 2 GHG emissions.

2021 Sustainability Progress at Glance	Shows progress in areas such as society, DE &I, health & safety, energy transition, environmental, and supply chain.
INTERNAL DOCUMENTS	
Sustainability Guidelines	Provide understanding of sustainability/TBL, importance of sustainability for Fluor's business, information on sustainability standards, and contact information for sustainability organizations and rating systems
Sustainability Value Improving Workshop	Shows standard method of implementing VIP program on project. Provide detailed guidance on the process of preparation and execution of sustainability workshop.
Sustainability Resources at Fluor	Provides information on the resources available at Fluor such as, practices, guidelines, communities, knowledge base, tools, and contact information of subject experts.
Sustainability Proposal Write-up	This document discusses the sustainability mission of Fluor and how Fluor together with the clients, can help achieve their sustainability ambitions.
Sustainability Activities on Project	The purpose of this document is to provide guideline to implement sustainability program in offices and projects. Assists employees in practicing sustainability.
Project Management Manual	Describes Fluor's project management philosophy, methods and elements needed to successfully execute projects. Designed as a textbook to guide project managers.
Standard Project Procedure Manual	This manual is a part of Fluor operating system as a reference manual. This can be used as a reference to project execution procedures.
Client Alignment Process	This document describes the requirements for the client alignment process to be used on all projects. The client alignment process is intended to facilitate agreement between Fluor and its client regarding project objectives, strategies, roles and responsibilities, CSFs, and KRAs.
Operating System Requirements	The document defines Fluor's required methods of operation and the application of work processes, practices, systems, and activities for projects that promote excellence in execution and client satisfaction. The operating system requirements (OSR) are the fundament of Fluor's ISO 9001-2000 certified Quality Management System.

Sustainability Performance Tool (SPIMS)	This document is an overview of a Fluor tool which can be used to manage sustainability indicators for Fluor office facilities and project sites globally.
Sustainability Awareness Survey	Survey about employee commuting & sustainability awareness. The data includes personal commitment towards Fluor's sustainability goals, sustainability performance, and employee feedback towards it.
Project Sustainability Goals	This document reflects on sustainability efforts in project execution in 2021 and discusses future goals for the coming years.

Appendix C: Semi-structured interview set up

The following set-up and questions were prepared for the project managers' interviews. For the interviews with top management, a few questions were changed and/or removed.

No. of Interview	#	
Date		
Interviewer	Aditya Navandar	Aditya.Navandar@fluor.com A.Navandar@student.tudelft.nl
Interviewee		

I would like to thank you in advance for your time and contribution to my research!

Part 1: Introduction

1. Introducing myself
   - Master CME student at TU Delft; originating from Pune, India with a background in Civil engineering
2. Introduction of the interviewee
   - Background and role within the company/project
   - Years of experience
   - Expertise and areas of interest
3. Confidentiality and use of data
   - Signing the informed consent form prior to the interview.
   - Anonymity of the information provided will be ensured/Information will not be traceable back to the interviewees.
   - Permission to record the interview (video or audio)- to transcribe the information provided for data analysis. The transcript will not be shared without consent.
   - The interview transcript will be sent to the interviewees for verification.

Part 2: Main Interview

1. General Questions
   - Are you aware of Fluor's sustainability goals? If yes, which sustainability goals can you mention? If not, why?
   - To what extent do you think there is a clear sustainability strategy in each project?
2. Project (in general)
   - What are the success evaluation criteria of the project?
   - Have you implemented sustainability program/value improving workshop in your project as indicated in Fluor's sustainability practices (000.653.8500)? If not, why?
3. Decision-making regarding sustainability
   - How was/has sustainability been addressed within the project?
   - Has the consideration of sustainability in projects changed the decisions regarding management of projects?
   - Who are involved in these decision-making moments?
   - Was there a clear implementation plan on sustainability to apply throughout the project? If yes, how was this implemented? If not, why?

- Within Fluor, how is sustainability being treated at different decision-making levels? (Strategic/tactical/operational)

4. Project managers perspective
   - What are your thoughts on Fluor's sustainability strategies, guidelines, and tools?
   - According to you, what are the main success factors for implementing sustainability in projects?
   - What aspects do you think you can influence in your position when it comes to decisions regarding sustainability?
5. Balancing social, environmental, and economic impacts
   - How is the balance between the three pillars of sustainability achieved? What kind of trade-offs are made to achieve this balance?
   - Which out of these is considered the main driving factor for projects?
   - The triple constraint variables dominate project decision making. How does the purpose of achieving a balance between the three pillars of sustainability influence decisions?
   - Do you think Fluor's strategic direction w.r.t the three dimensions of sustainability is followed through in practice?
   - Do you assess project progress w.r.t these dimensions? If so, how?
6. Stakeholder Engagement
   - In the client alignment process, was there any discussion regarding sustainability? If not, why?
   - What is the influence of client over the decision-making regarding sustainability and does Fluor try to influence the client in implementing sustainability in projects? If not, why? If so, how?
7. Proactive approach
   - What is your opinion about the approach taken at the operational level regarding sustainability? Is it a reactive or proactive approach?
   - From the literature review it was observed that a more reactive approach is taken when integrating sustainability into projects (Compare with cost, time, quality, and safety). What is your view on this, and do you think this resonates in practice?
   - According to this figure and its explanation, where does Fluor stand in organizational and project perspective?
   - What can be done to move from reactive to proactive sustainability approach?
   - Within Fluor, what kind of difference do you see in the level of proactiveness regarding sustainability at strategic level and at operational level? And why?
8. Life cycle thinking
   - How is sustainability addressed throughout the project lifecycle?
   - What kind of tools/methods are used for effective management of resources?
   - What kind of metrics or plans are implemented to monitor sustainability performance throughout the project lifecycle? If so, how?
9. Factors affecting the implementation of sustainability
   - What are the barriers/factors affecting the implementation of sustainability at the operational level?
   - How do these factors affect the implementation of sustainability?
   - According to you, what reasons contribute to the gap between strategy formulation and its implementation at the operational level?
10. Recommendations
    - What are the key recommendations to overcome the mentioned barriers?
    - How do you think the strategic and operational level gap can be bridged?
    - Is there a way to improve the implementation of sustainability in projects? Following up, what are the requirements for such methods?

- Where do you think improvement regarding sustainability is needed within Fluor's strategies?

11. Closing
    - Are there any additional aspects of sustainability that we have not discussed?
    - Looking back at the project phase, would you have made different decisions when it comes to sustainability?
    - Any recommendations for me in approaching other interviews and for my research?

Possibility to ask questions later.

Appendix D: Coding data from Atlas.ti

For confidentiality reasons, the data has been excluded from the repository