University of Stavanger

FACULTY OF SCIENCE AND TECHNOLOGY

MASTER THESIS

Study programme: Industrial Asset Management	The spring semester, 2023 Open
Author: Georg Bårdsen	Georg Bårdsen (Signature author)
Supervisors: Internal supervisor: Jawad Raza External Supervisor: Vigdis Bringedal Holst	
Thesis title: "Asset Partner" Service model – Challenges and Opportunities for service industry. - A case from Norwegian Continental Shelf (NCS)	
Credits (ECTS): 30	
Keywords: Asset Management Asset Partner Norwegian Continental Shelf O&G Company Oil service Company Operation Management Operator Company Outsourcing Service model Trade union	Pages: 84 + appendix: 3 Stavanger, 15.06.2023

"Asset Partner" Service model – Challenges and Opportunities for service industry

- A case from Norwegian Continental Shelf (NCS)

By

Georg Bårdsen

Thesis is submitted to the Faculty of Science and Technology
University of Stavanger

In Fulfillment of the Requirements for the degree of
Master of Science (MSc) in Industrial Asset Management

FACULTY OF SCIENCE AND TECHNOLOGY
University of Stavanger
Year 2023

Abstract

The oil and gas (O&G) industry is facing numerous challenges, including fluctuating oil prices, increasing regulatory pressures, and a growing demand for cleaner energy sources. To remain competitive and maximize value creation, companies must adopt customized and flexible approaches to their offshore operations and think of new solutions to solve tomorrow's challenges [1].

Examining the concept and implications of an Asset Partner reveals various opportunities and challenges for both operator- and service companies. In recent years, operational partnerships have emerged as a strategic solution for companies aiming to optimize their operations, minimize risks, and enhance their competitive edge.

The Norwegian Continental Shelf (NCS) presents a unique operating environment, combining harsh climatic conditions, advanced technologies, and stringent safety and environmental standards. Operating in this challenging environment requires specialized knowledge, strong regulatory compliance, and a commitment to sustainable practices. By forming alliances with third-party service providers, O&G companies can leverage external expertise, share risks, and pool resources to achieve common objectives [2].

While partnerships offer several benefits, there are also notable challenges in the collaboration between operator companies and oil service companies on the NCS. This thesis will examine various perspectives, including those of operator companies that typically manage their assets independently, as well as the viewpoints of oil service companies, trade unions, and governmental authorities.

The thesis aims to investigate the following research questions:

1. What are the benefits and challenges of implementing an "Asset Partner" model in the Oil and Gas (O&G) industry, and how can it be used to increase competitiveness in the market?
2. How do regulations and authorities, such as the Petroleum Safety Authority (PSA) impact the implementation and success of the "Asset Partner" model in the O&G industry?
3. How does the "Asset Partner" model compare to traditional contractor and partnership models such as Technical Service Provider (TSP) model.
4. What are the specific business models and strategies that can be used to effectively implement the "Asset Partner" model in the O&G industry?

A case study was conducted, involving data collection through interviews with professionals representing various roles in the industry. These included individuals from operator companies, oil service companies, trade unions, and government or regulatory authorities.

The insights gathered from their responses have served as the base for addressing the research questions.

The study reveals the complications and aspects related to the Asset Partner model. It provides a comprehensive understanding of the opportunities, challenges, and potential future implications of this model from the perspectives of operator companies, trade unions, oil service companies, and governmental authorities.

It reveals that the Asset Partner model in the O&G industry offers the potential of significant benefits, including increased efficiency, cost savings, and access to specialized resources I terms of competence and capacity. However, challenges such as the loss of control over critical activities and potential erosion of core competencies must be carefully managed. The green transition and technological advancements can also have an impact in the future of the Asset Partner model in the future, emphasizing the need for regulatory adjustments for its sustainable implementation and alignment with environmental goals.

To effectively implement the Asset Partner model, clear contractual agreements, open communication, performance monitoring, risk management, and competence development are essential. The research suggests a need for further research and collaboration among stakeholders to develop best practices, guidelines, and regulatory frameworks for the successful operation of the Asset Partner model in the O&G industry.

Acknowledgements

The thesis was written as a finalization of the master program Industrial Asset Management from the University of Stavanger. The thesis was written in collaboration with the oil service company Moreld Apply.

In this section, I would like to express my sincere appreciation to those who played a vital role in guiding, supporting, and assisting me throughout the development of this thesis.

First, I want to express my gratitude to my internal supervisor, Jawad Raza. His constant guidance and support, both academically and practically, has been essential in my journey. With a wealth of knowledge from the oil and gas industry, his feedback has been valuable. I deeply appreciate his involvement, the ideas he has shared, and our constructive discussions. His involvement was essential, starting with the selection and development of the thesis topic and continuing until its successful completion.

Next, I'd like to express my appreciation to Moreld Apply for presenting me with an intriguing case of the Asset Partner model. Vigdis Holst Bringedal, my external advisor, has been central in guiding and supporting me, with her extensive knowledge in the oil and gas sector. Her assistance was invaluable, not only during the data collection stage, but also throughout the entire journey of my thesis.

Finally, I wish to express my deep gratitude to my family and friends. Their encouragement, support, and help during the completion of this thesis has been valuable. Not only have they been there for me through this research journey, but they have also consistently uplifted me throughout my academic career.

Georg Bårdsen

Stavanger, 15.06.2023

Table of contents

List of figures

List of tables

List of appendixes

List of abbreviations

CAPEX	Capital expenditures
CCS	Carbon capture and storage
CO2	Carbon dioxide
COMAH	Control of Major Accident Hazards
E&P	Exploration and Production
FEED	Front End Engineering Design
HLV	Heavy Lift Vessel
HSE	Health, Safety and Environment
HSEQ	Health, Safety, Environment and Quality
IEA	The International Energy Agency
KPI	Key Performance Indicator
NCS	Norwegian Continental Shelf
NPD	The Norwegian Petroleum Directorate
NSD	Norwegian Centre of Research Data
O&G	O&G
OPEC	Organization of the Petroleum Exporting Countries
OPEX	Operational expenditures
PDCA	Plan-Do-Check-Act
PSA	Petroleum Safety Authority Norway
TQM	Total Quality Management
TSP	Technical Service Provider
UK	United Kingdom

1 Introduction

This chapter serves as an introduction to the challenges and opportunities associated with the "Asset Partner" service model in the Oil and Gas (O&G) industry, focusing mainly on the Norwegian Continental Shelf (NCS). With collaboration and strategic partnerships being crucial for maintaining competitiveness in an industry facing increasing competition, risks, market instability, and economic fluctuations, the "Asset Partner" model seeks to offer potential benefits for both operating companies and service providers.

The thesis investigates the implementation of this model within the NCS, its impact on operator companies, service providers, and trade unions, and the role of regulations and authorities in the success of the "Asset Partner" model. By conducting a literature survey, analysis of regulations and authorities, and market analysis, this research aims to provide valuable insights into the practicality and potential advantages of the "Asset Partner" model in the O&G industry. It will also investigate the more challenging parts of it.

1.1 Topic background

The O&G industry has long acknowledged the advantages of collaboration and strategic partnerships, including performance-driven relationships, collaborative contracting, and various forms of alliancing. In terms of turnover, service and supply sector is the second-largest industry in Norway, just behind the sale of O&G. In this sector, there are approximately 2000 companies in the whole value chain that are working on the NCS and have some sort of collaboration with the different operators. Trough collaboration on the NCS, Norway has become one of the leading O&G nations in the world [3].

Collaborations on the NCS encompass a wide range of activities, from the initial exploration phase to the decommissioning of offshore operations. These collaborations include partnerships with companies specializing in seismic surveys, data processing, and geological and geophysical services, as well as drilling and well-services. Upon making a discovery, engineering teams are engaged to design and implement appropriate platform solutions, and construction teams are responsible for the building and offshore design of the necessary equipment. Ongoing operation and maintenance of the offshore production is also a key aspect of these collaborations, as well as the eventual removal and decommissioning of the offshore installations [3].

As industry faces increasing competition, risk, market instability, global threats, and economic fluctuations, it is crucial for companies to think innovatively to maintain their competitive advantages. On NCS over the last years it has been a clear change in the portfolio of companies, from only 6-7 of the largest companies in the world to operate on NCS, to a more variated group of both large and smaller companies. Figure 1 is an illustration of the spread of companies on NCS [4].

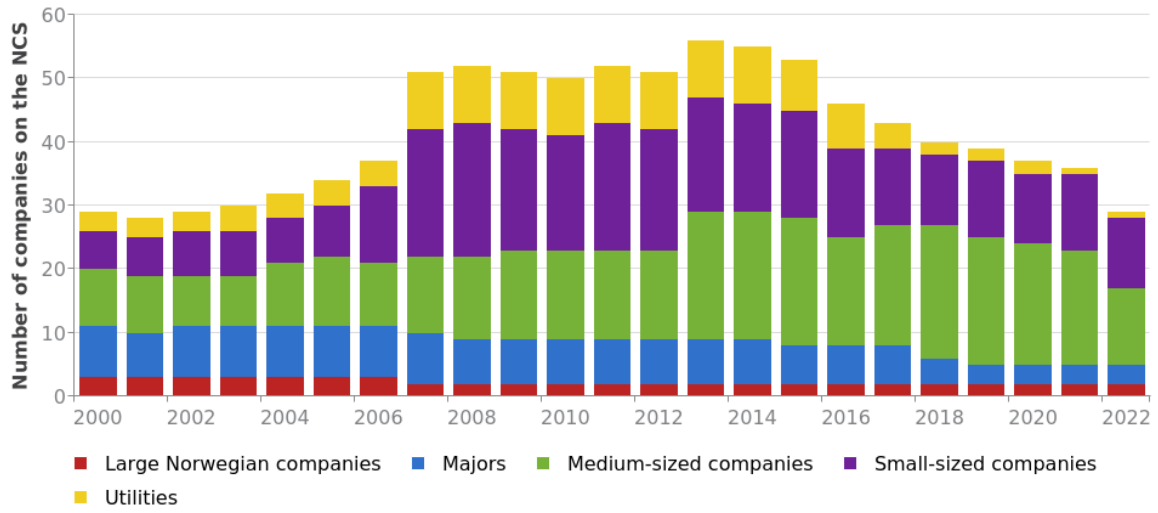

***Figure 1**: Operators on NCS over the years [4].*

This thesis will explore the concept and strategy of the "Asset Partner" model, both nationally and internationally, to determine if such a model can be implemented into NCS. It will also investigate how a service provider can modify its business model to become an "Asset Partner" to meet the required competence and capacity demands of the customer. Additionally, the thesis will examine the regulations and authorities that may affect the partnership, as well as the challenges of sustainability, profitability, risk, competency, and customer requirements. Another factor is the trade unions which represent the employees, and how this model would affect them.

By conducting a literature review, examining regulations and authorities, and performing market analysis through interviews with various stakeholders in this model, the thesis aims to offer insights into the implementation and optimization of this model for the mutual benefit of operating companies and service providers.

1.2 State of the art and Research Gaps

The main objective of this work is to investigate and explore the challenges and opportunities of implementing an Asset Partner model in the O&G industry, with a specific focus on the NCS. The addressed problem of forming a partnership between operator companies and oil service companies is indeed interesting due to its potential impact on the competitiveness and operational efficiency of the industry.

The theoretical relevance of this work lies in contributing to the existing literature on collaboration and strategic partnerships in the O&G sector. By studying the Asset Partner model, this research aims to expand theoretical knowledge about alternative business models and their implications for increasing competitiveness in the market. It also adds to the understanding of the roles and responsibilities of the parties involved in such a partnership, including the operator companies, trade unions, and oil service companies.

Practically, this work is relevant as it addresses a real-world problem faced by the industry. The findings and insights from this research can provide practical guidance to stakeholders in the O&G industry, enabling them to make informed decisions regarding the implementation of the Asset Partner model. It offers insights into risk management, safety culture development, market fluctuations, compliance with regulations and optimizing operations, which are all crucial aspects for successful partnerships in the industry.

The theoretical and practical relevancies of this work lie in its potential to enhance the understanding of the Asset Partner model, its implications for the O&G industry, and the strategies required to address the challenges and opportunities associated with this partnership. By providing valuable insights and recommendations, this research contributes to the knowledge base and practical application of partnership models in the industry, ultimately aiming to drive increased competitiveness and operational excellence.

1.3 Research question and Objectives

The research questions that the thesis is going to answer are:

1. What are the benefits and challenges of implementing an "Asset Partner" model in the O&G industry, and how can it be used to increase competitiveness in the market?
2. How do regulations and authorities, such as the Petroleum Safety Authority impact the implementation and success of the "Asset Partner" model in the O&G industry?
3. How does the "Asset Partner" model compare to traditional contractor and partnership models such as Technical Service Provider (TSP) model.
4. What are the specific business models and strategies that can be used to effectively implement the "Asset Partner" model in the O&G industry?

The research questions are based on the methodology of qualitative research, by interviewing several professionals in different roles on the NCS. The literature review is based on if it is similar models or partnerships today in other countries, and how can we implement it into the Norwegian sector. It will also address some of the opportunities or challenges on NCS today, and investigate other partnerships within other activities, such as drilling- and well, and maintenance and modifications.

The objective of this model is to provide a comprehensive service for operator companies, allowing oil service companies to assume responsibility for the day-to-day operation of assets. This model includes a resource pool of qualified personnel to manage the operation of the assets where the service provider is responsible for all aspects of staffing and performance of the operation. The service provider is also accountable for delivering results that meet the operational goals of the operator company in a safe and cost-efficient manner.

The primary target market for this model are late-life or end-of-life projects, providing operator companies with the option to outsource the final stages of production. Additionally, this model can be utilized in early-life and start-up operations to ensure optimal performance before the operator company assumes control. A specific example of this model in action would be on unmanned production platforms/installations during the first years of production, prior to transitioning to remote operation. This service model facilitates consistent and optimized performance prior to the transfer of daily operations to the operator company.

An evaluation of capacity and competence for personnel will also be included, given that a report by The Petroleum Safety Authority (PSA) identifies this as an escalating challenge in today's offshore operations. Furthermore, trade unions' role is crucial in this context as they serve as a key role of employees' rights and interests [5].

The goal of this master's thesis is to conduct a market survey to explore the potential for this business model within the NCS. The research will investigate the demand for this service among operator companies, assess the impact of regulations, authorities, and government on the feasibility of this model, and identify practical considerations for implementing this model in current operations. Additionally, the thesis will investigate the requirements and perspectives of both operator companies and service providers, as well as the requirements of trade unions representing workers and the perspectives of government and authorities.

The Norwegian Model emphasizes collaboration between companies in various industries and sectors as a key aspect for sustainable development and growth. The model encourages companies to work together to address societal challenges, enhance their competitiveness, and contribute to the wider goal of a sustainable and equitable society [6].

1.4 Methodology

This research utilized a qualitative approach to investigate the challenges and opportunities associated with implementing the Asset Partner model. Semi-structured interviews were conducted with key stakeholders, including representatives from operator companies, trade unions, and an oil service company.

Participants were selected based on their expertise and roles to provide diverse perspectives on the Asset Partner model. The interviews were guided by an interview guide developed from a literature review and research objectives, allowing for flexibility to explore emerging themes. Thematic analysis was employed to analyze the qualitative data, identifying common themes and patterns related to the research question.

The analysis followed a systematic and iterative process to derive meaningful insights. The findings contribute to a deeper understanding of the Asset Partner model and have implications for future research and practical implementations in the O&G industry.

1.5 Thesis Scope and structure

The thesis is composed of seven comprehensive chapters, encompassing everything from the introduction to the conclusion.

***Table 1**: Thesis structure – Chapters.*

Chapter 1 - Introduction	To conduct thorough research and analysis, this study will present the general concept and explore the history of the O&G industry. This will provide insight into the interaction between oil operators and service companies. To address this issue, this study will involve a combination of theory and data collection. The introductory chapter will present the issue and pose relevant questions.
Chapter 2 - Research Methodology and Design	Chapter two is the research methodology chapter which outlines the approach and strategies employed in this master's thesis to achieve the research objectives. It discusses the research philosophy, approach, data collection methods, and analysis techniques used in the study, providing a comprehensive understanding of the research process.
Chapter 3 - Background	The literature review, chapter three explores the "Asset Partner" concept and compares it to similar international models used by oil service companies. It discusses relevant topics such as asset management, operations management, capacity management, lean principles, and total quality management. The chapter also highlights the regulations and roles of various entities within the NCS, emphasizing the importance of personnel, competence, and training in asset management.
Chapter 4 - Data collection	In the fourth chapter data collection, it focuses on the qualitative approach used to gather data from different stakeholders in the O&G industry. It provides an overview of the participants involved in the study, including operator companies, trade unions, and an oil service company. The chapter explains the interview process, participant selection, and the questions asked to gather insights into their perspectives on the Asset Partner model.

Chapter 5 - Analysis and Results	Chapter five is the analysis and results chapter which presents the key findings derived from the interviews conducted with stakeholders in the O&G industry. It provides a comprehensive analysis of the data collected, focusing on the perspectives, challenges, and potential benefits associated with the Asset Partner model. The chapter discusses the common themes and patterns identified from the interviews, providing valuable insights into the implementation of this partnership model.
Chapter 6 - Discussion	In chapter six the discussion examines the findings from the interviews and literature review, discussing the implications and practical implications of the Asset Partner model in the O&G industry. It highlights the challenges and opportunities identified and provides recommendations for the successful implementation and management of the Asset Partner model. The chapter also discusses the limitations of the study and suggests areas for further research.
Chapter 7 - Conclusion	The conclusion chapter provides a comprehensive summary of the key findings and insights obtained throughout the research process. It highlights the main contributions of the study, including a better understanding of the Asset Partner model and its potential implementation in the O&G industry, particularly on the NCS. The chapter also discusses the implications of the findings, both theoretical and practical, and their relevance to industry stakeholders, regulatory authorities, and future research. The conclusions drawn from the study emphasize the importance of collaboration, strategic partnerships, and effective management in addressing challenges and leveraging opportunities in the O&G industry.

1.5.1 Limitations and challenges

Some limitations have been made to limit the complexity of this thesis and to get a clearer and in-depth analysis of the essentials of the project. The limitation has been mostly related to sectors and the location of the sector but has some aspects of others without going in-depth about it.

The sector has been limited to the O&G sector on the NCS, due to the relevance of this thesis and the information available. Often new industries such as wind, solar and other industries have less availability of information than the O&G sector, due to competition and technological development. The sustainable industry is also a less investigated and developed industry which makes the information data a lot smaller.

If we look at the O&G industry, this has been a dominant player in the energy sector for over a century. Compared to sustainable energy that are still developing, there is more readily available information about the O&G industry. This sector has also been a highly investment object compared to other sustainable energy sources, resulting in more research and development on oil-related projects. Although this sector has been dominant for a century, it still has a very high

focus on developing. This includes new and innovative solutions to reduce emissions, as well as maintaining a high profit [7].

One limitation of the study relates to the interviews and data collection process. Understanding the companies' strategies in relation to the model requires the interviewees to be familiar with the specific business model being discussed. The answers are based on contestants' opinions regarding their companies' potential benefits and how the model could be implemented. It will also vary from participant to participant due to their different positions and experience in the company.

All operator companies on the NCS were invited to contribute to this thesis. However, not all responded or were able to participate. As a result, the representation of the NCS market in relation to this business model might be skewed. The Norwegian Petroleum Directorate (NPD) was also approached, but they only referred to the Norwegian Petroleum Act, the governing legislation for petroleum activities in the NCS. The Petroleum Safety Authority (PSA) was also contacted, but they were unable to contribute directly through an arranged interview. Nonetheless, I was able to establish dialogue with several contacts within the PSA. Even though these contacts did not directly contribute to the thesis, they provided information that served as the basis for understanding the authorities' perspectives for such a partnership model. They provided information through sharing relevant documents that will serve as the perspective of the government and authorities of the Asset Partner model.

This study also gathers insights from both trade unions and professionals from an oil service company as well, to provide a comprehensive understanding of the Asset Partner model. It is important to acknowledge the limitations and challenges related to these interviews. Firstly, the sample size of the interviews may be limited, as the focus was primarily on the two major trade unions and a selection of professionals within one oil service company. This means that the findings may not fully represent the entire population of trade unions and oil service companies operating in the industry.

Additionally, the interviews were conducted from a specific trade union perspective, which may introduce a certain bias in the responses. The personal experiences, opinions, and individual circumstances of the respondents could also influence the findings and limit their generalizability.

It is also worth mentioning that the conducted interviews involved participants using various terms about the oil service company or the partner in an Asset Partner model. This could be terms such as third-party, oil service provider, service provider, service company, outsourcing company, outsourcing partner, contractor, and more. It should be stated that independent of the terms used, it refers to the partner or the third-party company that forms a partnership with the operator company. As well as the term partner being used differently, the operator company could also have different terms. This can be referred to as oil and gas operator, oil operator, exploration, and production (E&P) company, etc.

In addition to these challenges, an attempt was made to expand the depth of the study by reaching out to international companies that utilize this business model like the Asset Partner model. These international organizations did not respond. Their lack of response limited the data collection only to Norwegian companies, potentially creating a bias. This limitation may affect how widely the findings can be applied, as the research might not fully reflect the practices of the Asset Partner model or similar models in different parts of the world and within different cultures.

Despite these limitations, the interviews provided valuable qualitative data, offering insights into the perspectives, considerations, and challenges associated with the implementation of the Asset Partner model in the O&G industry.

1.5.2 Project plan

At the beginning of the project, an initial project plan was established, as depicted in Figure 2. The plan was influenced by optimism and the expectation of a seamless and uninterrupted working period, assuming no unexpected challenges would affect the progress. However, this idealized plan proved unrealistic due to challenges in the collection of data, which significantly impacted the project's progress.

As a result, Figure 3 presents a revised project plan that reflects the actual plan of the project. The yellow color reflects the time of the project, the blue reflects the predetermined deadline of the project, and the green color reflects the actual deadline of the project.

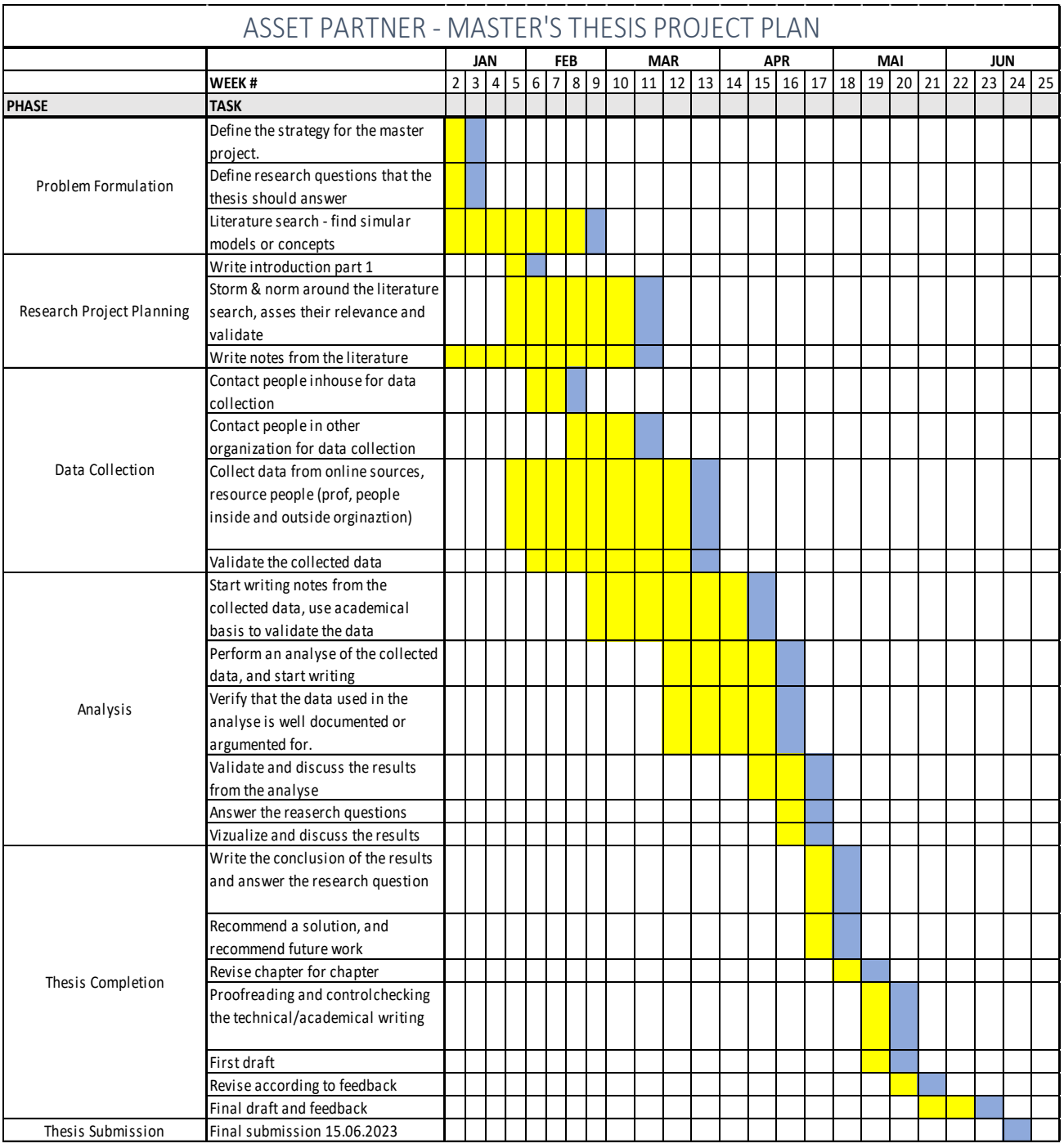

Figure 2: *Project Plan.*

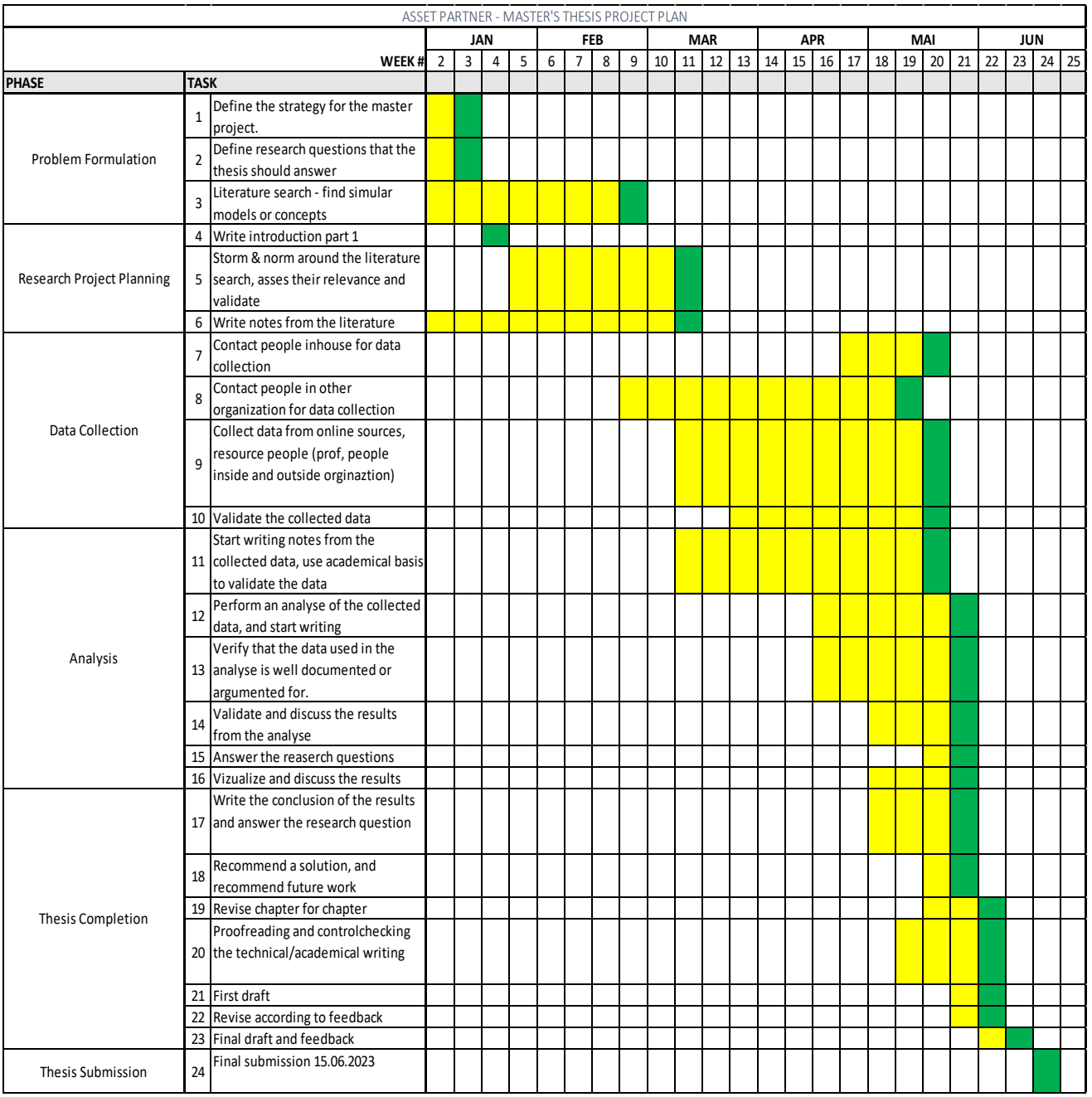

Figure 3: *Revised Project Plan.*

2 Research Methodology and Design

This chapter presents the research methodology employed in this master's thesis to achieve the research objectives. The methodology involved a comprehensive literature review, qualitative data collection, and analysis to gain insights into the implementation of the Asset Partner model on the NCS. The research philosophy, approach, strategy, method, data sources, and techniques are defined to provide a comprehensive understanding of the research process.

2.1 Research Philosophy and Strategy

By answering the research questions presented in the chapter Research question and Objectives, a seven-step process was utilized, which is illustrated in Figure 4.

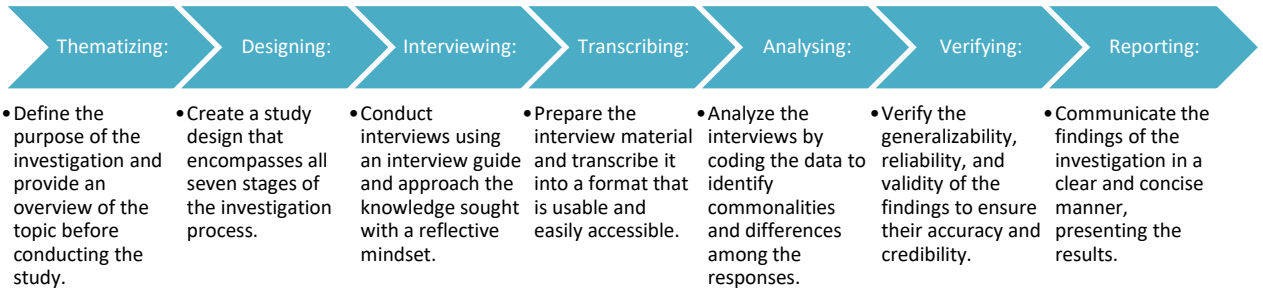

Figure 4: *Seven stages of an interview investigation [8].*

The research philosophy underlying this study is interpretivism, as it seeks to understand and interpret the subjective experiences, perspectives, and challenges of stakeholders related to the Asset Partner model. This aligns with the qualitative nature of the research approach adopted in this study [9].

The research approach employed in this study is qualitative, aiming to gather in-depth insights and understanding of the research topic. It allows for a comprehensive exploration of the experiences and perspectives of the participants involved in the implementation of the Asset Partner model.

The research strategy utilized in this study includes a literature review and qualitative information gathering from companies and organizations operating within the NCS. The literature review examined international models similar to the Asset Partner model, strategies for optimizing operations, and information about the NCS and the various roles involved in activities on the NCS. This gathered information will serve as a basis for understanding the NCS and organizational strategies, offering valuable insights and a basis for comparison.

2.2 Research Method and Objectives

The research method employed in this study is qualitative, using interviews and literature review as the primary data collection techniques. Interviews were conducted to gather insights and experiences of participants, while the literature review provided a theoretical framework and comparative analysis.

The data sources utilized in this study include:

- Literature: International models similar to the Asset Partner model were reviewed, as well as strategies for optimizing operations, and information about the NCS and the various roles involved in activities on the NCS to gain insights and understanding.
- Interviews: Operator companies, trade unions and professionals from an oil service company were interviewed to gather qualitative data and perspectives on the implementation of the Asset Partner model.
- Online sources: Regulations and policies set forth by the government and authorities were accessed through online platforms such as regjeringen.no and PTIL.no (PSA).

The data collection techniques included:

- Semi-structured Interviews: Physical interviews or Microsoft Teams were conducted with a purposive sample of participants from operator companies, trade unions and professionals from an oil service company. The interviews followed an interview guide consisting of open-ended and follow-up questions.

The thesis objectives were as mentioned participants from operator companies, trade unions and oil service providers. In this study, total 22 interviews were conducted from the operator companies, three from trade unions and five from oil service providers as illustrated in Figure 5.

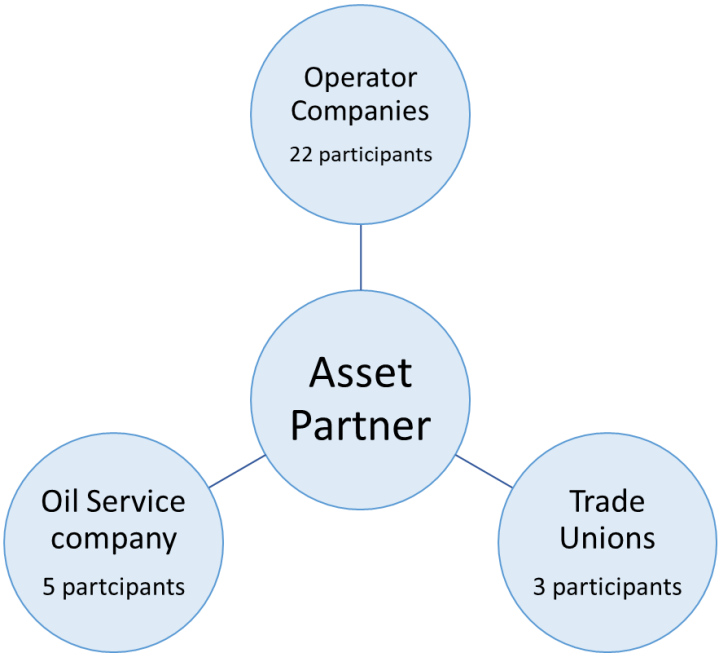

Figure 5: *Participants, Operator companies, Trade unions, Oil service Company.*

2.3 Data Collection

The collected data, including interview transcripts and literature review findings, underwent a rigorous process of analysis. The qualitative data were analyzed using thematic analysis, identifying common themes, patterns, and insights related to the research objectives. The analysis involved categorizing and interpreting the data to derive meaningful findings.

The data gathered was verified using triangulation, a process that improves the accuracy and dependability of the findings. Triangulation involved cross-checking information from various sources, including interviews, literature, and online resources, to strengthen the research's validity and reliability [10].

Ethical considerations were considered throughout the research process. Informed consent was obtained from all participants, ensuring confidentiality and anonymity. The research was conducted in accordance with ethical guidelines and regulations.

This chapter provided an overview of the research methodology employed in this master's thesis. The research objectives, philosophy, approach, strategy, method, data sources, and techniques were defined to guide the research process. The methodology involved a comprehensive literature review, qualitative data collection from operator companies and trade unions, and analysis of regulations and policies. The research approach was qualitative, aligning with the interpretive nature of the study.

Ethical considerations were addressed throughout the research process, ensuring the confidentiality and anonymity of participants. The responses of the participants weren't quoted verbatim but rather summarized to capture the overarching trends observed across all interviews. For instance, "risk" was a recurring theme in all discussions, and the text subsequently provides a synthesized representation of the participants' views on risk. Consequently, the text presented in the data collection is a summarization of all interview responses. Despite the limitations, the chosen methodology provides valuable insights into the implementation of the Asset Partner model on the NCS and contributes to the existing body of knowledge in the field.

2.4 Ethical Considerations

In qualitative interviews, it is important to maintain trust, confidentiality, respect, and transparency as essential aspects to maintain a high ethical standard in research. These principles contribute to the integrity of the study and the well-being of the participants. Furthermore, it is crucial to emphasize the significance of storing data and contact information in a safe and secure manner. Protecting the confidentiality and privacy of participants' data forms a basis to ensure their trust and comply with ethical guidelines. Safeguarding the information minimizes the risk of unauthorized access and maintains the participants' anonymity and confidentiality throughout the research process [11].

In adherence to ethical requirements, this research project strictly obtained the explicit consent of participants before commencing. Additionally, participants were assured the right to withdraw their contribution without facing any negative consequences. Prior to conducting the interviews, participants were fully informed about the importance of maintaining anonymity, and their explicit consent was obtained by their agreement to participate in the interviews. In some cases, interviews were recorded with the participants' consent.

To ensure the accuracy and reliability of the collected data, a data collection phase was initiated, where all participants received a summary of their interview responses. Participants were given the opportunity to review and provide feedback or corrections to the collected information, thereby ensuring the validity of the data used in this thesis.

Given the central ethical consideration of data storage and management, audio recordings during the interviews were securely stored in a protected folder accessible only to the project owner. The audio recordings were exclusively used for transcription purposes and were subsequently deleted. To ensure adherence to the appropriate ethical guidelines, a project application was submitted and approved by the Norwegian Centre of Research Data (NSD) prior to conducting the interviews.

3 Background

This chapter explores the "Asset Partner" concept and compares it to similar international models used by oil service companies like John Wood Group plc. and Petrofac Limited. It discusses asset management and its relevance to the O&G industry, as well as operations management, capacity management, LEAN principles, and total quality management. The chapter also highlights the NCS, its regulations, and the roles of various entities within the NCS, emphasizing the importance of personnel, competence, and training in asset management.

3.1 Theories about the topic

This thesis is a project written at the University of Stavanger in collaboration with the company Moreld Apply.

Moreld Apply is a leading multi-disciplinary engineering firm with a specialization in contract management across all phases of a project, including conceptual development, studies, completion, and commissioning. The organization offers a wide range of services, including operations, maintenance, and modifications of O&G production facilities on the NCS [12].

Moreld Apply is one of many companies under the parent company Moreld, which is an industrial group that delivers comprehensive solutions to a diverse range of industries, including offshore energy, renewable energy, marine, aquaculture, and onshore markets. Through its subsidiaries, the company specializes in engineering, ocean, life cycle, energy, and technical assistance, providing clients with focused, customized, and sustainable services [13].

3.1.1 Similar models

The term “Asset Partner” is not a defined and known term. On the other hand, the model that this can be compared to is a known and used business model internationally. The business model is where a service company provides a service to take over the operation of an asset on behalf of an O&G company or an operator and becomes responsible for the daily operation. This model is being used by companies such as John Wood Group plc. and Petrofac Limited who both are international oil service companies [14] [15].

Another comparable model is the TSP, in which a company manages the daily operations of an asset. Gassco AS, a Norwegian operator responsible for the operation and development of the gas transport system from the NCS to Europe, defines a TSP as:

"*Products and services for our operatorship and business areas are largely procured directly or by our technical service providers (TLPs). The latter are companies responsible for day-to-day operation of part of our facilities. Statoil is the largest of these, and operates our processing plants at Kårstø and Kollsnes, for example. Our procurement department has a responsibility to supervise and see to it that the TSPs pursue their procurement activities in compliance with the service agreement*" [16].

John Wood Group plc:
Wood is a company with more than 40 years of experience in improving performance, reliability, and extending the lifetime of assets. They offer a range of services such as skilled manpower, full facilities management, and control of major accident hazards (COMAH) site operator services [17].

In their service they provide high-quality operations personnel, from technicians and tradesmen to supervisors and managers. To ensure efficient service delivery, safety performance, and work execution, Wood uses a service excellence framework with various systems, tools, and processes. Wood takes a managed service approach, where they build responsibility up to operating partnerships. They are fully committed to sharing risk and responsibility for the asset's performance. As a duty holder, Wood is serious about assessing and maintaining asset integrity [17].

Petrofac Limited:
Petrofac helps new energy industry entrants manage their assets safely and profitably. They offer customized support, including people provision and fully managed services as duty holder, service operator or COMAH site operator, to match clients' needs. Petrofac shares the risk, increases value, and has unique insights into challenges and regulatory requirements as a pioneer of the Duty Holder model since 1997 [18].

Petrofac offers predictable operations, supporting hydrocarbon and wind sectors, while reducing operating costs and delivering safely improved energy production efficiency. Their highly skilled operations personnel use proven processes, systems, and digital technology to drive best practices in integrity management and assurance, asset planning, maintenance scheduling and rationalization, shutdown and turnaround delivery, operational improvement, and production efficiency. Petrofac's global network of Technical Authorities investigates, diagnoses, and resolves challenges in these areas. Figure 6 is an illustration of the Petrofac Limited work strategy for maximizing value for the customer [18].

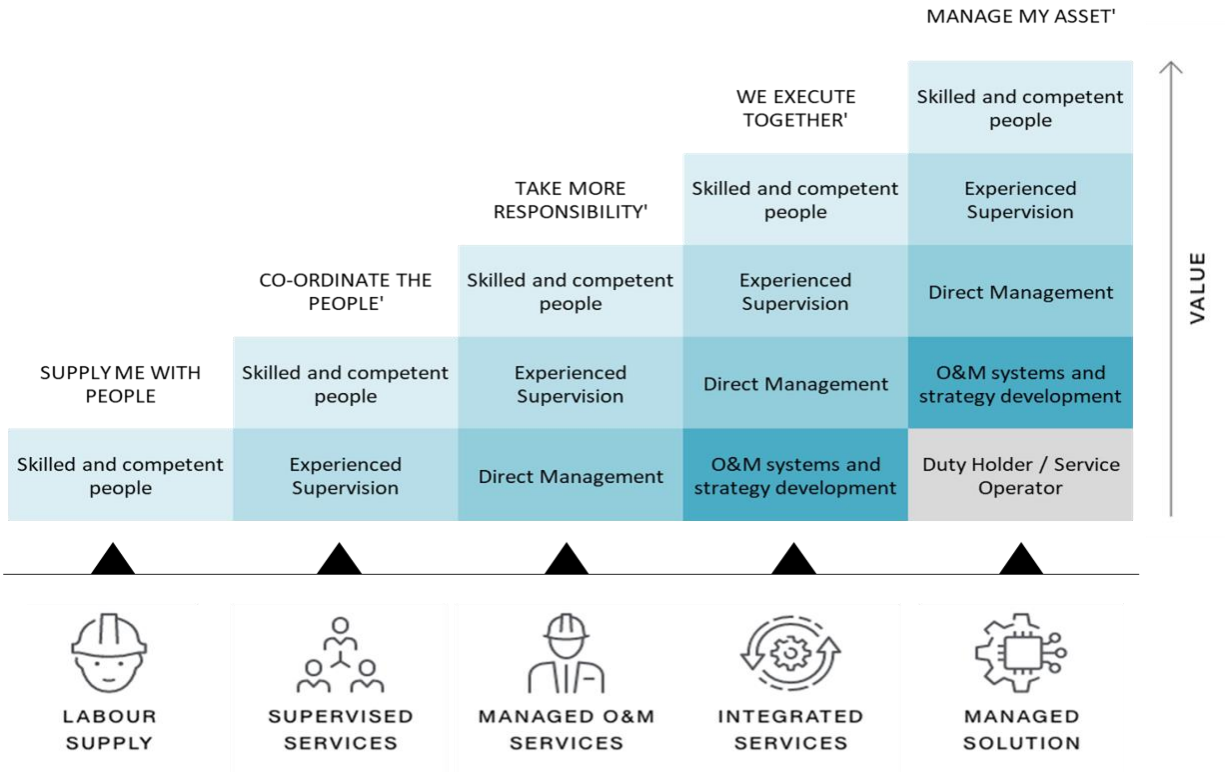

Figure 6: *Petrofac Limited work strategy for maximizing value for the customer [18].*

3.2 Asset Management

Asset management is a systematic and coordinated approach to managing assets throughout their lifecycle. It involves identifying, acquiring, operating, maintaining, upgrading, and disposing of assets in a cost-effective manner. Effective asset management can optimize asset performance, mitigate risks, reduce costs, and improve sustainability [19].

Assets are items, things, or entities that have potential or actual value to an organization. They can be physical or non-physical and may have different types of value, such as financial, operational, or strategic. Assets require different types of management strategies throughout their lifecycle to optimize their value to the organization [20].

Effective asset management requires a clear understanding of an organization's asset portfolio, including identifying and mitigating the risks associated with asset ownership and operation. Asset management should be integrated with an organization's overall business strategy and objectives. Communication and collaboration among stakeholders, appropriate technology and data management, ongoing monitoring and evaluation, and adaptability to changes are crucial aspects of asset management [19].

Asset management can contribute to maximizing value, minimizing risk, and optimizing performance. By using asset management strategies such as preventative maintenance, organizations can reduce downtime, lower repair, and replacement costs, and improve the overall efficiency of their operations. Effective asset management also helps organizations make informed investment decisions by balancing costs, risks, and opportunities, resulting in better financial outcomes [19].

Another benefit of asset management is that it can help organizations manage risk. By implementing effective risk management strategies, organizations can decrease financial losses, increase health and safety, goodwill, and reputation, as well as reducing environmental and social impact. This results in a decrease in liabilities such as insurance premiums, fines, and penalties. Asset management can also help organizations demonstrate their social responsibility by improving their capacity to reduce emissions, preserve resources, and adapt to climate change. This allows them to demonstrate socially responsible and ethical business practices and stewardship [20].

3.2.1 Asset Management System

The organization uses an asset management system to manage and oversee its asset management activities. This system provides better control over risks and ensures that asset management objectives are consistently met. Nonetheless, there are certain aspects of asset management, such as leadership, culture, motivation, and behavior, that cannot be entirely formalized through the asset management system. Organizations may use other arrangements to manage these aspects, which can greatly impact the achievement of asset management objectives. Figure 7 illustrates the relationship between critical asset management terms [20].

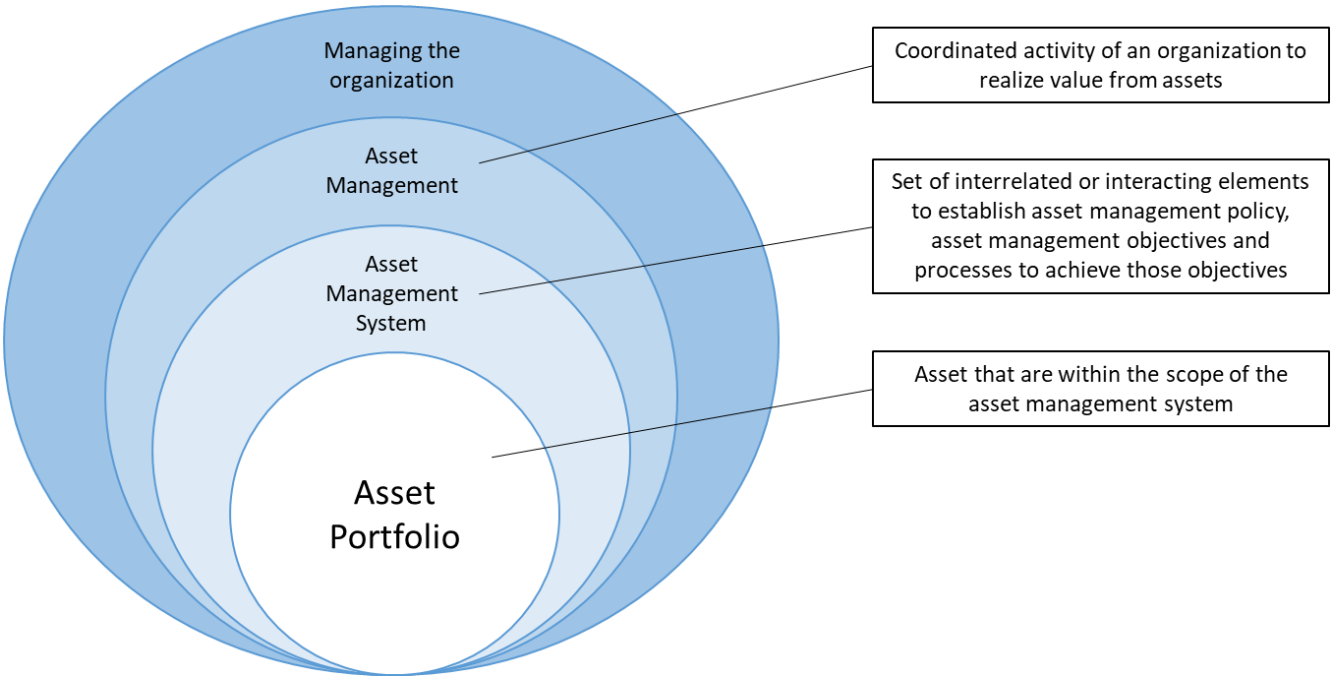

Figure 7: *Relationship between key terms [20].*

An asset management system is a set of interrelated elements within an organization that establishes policies, plans, and processes necessary for effective asset management. It's not just a management information system but interacts with various functions within the organization to coordinate and integrate asset management activities. Developing an asset management system can bring new perspectives and stimulate improvements in other organizational functions, such as finance, human resources, and information technology.

Top management can benefit from an asset management system's insights and cross-functional integration, which help them understand asset performance, risks, investment needs, and value as input for decision-making and strategic planning. An asset management system also provides a framework for integrating technical standards, codes, guidelines, and best practices, supporting the implementation of asset management.

The asset management system supports energy management, environmental management, and other activities related to sustainability. The finance function can benefit from improved data and linkages between asset management and finance functions, enabling the balancing of short-term and medium/long-term plans for assets.

3.2.2 Asset Management in the O&G industry

Asset Management in the O&G sector presents unique challenges, including complex and costly assets, remote and hazardous locations, and strict regulations. Best practices in Asset Management can help organizations in the O&G sector optimize asset performance, reduce costs, and improve safety and environmental performance [19].

Asset management is highly relevant to organizations as it helps to optimize the performance of assets, which is one of the key objectives of asset management. Effective asset management can help to improve operational efficiency, extend the life cycle of assets, reduce maintenance costs, and increase overall profitability. One of the benefits of asset management is that it allows organizations to have a better understanding of the assets they are managing. By using data-driven analysis and decision-making processes, asset management can help organizations to identify areas of improvement and optimize their operations. It also enables them to have a more holistic view of the assets and to make informed decisions that benefit the organization [19].

However, implementing asset management can also present challenges. One of the challenges is the complexity of managing multiple assets across different locations, which requires effective coordination and communication among the organization's stakeholders. Another challenge is the need for a standardized approach to asset management that can be used across all assets.
This requires a shared understanding of the asset management practices and a commitment to implementing them consistently [19].

Overall, asset management is essential to the success of organizations in the O&G sector. By optimizing the performance of assets and improving operational efficiency, it can create value for the organization. While there are challenges to implementing asset management, they can be overcome through effective communication, coordination, and a commitment to shared goals [19].

3.2.3 Operation Management

Operations management entails optimizing resources and refining production processes to boost efficiency and minimize expenses. It encompasses the management of all operational aspects, including exploration, production, transportation, refining, and supply chain management. In the O&G industry, operations management plays a crucial role in guaranteeing the safe and efficient functioning of facilities while addressing the risks associated with potential hazards. Proper maintenance management is also vital, and employing predictive maintenance methodologies can contribute to optimizing both maintenance and operations management. Performance assessment and ongoing improvement are crucial for pinpointing areas of enhancement and elevating operational efficiency [21].

Proficient leadership and management capabilities are essential for successful operations management within the O&G industry. The objective of operations management is to enhance product and service quality while reducing expenses. In this context, managing supply chains effectively can be demanding due to the intricate nature of the O&G sector's supply chain. Consequently, optimizing operations management in this industry necessitates a comprehensive approach that incorporates efficient communication, risk management, maintenance management, and performance evaluation [21].

3.2.4 Capacity Management

Capacity management refers to the process of regulating an organization's capacity to generate goods and services, fulfilling customer demand while minimizing expenses and optimizing profits. Within the O&G industry, proficient capacity management entails overseeing the capacity of drilling rigs, pipelines, and refineries to produce and transport O&G effectively. Capacity limitations may occur due to factors such as equipment malfunctions, maintenance, or weather conditions. Successful capacity management involves anticipating these limitations and devising contingency strategies to address them [22].

Outsourcing can serve as a viable strategy for handling capacity in the O&G industry; however, it also brings about risks, including loss of control over quality and intellectual property. Efficient workforce management is crucial for capacity management in this sector. This process involves guaranteeing the availability of appropriate skills at the right time to meet demand, such as employing temporary workers during high-demand periods or offering supplementary training to current workers to tackle capacity restrictions [22].

3.2.5 LEAN

LEAN is a management approach focused on reducing waste and enhancing processes to boost efficiency and effectiveness. Originally developed by Toyota in the 1930s, this philosophy has gained widespread adoption across various industries. Although it started in manufacturing, LEAN has expanded to encompass diverse sectors, such as healthcare, construction, and service industries [23].

The principle of LEAN emphasizes the elimination of waste and improvement of processes to increase efficiency and effectiveness. It can be applied in an organization to optimize the asset operations and minimize waste. By adopting LEAN principles, inefficiencies in maintenance or production processes can be identified and eliminated, communication and coordination can be streamlined, and performance can be continuously monitored and improved. This results in increased productivity, reduced costs, and improved safety and quality, while supporting a culture of continuous improvement and collaboration [23].

By adopting LEAN principles such as value stream mapping, just-in-time production, and continuous improvement, the asset operator and the third-party company can optimize processes to eliminate waste and improve efficiency. Value stream mapping can help identify waste and eliminate unnecessary steps, while just-in-time production can ensure that the right resources are available at the right time, reducing waste and increasing productivity. Continuous improvement can help identify areas for improvement and optimize processes to increase efficiency [24].

Applying LEAN principles in partnerships or collaborations can lead to increased profits for both parties involved. By striving to maximize value and quality at every step, companies can optimize asset performance, improve efficiency, eliminate waste, and continuously improve [24].

3.2.6 Total Quality Management

Total Quality Management (TQM) is a holistic business management philosophy that prioritizes continuous improvement and customer satisfaction. This all-encompassing approach engages every member of an organization in the pursuit of consistently enhancing processes and products to meet and surpass customer expectations. By placing customers at the core of all operations, TQM aims to deliver products and services that not only satisfy customer needs but also exceed their expectations. The strategy highlights employee empowerment streamlined and effective business processes, data-driven decision-making, robust leadership, and strong supplier relationships as essential components for achieving lasting success. [25].

Continuous improvement is a crucial element for any organization, encompassing the perpetual assessment and enhancement of business processes, systems, and services to increase efficiency and quality. Engaging employees in problem-solving and decision-making is vital to this approach's success, as it fosters a sense of responsibility for maintaining service quality [25].

This method emphasizes the significance of streamlined business processes and the utilization of data and analysis to pinpoint areas for improvement, monitor progress, and make informed decisions. By minimizing errors and waste, this approach can lead to cost savings and heightened efficiency. Additionally, robust leadership is indispensable in cultivating a culture of quality and continuous improvement, with leaders setting the tone and providing resources for implementation and maintenance. Supplier relationships are equally important, necessitating close collaboration to guarantee adherence to quality standards and encourage improvement throughout the supply chain [25].

Another strategy is the Plan, Do, Check and Act (PDCA) cycle illustrated in Figure 8 which is a continuous improvement model with four stages: Plan, Do, Check, and Act. It involves setting goals and developing a plan (Plan), implementing the plan (Do), evaluating results (Check), and acting based on the evaluation (Act). It is a systematic approach for driving ongoing improvement [26].

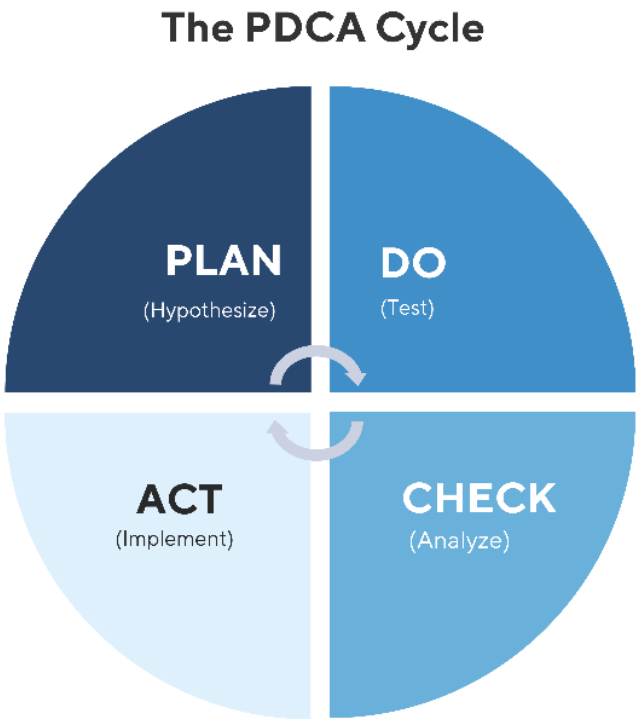

Figure 8: *PDCA-cycle [27].*

This all-encompassing approach to service management involves every member of the organization and prioritizes customer-centricity, continuous improvement, employee empowerment, process orientation, data-driven decision-making, strong leadership, and supplier relationships to achieve lasting success [25].

3.3 Norwegian Continental Shelf (NCS)

The history of the Norwegian oil industry began in the late 1960s with the discovery of oil reserves on the NCS. In 1972, the Norwegian government established the NPD to supervise the exploration, production, and distribution of petroleum resources within the NCS. Initially, the NCS was dominated by international oil companies; however, the Norwegian government soon implemented policies to increase national ownership and control over the industry [28].

Statoil (now Equinor) was founded in 1972 as a state-owned company responsible for managing and operating Norway's petroleum resources on the NCS. Equinor evolved into a major international player in the O&G industry, becoming the first Norwegian operator on the NCS. Subsequently, several other Norwegian companies entered the market and emerged as significant players in the Norwegian oil sector [28].

The Norwegian government's policies and regulations have contributed to the responsible and sustainable operation of the petroleum industry on the NCS. The NPD remains a pivotal regulatory body, while companies like Equinor and others continue to spearhead innovation in the exploration, production, and distribution of petroleum resources on the NCS [28].

3.3.1 Petroleum Operations

The Norwegian government sets requirements for companies conducting petroleum operations on the NCS, with duties applying to all operators and licensees, regardless of size. The operator must have an organization in Norway with the in-house expertise to ensure petroleum activities are carried out in accordance with regulations, including Health, Safety and Environment (HSE) regulations.

The operator bears the responsibility, known as the "see to it" duty, to ensure that all work conducted on its behalf adheres to regulations. They are also responsible for verifying the competence and qualifications of contractors and monitoring their work. The licensee must follow up activities in the production license, supervise the operator in a systematic manner, and take a risk-based approach to discharging its "see to it" duty, which may include auditing the operator. The licensee must also ensure the operator has a functioning management system, qualified organization, and is dealing with problem areas and submitting key applications to the authorities [29].

3.3.2 Regulations from the authorities

The "Norwegian Petroleum Act" establishes the legal framework for petroleum activities on the NCS:

- Operators must obtain a production license from the Ministry of Petroleum and Energy.
- The production license outlines authorized areas and conditions for petroleum activities.
- Operators must adhere to all relevant HSE regulations during petroleum activities on the NCS.
- PSA supervises and regulates petroleum activities on the NCS, including HSE regulations enforcement.
- Operators must have a comprehensive emergency response plan and regularly test and update it.
- Operators must report any incidents, accidents, or near misses to the PSA and other relevant authorities.
- Operators must prevent pollution and minimize the environmental impact of petroleum activities.
- Operators must not interfere with other sea users' interests, such as fisheries and shipping.
- Operators must comply with all relevant tax regulations, including paying royalties on petroleum production.
- Operators must ensure their activities do not harm cultural heritage or other essential values.
- Operators must regularly assess petroleum resources in their license areas and report their findings to the Ministry of Petroleum and Energy.
- Operators must cooperate with authorities for the safe and efficient development of petroleum resources on the NCS.
- The Ministry of Petroleum and Energy can revoke or modify a production license if the operator fails to comply with the license's conditions.
- Operators must conduct activities transparently and responsibly, considering stakeholders' interests and the public.

In summary, the "Norwegian Petroleum Act" aims to ensure that petroleum activities on the NCS are conducted safely, efficiently, and responsibly while considering all stakeholders' interests and the environment [30].

3.3.3 Roles on NCS

The NCS has numerous players performing various tasks. Figure 9 illustrate the connection between O&G corporations or operators (shown in dark blue) and different service and supply sectors (shown in light blue). It's worth noting that although there are other services involved (represented by orange), any activities related to petroleum in these sectors aren't included in the service and supply industry.

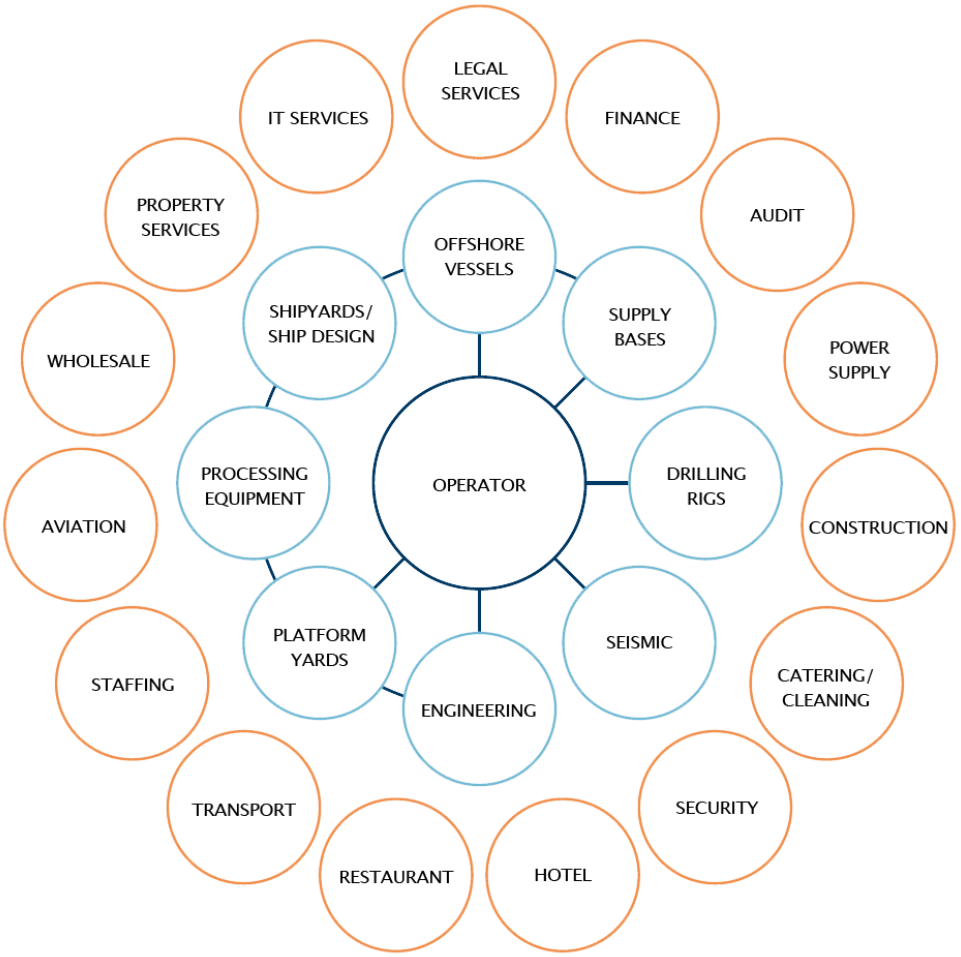

Figure 9: *Direct and indirect petroleum-related activity [31].*

3.3.4 Operator Company

Operator companies on the NCS are responsible for the overall management and operation of a particular field or fields. This includes planning and executing exploration and production activities, as well as ensuring compliance with regulations and safety standards. The Norwegian government sets strict requirements for companies conducting petroleum operations on the NCS. These requirements apply to both operators and licensees, regardless of their size [29].

Operators are responsible for the day-to-day management of activities in a production license and must have an organization in Norway that can ensure operations are conducted in accordance with regulations. Licensees are responsible for following up activities in the production license and must ensure the operator has a functioning management system and an adequately qualified

organization. They must also take a risk-based approach to discharging their "see to it" duty and may have to audit the operator in some cases [29].

The operator collaborates extensively with other companies engaged in the field, including partners and service providers, to synchronize and enhance operations. Furthermore, the operator usually manages the financial aspects of the field, such as budgeting and reporting. Holding the rights to explore for O&G in a block and develop a field for production upon a commercial discovery, the operator company often represents a consortium of companies [32].

The term "duty holder," widely used in the international O&G industry are used to describe a person or organization that has legal responsibility for the safety of people and the environment in connection with the exploration, production, and transportation of O&G [33].

On the UK Continental Shelf, duty holders are legally obligated to establish safety management systems that identify, evaluate, and control the risks associated with their operations. Additionally, they must ensure that all personnel working on the installation have the appropriate training and competence to carry out their tasks safely [33].

While the term "duty holder" is not commonly used on the NCS, the responsibilities for operators are the same as those for duty holders.

3.3.5 Outsourcing

Outsourcing is a strategic method used by organizations to delegate specific tasks or operations to external service providers, rather than performing them in-house. The main goal of this approach is to cut costs and increase efficiency, allowing companies to focus on their core competencies [34].

Various functions can be outsourced, including customer support, manufacturing processes, information technology services, and human resources management. Key benefits of outsourcing consist of lower labor costs, access to specialized expertise, and the ability to quickly scale operations. However, there are potential risks, such as reduced control over certain business aspects, communication challenges, and potential harm to the organization's reputation if the external provider fails to meet expected standards [34].

In essence, outsourcing is a deliberate decision made by businesses to allocate specific tasks to external entities like oil service companies, aiming for cost reduction and improved efficiency. While outsourcing can provide numerous advantages, it is crucial for organizations to assess potential risks and establish strong partnerships with reliable third-party providers to ensure positive outcomes [34].

3.3.6 Oil Service Company

Multidisciplinary oil service companies operating on the NCS play a vital role in the energy sector and for operator companies. They offer a wide range of services, such as engineering, ocean, life cycle, energy, and technical assistance, enabling clients to receive focused, customized, and sustainable solutions. They are responsible for the development, maintenance, and modifications of O&G production facilities on the NCS, and provide expertise in studies, Front End Engineering Design (FEED), system integration, operations support, and engineering [13].

These companies also develop innovative solutions to improve asset value, production and operational efficiency, and safety. Their activities contribute to the success of the energy sector on the NCS, making Norway one of the leading O&G nations [31].

3.3.7 Trade Unions

Trade unions are crucial in Norway's labor market, especially in the O&G industry on the NCS. Most employees on the NCS are unionized, with the two largest trade unions, Industri Energi and SAFE, playing a vital role in safeguarding employees' rights and interests [35] [36].

Trade unions negotiate collective agreements, ensuring fair wages, benefits, and safe work environments. They provide employees with training and support, lobby for changes in labor laws and regulations, and promote social and environmental responsibility [35] [36].

Under the Norwegian Working Environment Act, companies with over 10 employees must have a safety representative. They represent workers' interests in work environment matters, notify management of hazards or health risks, participate in health and safety programs, and are consulted on decisions affecting the work environment [37].

3.3.8 Government and Authorities

To secure a safe operation and correct management of the values offshore, it requires rules and regulations. On NCS, there are several organizations that work with this, NPD, and PSA.

NPD is governmental agency who has the responsibility to manage and regulate the Norwegian O&G resources on NCS. It was established in 1972, where their main objective is to secure a safe, efficient, and environmentally responsible development of oil- and gas resources, as well as creating values for the society. The NPD’s functions also include collection and analyzing of data, advisor for the government and collaborating with other organizations on and stakeholders within the oil- and gas industry. Through their supervision of the industry, NPD plays a vital role to secure long-term resource management, contribution to the Norwegian economy and preserve the environment [38].

PSA is an independent governmental agency who has the responsibility of ensuring safety and working environment on NCS. It was established in 2004, where their main objective is to regulate, monitor, and secure safe and environmentally responsible operations in NCS. PSA oversees various aspects of the industry, including technical and operational safety, emergency activities, and work environmental health. The agency also plays a crucial role in preventing major accidents, reducing the risk for work related incidents, and responsible for the environment. By collaborating with stakeholders and enforce regulations, PSA ensures that the Norwegian petroleum sector maintain its high standards for safety and safety culture, environmental protection, and the workers well-being [39].

3.3.9 Personnel, competence, and training

To operate an O&G production asset, it requires a workforce within several disciplines. An operator is required to have personnel that are qualified and trained to operate the daily operations of the asset.

This personnel includes:

- Operational personnel: These are the people who will be responsible for the day-to-day running of the production asset. They will ensure that the production processes are running smoothly and efficiently and will work to optimize production rates and minimize downtime.
- Maintenance personnel (Mechanical, Electrical, Automation etc.): These are the people who will be responsible for maintaining the production assets and ensuring that it is in good working order. They will carry out routine maintenance tasks, perform repairs as required, and work to prevent breakdowns and other issues.
- Administration personnel offshore (Supervisors, technical leaders etc.): These are the people who have the responsibility for different areas of production. This includes supervisors or managers within operation, maintenance, Health, Safety, Environment and Quality (HSEQ), installation etc. Their work includes overseeing every operation and work tasks are performed in a safe and cost-efficient way with focus on quality. They also have the responsibility to report from field to onshore.
- HESQ personnel: These people oversee the HSEQ aspects of the operation. They are responsible for ensuring that the facility operates in compliance with all relevant regulations and that all employees are trained in safe work practices. [40]

The staffing and resources necessary for operating a production asset are determined by various factors, such as the asset's size and complexity, its location, and the regulatory context. Thorough consideration of these factors is crucial for devising an all-encompassing plan for staffing and resource allocation.

In addition, offshore life necessitates personnel who may not be directly engaged in day-to-day operations but still play a vital role.

This includes:

- Cleaning staff: For some production assets, cleaning staff may be needed to maintain a clean and orderly environment. Responsibilities can encompass sweeping, mopping, and general housekeeping tasks.
- Culinary staff: Responsible for meal planning, food preparation, cleanliness, inventory management, and food storage. Culinary staff ensure that meals are safely, efficiently, and satisfactorily served to all rig personnel.
- Medical staff: In certain situations, medical staff might be needed to deliver medical services to employees at the production asset. Their duties can range from providing first aid and emergency response to offering medical support for ill or injured workers.
- Pilot services: For offshore production assets, pilot services might be necessary to aid in navigating vessels near the asset. [40]

3.4 Risk

Risk is an inherent part of any industry, and the O&G sector are no exception. The exploration, production, and transportation of O&G involve numerous hazards and uncertainties that can have significant consequences for industry, the environment, and society. Understanding and effectively managing risk is crucial for ensuring the safety of personnel, protecting the environment, and maintaining the financial stability of companies operating in the O&G industry. Most NCS partnership contracts have included some regulations related to risk and reward. Any unexpected costs or profit should be split between the parties in a predetermined portion. This encourages the parties in the agreement to operate and maintain the asset in the best possible way. This can also backfire if the costs are higher than estimated [41].

The parties in the partnerships should determine contractual agreements related to all from risk and profit sharing, responsibilities, and requirements etc. However, the alliance parti that has the biggest stake in the project should also have a larger portion of the reward or costs. The goal should be to create a reasonable balance between the cost and profit to best fit the parties [41].

3.4.1 Risk sharing

To ensure that an alliance or partnership is optimized, the agreement needs to fulfill requirements that satisfy all parties, including clear understanding of their roles and responsibilities in the partnership. These roles should be determined early to establish an optimized framework for the partnership [41].

While risks are shared through agreements, it is important to note that the ultimate responsibility for safety lies with the operator company, as they are required to report to the government and authorities. This responsibility is reinforced by a legal obligation known as the "See to it" duty, which stipulates that the operator must ensure that their partners and contractors comply with government regulations and requirements. The licensee must take appropriate actions if the

conditions do not comply with regulations, thereby fulfilling their responsibility under the "See to it" duty [29].

In 2018, it was conducted an analysis of 22 investigations carried out by PSA on personal injuries and major near accidents on the NCS. The study aimed to examine the organizational complexity and the widespread use of contractors and subcontractors. Specifically, they investigated the inter-organizational causal factors identified in the offshore incidents under review [42].

Figure 10: *Report from PSA "Endrede rammebetingelser og konsekvenser for arbeidsmiljø og sikkerhet i petroleumsvirksomheten" [5].*

The report (Figure 10) highlights several issues that led to safety incidents in the O&G industry. One of the issues was unclear roles and responsibilities between personnel from different companies. This resulted in confusion during design, operational planning, and execution of work.

Another issue was the lack of proper processes to ensure sufficient competence over organizational interfaces. This led to a lack of specific experience and training, which could result in equipment being operated incorrectly. Additionally, inadequate quality control processes over organizational interfaces led to structural weaknesses in the final product. There were also breakdowns in communication between companies, leading to insufficient experience transfer and weak communication of changes or lack of availability of quality information [42].

The report highlights the importance of safety culture in the industry. Safety culture refers to the shared values, norms, and perceptions related to safety that develop within an organization as its members interact with each other and their environment. Good safety culture can lead to positive safety results. The report suggests that the underlying conditions in a company, such as how work is organized, can affect safety culture. The report emphasizes that good safety culture should be promoted and developed through shared values, norms, and perceptions [42].

The increasing fragmentation in the industry, with more outsourcing, nomadic work, and the use of contract work, has made it difficult to develop a shared safety culture. Fragmentation has reduced the opportunities for interaction and cooperation, which are necessary for developing shared values and norms. The report suggests that the industry should consider these issues when developing new safety programs and campaigns [42].

3.4.2 External risk

Some risk elements that should be determined are when marked fluctuations occur. An example is the oil crisis back in 2014-2016 illustrated in Figure 11, which had a major impact on the global economy. According to a report from the Norwegian government, the crisis was caused by a combination of factors, including an oversupply of oil on the global market, new technology, weak demand due to a slowdown in the Chinese economy, and the decision by Organization of the Petroleum Exporting Countries (OPEC) to maintain production levels in the face of falling prices. These factors led to a sharp decline in oil prices, which fell from over $100 per barrel in mid-2014 to below $30 per barrel by early 2016 [43].

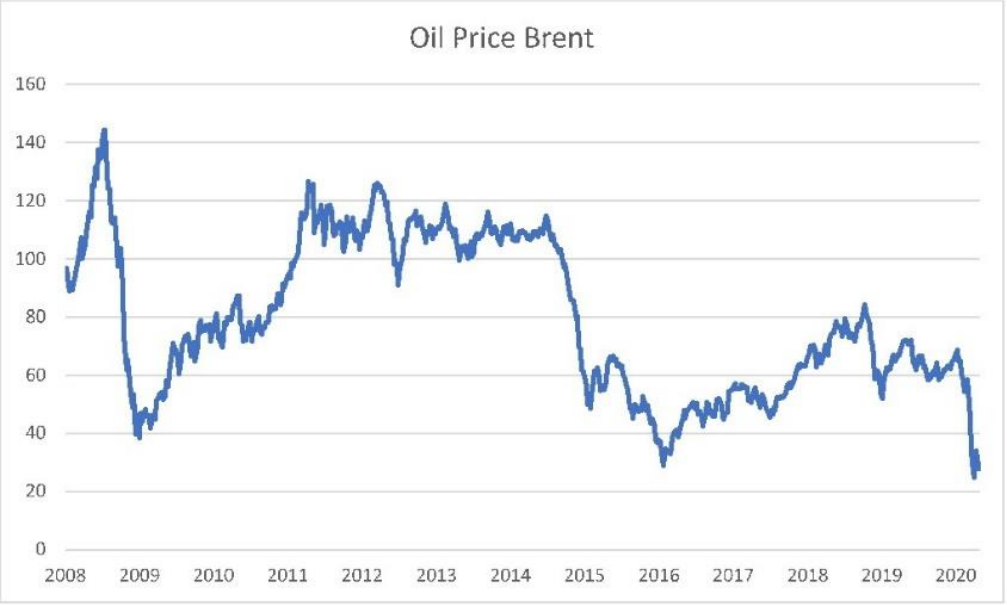

Figure 11: *FALLING OIL PRICE: The fluctuations in the oil price the last 12 years / Source: Bloomberg, DNB Asset Management [44].*

The Norwegian economy, which is heavily dependent on O&G exports, was particularly hard hit by the crisis. According to the report, the crisis led to a significant decline in government revenues, as well as a sharp increase in unemployment and a slowdown in economic growth. The report argues that the crisis highlights the need for Norway to diversify its economy and reduce its dependence on O&G exports [43].

The report discusses the implications of the oil crisis for wage formation in Norway. It argues that the crisis has led to a "new normal" in which wages are likely to grow more slowly than in the past. This is because the crisis has led to a structural shift in the economy, with slower growth and lower profitability in many sectors. As a result, the report argues that it will be necessary for unions and employers to work together to find new ways of managing wage growth, such as by linking wages to productivity or by introducing more flexible working arrangements [43].

Another risk is related to pandemic and oil prices. The Brent oil price experienced a significant downturn in 2020 due to the COVID-19 pandemic's impact on global demand for oil. The pandemic resulted in a reduction in economic activity, travel restrictions, and a decline in industrial production, leading to a sharp reduction in oil consumption. As a result, oil prices plummeted, with Brent crude oil prices falling by more than 65% from the beginning of the year to April 2020.

The pandemic's impact on oil prices was exacerbated by a price war between major oil-producing countries, including Saudi Arabia and Russia. The two countries, along with other OPEC+ members, failed to reach an agreement on production cuts, leading to a flood of oil supply in the market just as demand was falling. This led to an oversupply of oil and further downward pressure on prices [45].

The sharp decline in oil prices in 2020 as illustrated in Figure 12, caused by the COVID-19 pandemic and the price war between major oil-producing countries, resulted in a reduction in investment in new oil production projects. This trend could potentially lead to a supply shortage in the future once demand for oil recovers. Moreover, there is a shift towards renewable energy sources and the increasing adoption of electric vehicles, which could lead to a long-term decline in oil. These factors may have a significant impact on the oil industry's future and highlight the importance of transitioning towards sustainable and renewable energy sources [45].

Figure 12: *Brent Crude Oil Price 2018-2023 [46].*

Overall, the COVID-19 pandemic, along with the price war between major oil-producing countries, were the primary factors contributing to the sharp downturn in Brent oil prices in 2020. The risks that are mentioned are risks that come from external forces such as pandemic and marked fluctuations. The risk from internal forces could be accidents or incidents on the platform, that can result in catastrophic events. This could be human accidents where the worst case can result in death, but also production incidents that can result in production shut down. Another perspective is the environment which can also be affected by accidents on the platform [45].

3.4.3 Internal risk

Working safely is essential for both workers and employers in any industry. Not only does it help prevent accidents and injuries, but it also promotes a culture of responsibility and accountability. An important term within the safety in the industry is tripartite cooperation.

Tripartite cooperation refers to collaboration between employers, employees, and regulatory authorities illustrated in Figure 13. This approach recognizes that all parties have a role to play in promoting safety and preventing accidents. Employers have a legal responsibility to provide a safe working environment, while employees have a responsibility to follow safety rules and procedures. Regulatory authorities have a responsibility to oversee and enforce safety regulations [29].

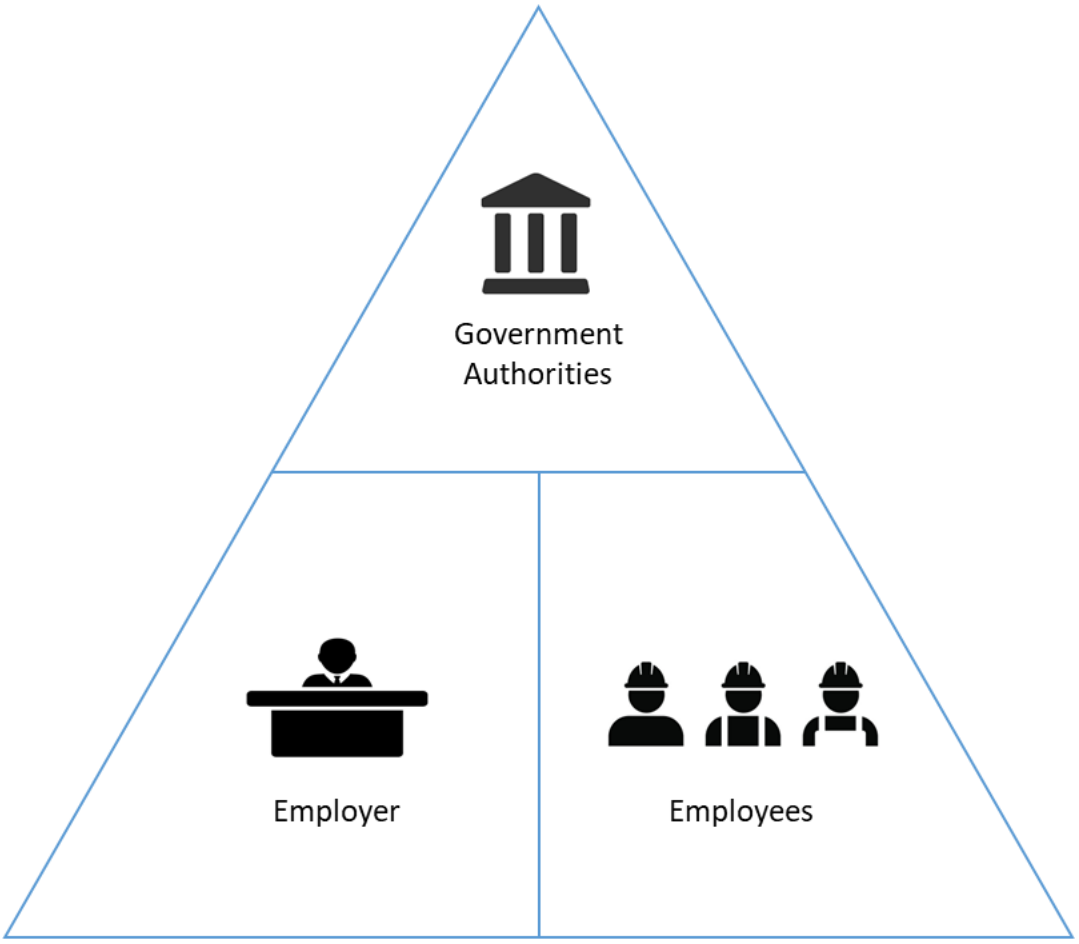

Figure 13: *Tripartite cooperation illustration [47].*

Before starting any work, a thorough risk assessment should be conducted to identify potential hazards and develop strategies to mitigate them. A strong safety culture is essential for promoting safe working practices. This involves fostering an environment where safety is a top priority, and everyone feels comfortable reporting hazards or near-misses. Employers must provide adequate training and ensure that workers have the necessary competence to perform their jobs safely. Safety should be an ongoing process, with regular evaluations and improvements to procedures and equipment [29].

By following these principles and working together, employers, employees, and regulatory authorities can help ensure a safe working environment for everyone in the O&G industry [29].

Being proactive in identifying and mitigating risks, optimizing operations, and offering alternative solutions, and maintaining open communication with the operator company, it can ensure safety for all parties and maintain a competitive advantage in the O&G industry. To ensure effective risk management, operators, partners, and contractors should establish a robust framework through contractual agreements.

3.5 Contract agreements

According to the report from PSA, a contract has several functions. In addition to ensuring the correct delivery for the correct price, it is also a tool of how to prevent and manage conflicts in terms of the companies' obligations and rights. The contracts also need to define the collaboration between the parties that includes what tasks, roles, and responsibilities the different parties have, in the term of what activities that shall be carried out. These three functions can be considered to belong to different domains, referred to as the economics, legal and business model domain illustrated in Figure 14 [5].

The field of economics deals with the commercial aspects of exchanging goods and services, including how payments are made, incentive plans, cost distribution, and risk sharing. The field of law is concerned with ensuring compliance with contracts, including the obligations of the parties involved, how decisions are made, and what actions will be taken if there is a breach of contract. It also involves managing and resolving disputes and ensuring that all parties understand the requirements of the contract [5].

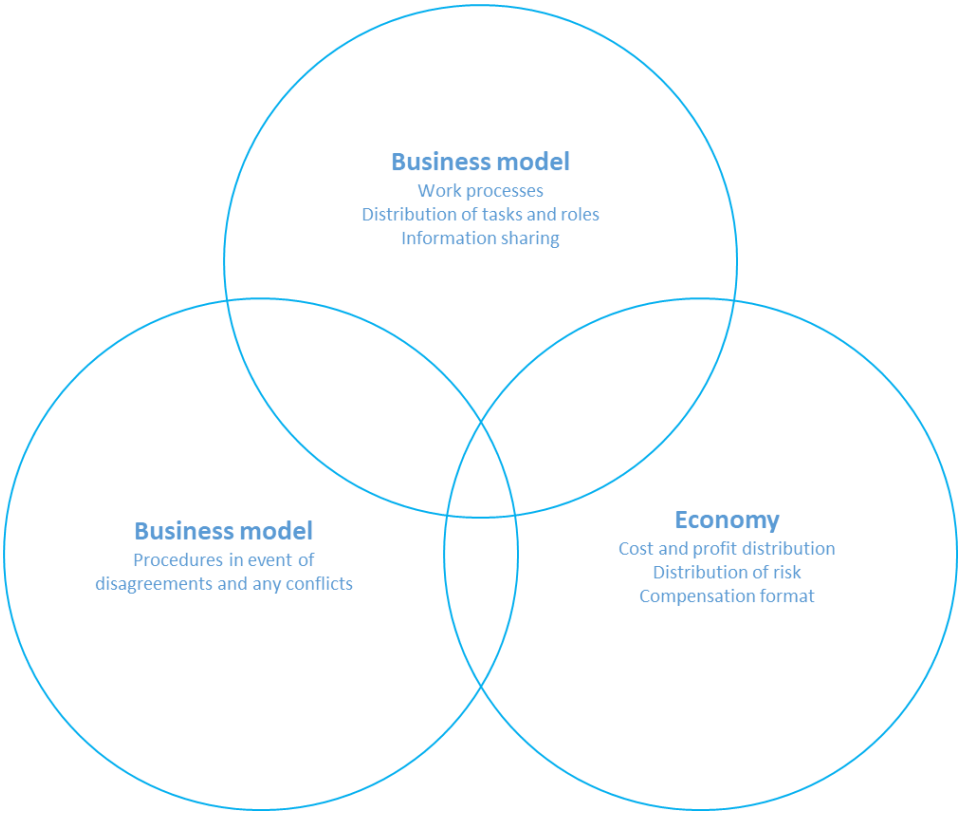

Figure 14: *Different contracts domains [5].*

The domain of business models focuses on how goods or services are produced or exchanged. This includes details about how the activity is organized, management systems, ensuring safety in the workplace, work processes, and organizational roles. These fields are not mutually exclusive categories, and there can be overlap between them. For example, incentive systems in the economic domain may be related to the practices exercised in the operating model domain [5].

The document titled "Changed Framework Conditions and Consequences for Working Environment and Safety in Petroleum Operations / ST-16962-3" explores how alterations in the conditions for petroleum operations will affect the safety and working environment [5].

3.5.1 Contract Agreements, Safety and Working Environment

Within the legal domain, responsibilities related to work environment and safety can be defined. Safety and safety management requirements may be directly and indirectly included in contracts, which can involve risk sharing (determining who owns various risks), liability in the event of an incident, and the use of sanctioning instruments. Explicitly stated work environment and safety-related issues may also be related to the economic domain, such as incentive schemes designed to promote safety and a good work environment. Within the business domain, safety and work environment-related factors may also be explicitly expressed in terms of requirements for the use of management systems, standards, competence requirements, employment conditions, etc. [5]

Regarding risk management related to major accidents and work environment, there is uncertainty related to:

- Whether the requirements imposed have the intended effects.
- Whether the implications of individual requirements, or the totality of requirements included in the contract, have unintended negative or positive consequences for major accident and work environment risk.

Increased integration of the economic, legal, and business model domains as part of contract strategies entails increased complexity and associated uncertainty [5].

In addition to the conditions that are explicitly defined in contracts, it is reasonable to assume that the total contract lays down guidelines for the extent to which various actors in a supplier can contribute to keeping major accidents and work environment risks under control. This includes actors at both strategic/tactical and operational level. These levels include leaders or management on strategic level, tactical level, and operational levels, as well as the operators [5].

3.5.2 Contracts type

Contracts agreements could be separated into four different contracts:

1. Classic
2. New-classic
3. Relational agreements
4. Alliance agreements

Classic contracts are primarily used for individual agreements and for the purchase of goods and services for a limited period. They focus on the rights and responsibilities of each party. New classic contracts are commonly used for services where it is difficult to precisely define the deliverables

beforehand. These types of contracts include procedures for how the parties should handle uncertainty and potential conflicts. Relational contracts are used when the deliveries are based on long-term cooperation between the parties. Like new classic contracts, they also emphasize the handling of uncertainty and possible conflicts. These types of contracts will include descriptions of how the collaboration will be practiced. Alliance contracts are designed to promote mutual interests and objectives among the parties involved. They emphasize a closely integrated collaboration between the parties, and the contract terms are geared towards achieving common goals [5].

3.5.3 Compensations, incentives, and performance indicators

There are four main types of compensation formats: fixed price, unit price, cost plus, and target sum. A fixed price contract involves the supplier being paid a set price for the service/assignment, possibly within a specified time frame. The use of a unit price means that the supplier is paid for the number of units produced. These units can be hours worked, number of deliveries, number of meters, number of square meters, etc. With a cost-plus contract, the supplier is compensated for all costs associated with the assignment, plus an agreed profit margin. A target sum means that the client and supplier share any excess or savings based on a predefined reference price or production target [5].

These different compensation formats involve different distribution of risk between the client and supplier. The contracts can also include various incentive systems designed to encourage a certain type of performance by the supplier. The incentives can be positive or negative, i.e., they are intended to reward or punish the involved parties, respectively. Positive incentives can include bonuses for achieving goals, profit sharing, and opportunities for new contracts and assignments. Negative incentives can be daily fines, charges for costs that exceed price estimates, termination of contracts, etc. [5].

The incentive schemes can be based on various performance indicators (Key Performance Indicators (KPI)). In addition to being a basis for incentive systems, performance indicators may aim to control that aspects of the business are following goals or requirements. Another application is to use the indicators to analyze trends or compare operations/activities with respect to improvements [5].

There are various types of compensation formats that can be used in contracts, including:

1. Time and material: the operator company bears the financial risk.
2. Norm price: the supplier bears the financial risk.
3. Fixed price: the supplier bears the financial risk.
4. Performance-based model: sharing of financial risk - the contractor sets the time.
5. Target budget: sharing of financial risk - the contractor sets the time.

The use of fixed prices for comprehensive deliveries is less common among most operators. The unit rates can be based on different parameters such as the number, area, length, volume, etc., and the pricing is based on a norm price. The distribution between hourly and unit rates may vary among operators and between installations within the same operator [5].

Several operator companies aim to perform most of the contracts using the performance-based model, where the contractor sets the time for a job and is responsible for completing the task within that time. For some operators, the downside in contracts for the contractor is greater than the upside (possible increase: +12% to possible reduction: -24%) [5].

3.5.4 Contractual challenges

The report delves into contract models in various sectors, including drilling and well services. Performance incentives are common in contracts, but the threat of penalties can induce underreporting of incidents. This issue necessitates a re-evaluation of contracts, encouraging honest reporting while ensuring balanced penalties. For safety enhancement, contracts should adopt more qualitative measures, like safety procedures and hazard management. Open communication and collaboration on safety matters can further bolster this approach [5].

Service companies report increased reporting requirements, providing valuable data but increasing workload. While some operators allow flexibility and collaboration, others exploit contracts for cost-saving, transferring risks onto suppliers. The study notes a recent shift towards alliance contracts, emphasizing early involvement and integration. There's a focus on long-term relationships due to scarce supplier capacity [5].

Contracts now separate operation and maintenance from modification projects. Varying activity levels require temporary hires, posing competency and safety challenges. Around 2010, contracts introduced unit rates for compensation, leading to issues with escalating costs not considered in contracts. Contracts may also enable operators to change norms to their benefit [5].

According to the PSA report, contract unpredictability leads to increased temporary positions and financial risk for service companies, affecting competence building and efficiency [5].

4 Data collection

This chapter focuses on the data collection process for analyzing the Asset Partner business model in the O&G industry on the NCS. Using a qualitative approach, professionals from different roles on NCS, including operator companies, trade unions and oil service company. The participants in the different roles were asked the same questions, with follow-up questions as needed.

The responses were based on their personal experiences and opinions. The participating oil companies were categorized into large, medium, and small operators based on the number of production licenses held. The trade unions that participated were the two largest organizations on NCS, and lastly the professionals that represented the oil service company were employees in Moreld Apply.

4.1 Interview guide – Questions

The research design aimed to gather comprehensive insights from key stakeholders in the O&G industry. The data collection focused on conducting interviews with representatives from operator companies, trade unions, and professionals from an oil service company. The selection of participants was based on their expertise, experience, and involvement in the industry, ensuring the richness and relevance of the collected data.

The interview guide was developed with a thorough understanding of the Asset Partner model and its customization requirements. It aimed to investigate valuable insights, perspectives, and challenges related to forming a partnership model. The questions were designed to address specific aspects of the model, taking into consideration the expertise and knowledge of the participants. Prior to developing the interview guide, a literature review was conducted to gain a comprehensive understanding of the relevant topics and areas of investigation.

The data collection process involved conducting individual interviews with representatives from operator companies, trade unions, and an oil service company. The interviews were conducted either physically or via Microsoft Teams, depending on the participants' preferences. The interviews were recorded with the participants' consent to ensure accuracy during the analysis phase.

The selection of participants was based on purposive sampling, aiming to include individuals with diverse roles, experiences, and perspectives. Representatives from operator companies were selected based on their involvement in offshore operations and decision-making processes. Trade union representatives were chosen for their extensive knowledge of labor relations and the

impact of partnership models on workers. The oil service company participants were selected based on their expertise in offshore operations and experience in partnerships within the industry.

The recorded interviews were transcribed verbatim, and thematic analysis was employed to identify recurring patterns, themes, and insights. The data analysis process involved systematically organizing and categorizing the data to identify key findings and perspectives. The themes and patterns that emerged from the analysis were then compared to identify similarities, differences, and areas of convergence.

The methodology employed in this study enabled the collection of rich and diverse perspectives from operator companies, trade unions, and an oil service company regarding the Asset Partner model. The development of the interview guide, the literature review, and the systematic data analysis process contributed to the robustness of the findings. By incorporating feedback from participants and seeking expert validation, the study ensured the credibility and reliability of the collected data. The insights gained from this methodology form the foundation for the subsequent chapters, providing valuable insights into the Asset Partner model and its implications for the O&G industry.

4.2 Participants

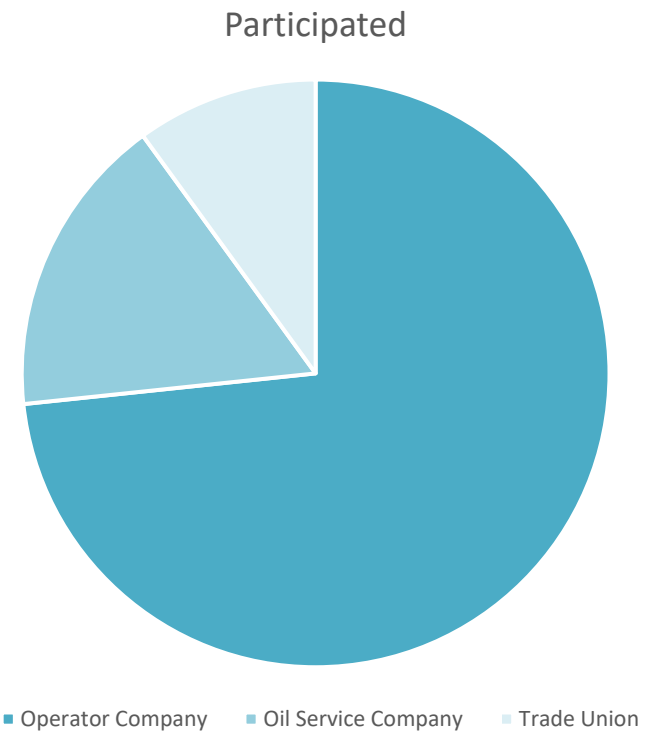

Figure 15: *Participation from Operator companies, Oil service companies, Trade unions.*

Figure 15 illustrates the composition of participants in the data collection process, featuring 22 professionals from operator companies, three from trade unions, and five from oil service companies all contributing to the analysis.

4.2.1 Operator Companies

All the operator companies on NCS listed in Table 2 was contacted and requested to participate in this analysis.

Table 2: *Operator companies on NCS [48]*

Company	Licensees	Operatorship	Operatorship field
A/S Norske Shell	20	7	1
Aker BP ASA	191	128	20
Concedo AS	14	0	0
ConocoPhillips Skandinavia AS	46	22	10
DNO Norge AS	76	13	1
Equinor Energy AS	302	212	62
Harbour Energy Norge AS	18	5	0
INPEX Idemitsu Norge AS	34	1	0
KUFPEC Norway AS	11	1	0
LOTOS Exploration and Production Norge AS	36	0	0
Lime Petroleum AS	20	0	0
Longboat Energy Norge AS	15	0	0
M Vest Energy AS	20	0	0
Mime Petroleum AS	6	0	0
Neptune Energy Norge AS	55	18	3
OKEA ASA	43	23	2
OMV (Norge) AS	36	12	0
PGNiG Upstream Norway AS	62	9	0
Pandion Energy AS	30	0	0
Petoro AS	180	0	0
Petrolia NOCO AS	13	1	0
Repsol Norge AS	13	5	3
Source Energy AS	13	0	0
Sval Energi AS	73	8	2
TotalEnergies EP Norge AS	57	7	2
Vår Energi ASA	157	53	5
Wellesley Petroleum AS	17	4	0
Wintershall Dea Norge AS	95	27	4

Table 2 provides an overview of the companies operating on the NCS and the number of licensees, operatorships, and operatorship fields they held at the end of 2022 [48].

The companies operating on the NCS may be categorized as large, medium, and small operators based on the number of production licenses they hold. A large company holds more than 50 licenses, while a medium-sized company holds between 20 to 50 licenses, and a small company holds fewer than 19 licenses. Data on these companies was collected from a sample of 13 organizations, with nine classified as large companies, three as medium-sized companies, and one as a small company.

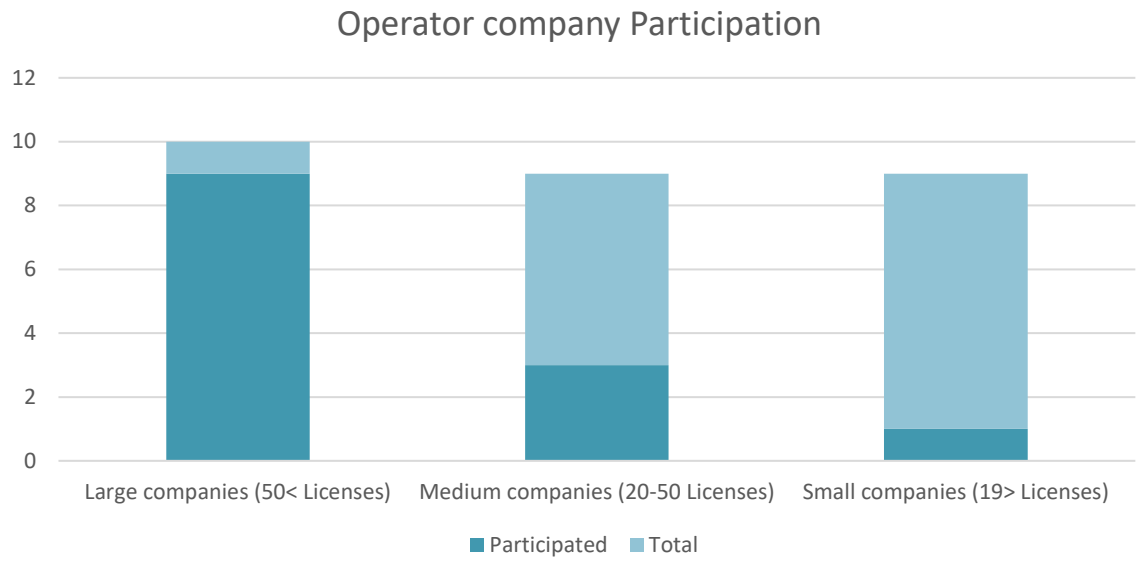

Figure 16: *Operator company participation categorized into large, medium, and small companies.*

Figure 16 visualize the participation of the total number of operator companies on NCS based on their holding of licenses. The professionals that were interviewed were people in the management division or in management positions related to asset management, operation, or production management.

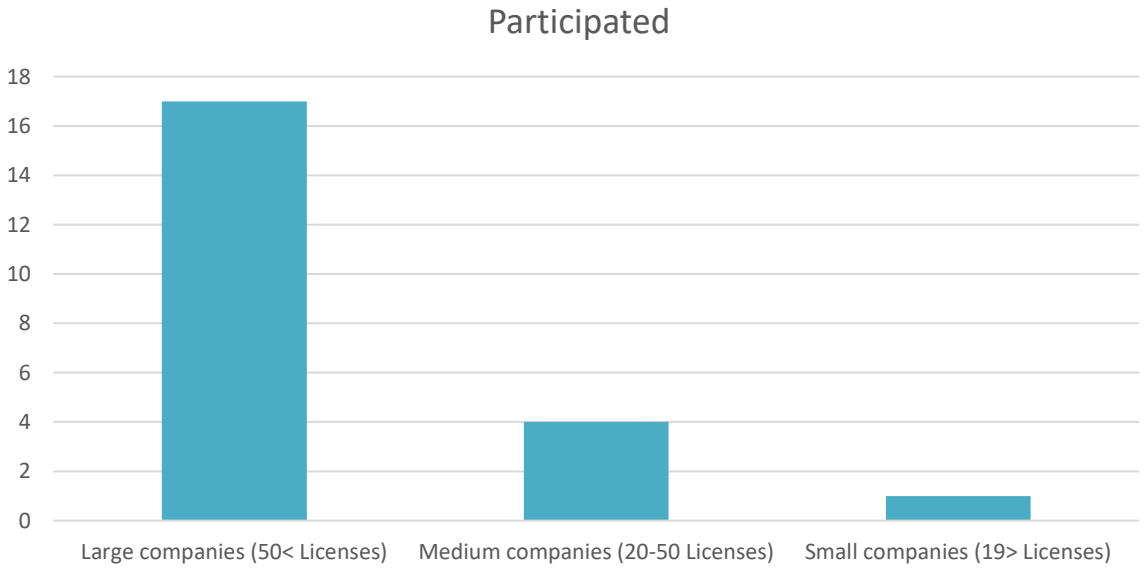

Figure 17: *Professionals participated in the analysis categorized into large, medium, and small company.*

A total of 22 industry professionals with broad experience ranging from 20-40+ years in asset management, production management, and operations management provided the data. The contribution of these individuals carries considerable weight in the analysis. The 22 professionals represented companies of different sizes, with some being large, medium, and small. As expected, the participation of professionals from large companies was higher compared to those from smaller ones as Figure 17 visualize. This is because more large companies responded to the request for participation in the analysis. A reason for this could be more available resources in the larger companies than the smaller once. This analysis involved contacting a total of 89 professionals, but ultimately only 22 professionals from 13 companies participated. This means that many of the contacted professionals either did not respond or were unable to participate.

4.2.2 Trade Unions

Industri Energi and SAFE, the two predominant trade unions on the NCS, were invited to participate in an interview about the Asset Partner model. Three experienced representatives, each with over 20 years in trade union roles or related areas, agreed to provide their insights. These individuals held management positions within the unions or served as company representatives for the company they worked for. The representatives also have great experience of O&G at NCS, where they all came from before their involvement with the trade unions.

4.2.3 Oil Service Company

From the perspective of the oil service company, five representatives from Moreld Apply participated, each possessing extensive experience in offshore operations and partnerships in various areas. The company has a significant presence in the NCS, which is currently its largest business area. They also engage in onshore projects and industries beyond O&G. The individuals who took part in this analysis have either previously worked for an operator and are now a part of the oil service company or have spent their entire careers in oil service.

All participants possess an in-depth knowledge of offshore operations and offer valuable insights into the industry, which can enhance the comprehension and requirements of this type of service model. Including participants with experience from both the operator and oil service sides provides a balanced perspective for the analysis. These participants hold management positions within the company, with some also serving as members of the company's management team.

4.2.4 Government and Authorities

This research involved reaching out to the NPD and PSA in the same manner as other participants, requesting an interview following a set interview guide. Despite their inability to partake in the interview due to time limitations, these organizations participated in the data collection process by supplying relevant documents that proved valuable to the study.

The documents provided from PSA where related to changed framework conditions and consequences for the working environment and safety in petroleum operations on the Norwegian continental shelf. This report examined the implications of changing regulatory conditions for suppliers within the petroleum industry with regards to employment conditions, employee participation, working environment, and safety, mainly focused on the business areas drilling operations, drilling and well service, maintenance/modifications and insulation, scaffold, and surface treatment.

The other report that was provided was a request from a company where PSA is giving feedback to the request. The request and answers provide valuable insights into the perspective of PSA of distribution of roles and responsibilities within the petroleum industry to a contractor. It emphasizes the capacity of a central contractor to assume various critical roles on behalf of the operator, an approach that aligns closely with the shared responsibilities related to the Asset Partner model.

Although the request about the Asset Partner model was not addressed, information was provided that could be utilized to interpret their perspective on such a model.

5 Analysis and Results

This chapter presents the key findings derived from interviews conducted with stakeholders in the O&G industry. This chapter provides an analysis of the data collected from operator companies, trade unions, and an oil service company, focusing on their perspectives on the Asset Partner model. The interviews offer valuable insights into the challenges, opportunities, and potential benefits associated with this partnership model. The core findings from the interviews will be incorporated in the analysis chapter. For a more in-depth and thorough examination of the interviews, please refer to the appendix.

5.1 Data collection – Operator

This chapter presents the summary of the findings from the data collection process conducted with operator companies operating within the NCS. The aim of this data collection was to gain insights into the perspectives, challenges, and potential benefits associated with the implementation of the Asset Partner model in the O&G industry. For a more comprehensive and detailed data collection, see Appendix 1.

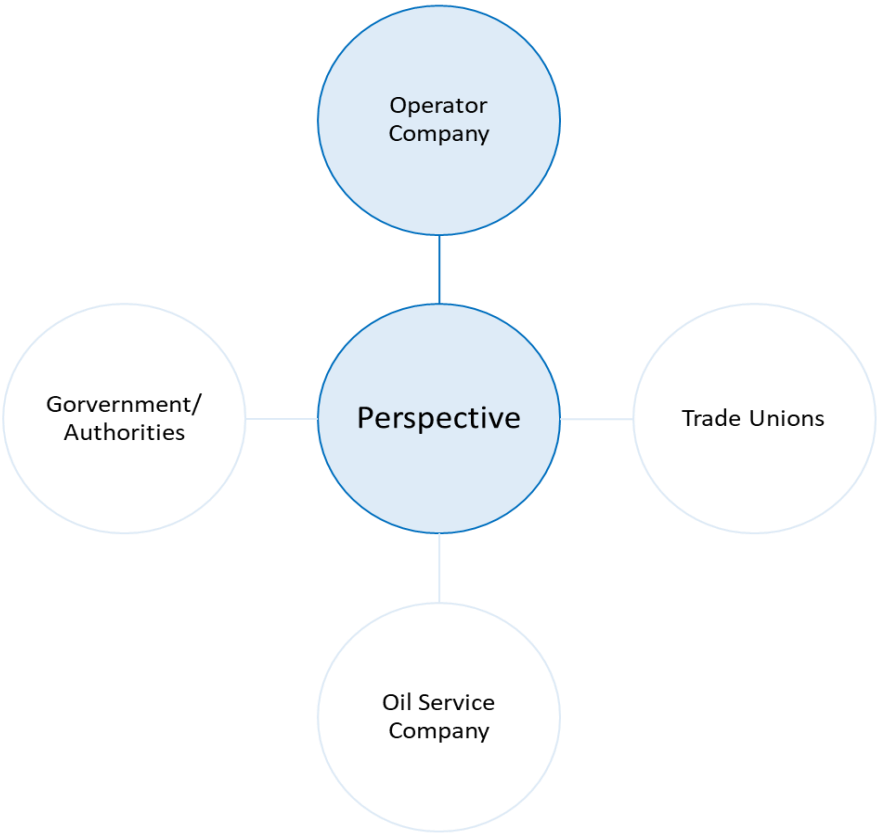

***Figure 18**: Perspective of **Operator company**, Trade unions, Oil service Company, Government/Authorities.*

For outsourcing operations and maintenance, a supportive regulatory framework, compliance with safety and environmental regulations, financial viability, and thorough evaluation of the third-party company's stability, reputation, and capabilities are crucial. Clear contractual agreements outlining roles, responsibilities, performance requirements, risk distribution, and liability matters are essential for successful partnerships. Trust, collaboration, shared values, open communication, and clear performance metrics contribute to effective outsourcing.

Expectations for a third-party company include a clear framework for risk management, cost optimization without compromising quality, production optimization, minimizing losses, operational efficiency, reducing the carbon footprint, and incidents management. Clear contracts, incentive structures, and a safety culture are vital for successful partnerships.

Asset partnerships are most relevant during the late-life/end-life phase and decommissioning, prioritizing cost reduction, maximizing production, and efficient resource management. Smaller Exploration and Production (E&P) companies and specialized organizations commonly engage in these partnerships, while larger operators tend to handle early-life and mid-phase assets internally. Collaboration opportunities also exist in early-life and mid-phase stages.

A cost-efficient partnership with an Asset Partner requires a diverse and skilled in-house team comprising technical, financial, and legal experts. Collaboration between the operator and partner representatives is crucial for effective communication. Roles such as production engineers, commercial resources, contract managers, Asset Managers, and senior staff for maintenance, operations, and HSE management contribute to successful partnerships.

Companies in the O&G sector have varying approaches to sustainability, ranging from active pursuit of green technologies, and reducing production to optimizing current operations. The transition to renewable energy sources will impact employees, with a need to balance the expertise of the older generation with the enthusiasm of younger employees. Recruitment challenges may arise, but natural attrition is expected to help balance the workforce. Companies prioritize hiring employees with skills relevant to renewable energy projects, leading to a shift in the workforce composition.

The Asset Partner model offers opportunities and challenges in the green transition, enabling operational efficiency, expertise exchange, and specialization. However, challenges related to differing transition strategies and financial viability exist, along with concerns about commitment to actively support the green shift. The model is more applicable in late-life projects, wind farms, and Carbon Capture and Storage (CCS) facilities where automation and smaller units reduce risks. Success depends on the competencies and contributions of Asset Partners in the green energy sector.

Strategies for managing partnerships in response to market fluctuations and the energy transition include maintaining sustainable operations, prioritizing health, safety, and environmental aspects, considering price assumptions, reducing costs, ensuring robust contracts, and investing in profitable projects like renewable energy initiatives. Risk-sharing culture, flexible staffing, and efficient task division are emphasized, along with long-term regional perspectives and predictable contracts.

Opinions regarding the suitability of the Asset Partner model in the O&G industry vary. Some see potential benefits for smaller companies with lean organizations, while others express concerns about risk management and the need for a clear win-win scenario. The model is seen as more applicable in late-life projects, decommissioning, and renewable energy sectors, provided there is a concrete framework and positive response from authorities. Concerns about loss of control and internal competence retention are also mentioned.

Figure 19 This graph illustrates the distribution of responses from companies of varying sizes, categorized as large, medium, and small, to the question, "*Could you in the future look at the Asset Partner-model (AP) to be an alternative into your O&G portfolio?*"

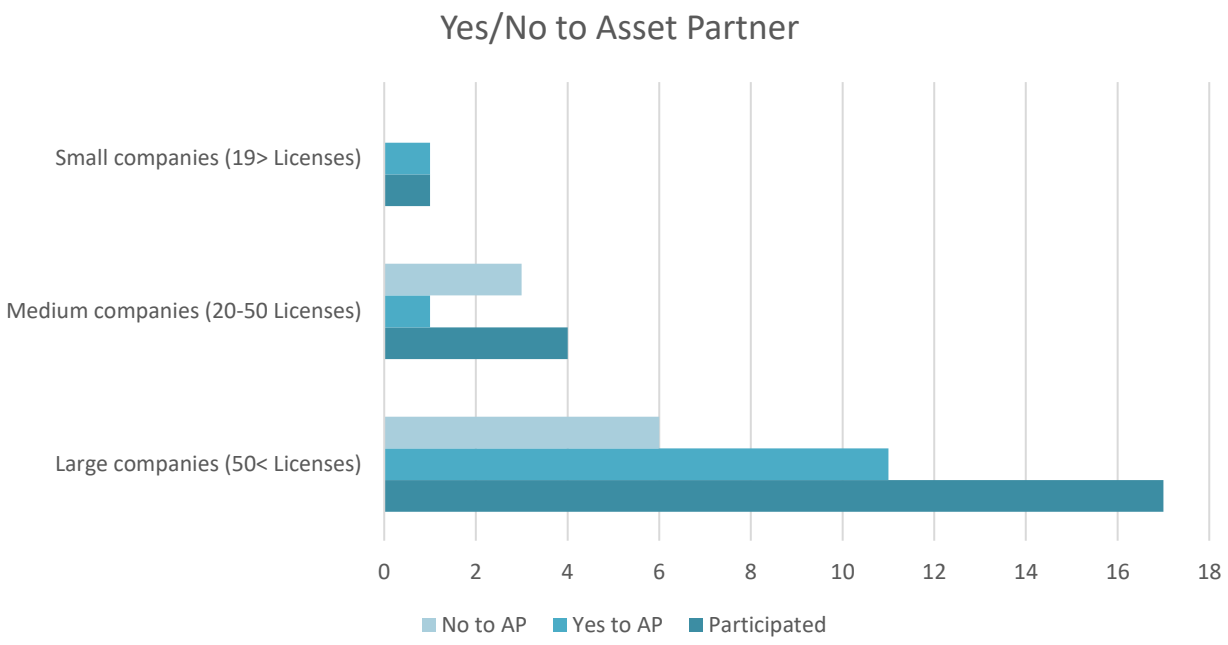

Figure 19: *Graph of Operators Yes/No to Asset Partner model.*

5.2 Data collection – Trade unions

This chapter presents the findings from the data collection process conducted with Trade unions represented on the NCS. The aim of this data collection was to gain insights into the perspectives, challenges, and potential benefits associated with the implementation of the Asset Partner model in the O&G industry. For a more comprehensive and detailed data collection, see Appendix 2.

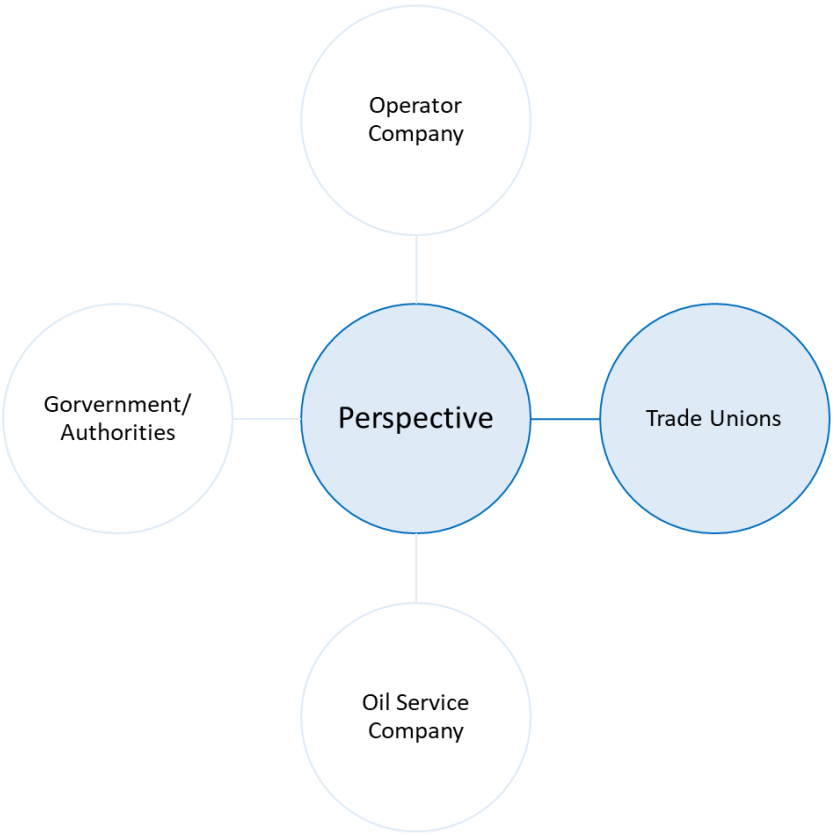

Figure 20: *Perspective of Operator company,* ***Trade unions****, Oil service Company, Government/Authorities.*

Trade unions recognize the advantages of outsourcing, such as cost savings and access to specialized expertise. However, concerns arise regarding the loss of loyalty and expertise among outsourced workers and safety challenges. Loyalty, risk-sharing, compliance with laws and regulations, and openness are vital for good cooperation between employees and employers in outsourcing partnerships.

Comparing outsourcing in Norway to other countries, differences exist in worker participation, regulatory frameworks, leadership priorities, and cultural dynamics. Worker participation and regulatory adherence contribute to successful outsourcing partnerships.

Trade unions express concerns about certain aspects of outsourcing on the NCS, such as contractual models that transfer financial risk and uncertainty for the workforce. There are worries about the erosion of national expertise and potential risks to safety and long-term performance.

The role of trade unions in protecting workers in outsourcing situations includes assessing the need for outsourcing, advocating for fair treatment, addressing concerns, and ensuring necessary framework conditions for occupational health and safety. Trade unions work within existing company structures and utilize internal systems to advocate for all employees.

The impact of the green shift on workers and outsourcing practices is complex. While companies are involved in green initiatives, the extent of outsourcing in the future is uncertain. The green transition may involve fewer employees and lower profit margins, potentially impacting safety regimes. The green shift brings positive changes but also trade-offs and challenges.

Trade unions believe that the impact of the green transition on outsourcing will be limited, with client companies driving workplace development. Scaling down onshore industries to support offshore operations may be necessary due to limited power capacity. Companies are expected to prioritize their own employees and seek profit opportunities.

Overall, trade unions emphasize the importance of maintaining safety, worker engagement, and compliance with regulations in outsourcing practices. They play a crucial role in protecting workers' rights and advocating for fair treatment in outsourcing situations.

5.3 Data collection – Oil Service Company

This chapter presents the findings from the data collection process conducted with Oil service companies within the NCS. The aim of this data collection was to gain insights into the perspectives, challenges, and potential benefits associated with the implementation of the Asset Partner model in the O&G industry. For a more comprehensive and detailed data collection, see Appendix 3.

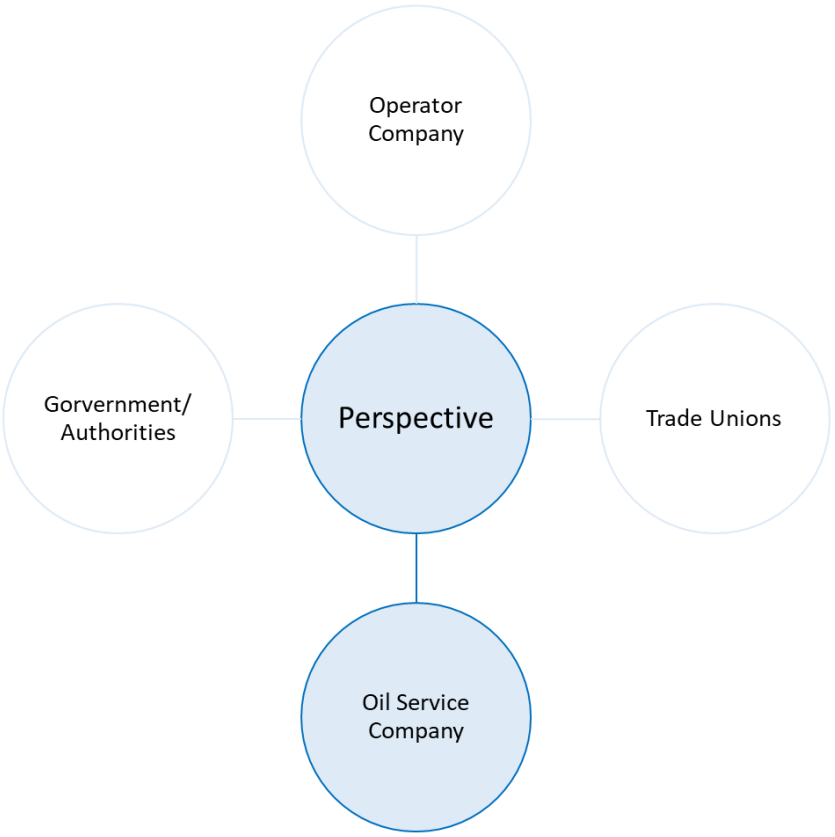

Figure 21: *Perspective of Operator company, Trade unions,* ***Oil service Company****, Government/Authorities.*

The operator company holds overall responsibility for regulatory compliance and management, while the Asset Partner focuses on day-to-day operations and specific functions defined by the operator. The extent of responsibility given to the Asset Partner varies based on preferences, project requirements, and contractual agreements. The operator retains ultimate responsibility and accountability to regulatory authorities.

Risk management in the partnership model lies primarily with the operator company, although the Asset Partner shares some risks. Contractual agreements, penalty structures, and regular risk management meetings help manage financial, HSE, and commercial risks.

Developing a shared safety culture in the partnership model involves adopting existing safety programs, integrating HSE models, and fostering open communication. Proactive measures like

workshops, campaigns, incident follow-up, and regular meetings promote a safety-centric mindset and eliminate any "A-team" or "B-team" dynamic.

Managing market fluctuations in the partnership model requires establishing stable contract frameworks that ensure base staffing and costs remain unaffected by market swings. Asset Partners focus on operational aspects, while joint decisions on prioritization, OPEX, and CAPEX are made with the operator to maintain stability. Regular discussions, evaluations, and collaboration optimize investments and maintain efficiency during changing market conditions.

Ensuring compliance with regulations and safety protocols in the partnership model is a shared responsibility between the operator and the Asset Partner. The operator retains overall responsibility, while the Asset Partner must understand and follow relevant regulations. Internal assessments, external audits, transparency, and clear communication help establish a cohesive compliance framework.

Worker training and competence in the partnership model are shared responsibilities between the operator and the Asset Partner. The Asset Partner develops comprehensive training programs aligned with the operator's requirements, retains experienced personnel, and offers incentives during transitions. A robust competence framework, collaboration, and monitoring progress ensure workers have the necessary skills to perform their jobs safely.

Efficient operations and equipment optimization in the partnership model involve setting KPIs, fostering collaboration, efficient meeting management, open discussion, shared understanding of goals, and a focus on profitability. Asset preservation, cost minimization, continuous improvement, and documented improvement initiatives contribute to maximizing efficiency.

Cost and profit-sharing expectations in the partnership model include fair and transparent risk-sharing arrangements, long-term contracts, balance between OPEX and CAPEX responsibilities, performance-based compensation, open-book approach, and transparency.

Advantages of the partnership model include reduced costs, access to expertise, predictability, adaptability to industry changes, and business expansion opportunities. Challenges include complex agreement processes, talent retention, trade union concerns, and ensuring quality and safety aspects.

Overall, the partnership model offers benefits such as expertise access, cost reduction, efficiency improvement, HSE focus, and collaboration. However, considerations regarding control, operating costs, and alternative models need to be evaluated for the specific circumstances to determine the most suitable approach.

5.4 Data Collection – Government and Authorities

This chapter presents the findings from the data collection process conducted with Government and Authorities within the NCS. The aim of this data collection was to gain insights into the perspectives, challenges, and potential benefits associated with the implementation of the Asset Partner model in the O&G industry.

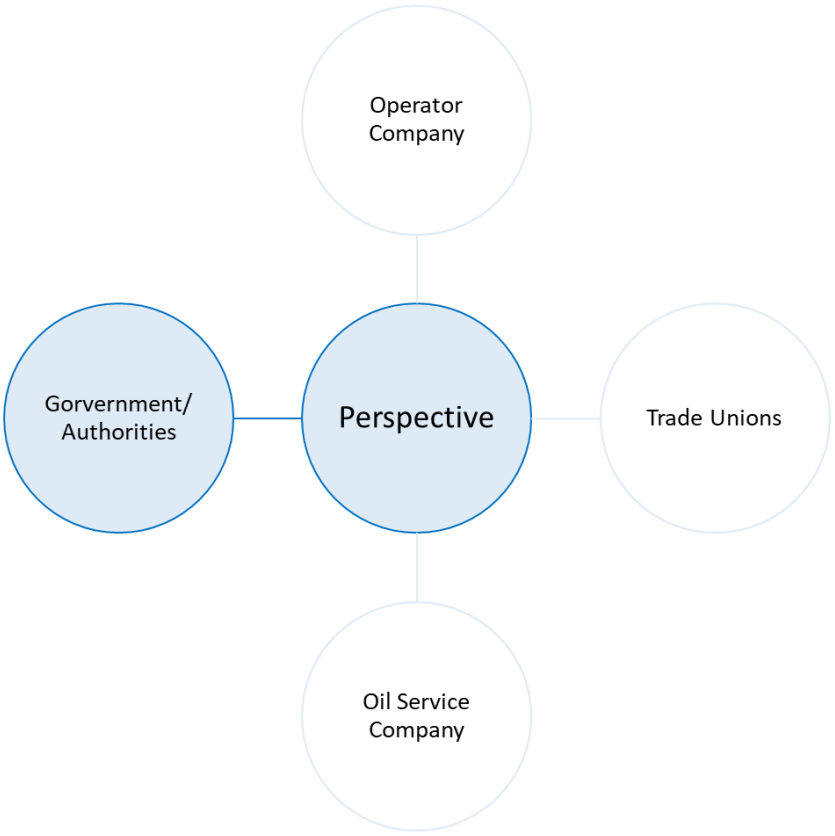

Figure 22: *Perspective of Operator company, Trade unions, Oil service Company,* ***Government/Authorities.***

In this study the NPD and PSA were contacted in the same way as the other participants and were requested for an interview with a predefined interview guide. The two organizations did not have the time to participate in the interview but sent some documents that were relevant to the study.

By NPD they only referred to the Norwegian Petroleum Act which provides the legal bedrock upon which petroleum activities on the NCS are conducted. It delineates a clear set of principles and regulations that operators must adhere to. To conduct operations on the NCS, operators must first obtain a production license from the Ministry of Petroleum and Energy. This license is a comprehensive document outlining the authorized areas for petroleum activities and the conditions under which these activities must be performed.

Safety, health, and environmental (HSE) regulations form a significant part of these activities. Operators are mandated to follow all relevant HSE regulations during their operations on the NCS. Oversight and enforcement of these regulations fall under the purview of the PSA. Operators are

required to have an emergency response plan, constantly tested, and updated, in place to ensure a timely and effective response in case of any incident.

PSA clarifies that while operators may outsource operational activities on the NCS, they retain the overarching responsibility regardless of any third-party involvement. An operator's obligation for oversight (“See to it” duty) cannot be waived, thereby making it challenging to outsource offshore activities due to high risk and oversight responsibilities.

While operators are free to decide their operational approaches within the set regulatory framework, the ultimate responsibility remains with them even when operations are delegated to a third party. This model could be relevant, provided all rules and regulations are upheld, regardless of who operates, aligned with the Norwegian Petroleum Act.

The PSA does not directly assess the optimal functioning of this relationship between operators and oil service companies concerning authorities' requirements. The PSA is tasked with overseeing regulations, not recommending, or discussing contracts, although it can assist with specific queries. However, they stress a clear and distinct responsibility allocation. Operators must maintain their oversight duty, even if they delegate some responsibilities. Any third party also must adhere to the same regulations and frameworks as the operator to conduct activities on the NCS.

5.5 Validation

The validation chapter aims to strengthen the assertions made regarding the perspectives on the Asset Partner model by incorporating insights from the operator companies, trade unions, and an oil service company. By analyzing the data obtained from these key stakeholders, this chapter provides additional evidence and support for the views expressed by each party involved in the O&G industry. The validation was conducted through multiple steps, including triangulation of data sources and expert review. These validation techniques enhance the trustworthiness and validity of the research findings.

To ensure the credibility of the research findings, multiple data sources were utilized. The perspectives and insights of the operator companies, trade unions, and oil service company were collected through interviews and analyzed collectively. This approach allowed for a comprehensive understanding of the Asset Partner model and its potential implications. The transcribed data collected underwent a verification process, where the participants were given the opportunity to review and validate the information. They had the chance to provide feedback to ensure the accuracy and validity of the collected data.

Triangulation of data sources helps to mitigate biases and limitations associated with individual data sources. By examining multiple perspectives and cross-referencing the findings, a more robust and reliable understanding of the research topic was achieved.

A professional review was conducted through the oil service company to validate the research findings and interpretations. The findings were shared with professionals who possess extensive knowledge and experience in the field of O&G operations.

The feedback received from the experts was carefully considered and integrated into the final analysis. This process added an additional layer of credibility and validity to the research findings.

The validation process employed in this study, including triangulation of data sources, and professional review, enhanced the reliability and credibility of the research findings. By utilizing multiple data sources, engaging participants, and seeking professionals' input, the study ensured a comprehensive and accurate understanding of the Asset Partner model and its implications. The collected data was shared with the participants for verification and comments. This step was taken to ensure the accuracy and alignment of the information with the notes taken from the interviews. By involving the participants in this verification process, the research aimed to uphold the integrity and reliability of the collected data.

The utilization of validation techniques in this study enhances the credibility of the research findings and contributes to the overall reliability of the study. The triangulation of data sources and professional review collectively support the validity and credibility of the research, enabling a more confident interpretation and conclusion of the study's findings.

The participants in this study, including industry professionals, trade union representatives, oil service company representatives and governmental authorities, bring extensive experience and knowledge to validate the research findings. With a total of 22 professionals from various operator companies and backgrounds, three from Trade unions and five representing the oil service company, their insights and perspectives contribute to the depth and reliability of the results. The participants' diverse expertise enhances the credibility of the study and ensures a well-rounded analysis of the Asset Partner model. Their valuable contributions strengthen the validity of the research findings.

6 Discussion

The discussion chapter examines the development of a successful Asset Partner business model in the O&G industry. Essential factors for success include clear business structure, service agreements, risk assessment, profit sharing, performance metrics, and regulatory compliance. The Asset Partner model must effectively manage capacity and operations to optimize production while minimizing costs. Key challenges involve personnel, contracts, safety, market fluctuations, and adherence to Norwegian law. By continually assessing and improving performance, the Asset Partner can provide high-quality services and maintain a competitive edge in the industry. The chapter builds upon the analysis conducted from the interviews and literature review.

6.1 Asset Partner

The term "Asset Partner" refers to a collaborative business model in the oil and gas industry where an operator company forms strategic partnerships with external service providers. In this model, the operator retains ownership of the assets while delegating certain responsibilities to specialized partners. The Asset Partner plays a significant role in delivering services such as maintenance, operations, and technical support, leveraging their expertise and resources to optimize asset performance. This partnership aims to combine strengths, drive competitiveness, and prioritize safety, compliance, and long-term sustainability.

From the operator's perspective, the Asset Partner model presents an opportunity to streamline operations and concentrate on their core competencies. Outsourcing specific functions to Asset Partners allows operators to focus more on strategic, revenue-generating activities, regulatory compliance, and risk management, while leaving day-to-day operations to the Asset Partners. However, even though operational responsibilities are delegated, operators are still required to maintain overall responsibility and oversight, ensuring all activities are compliant with regulations and safety protocols.

Trade unions see the potential of the Asset Partner model in terms of job creation and opportunities for workers to develop their skills and competencies. However, they also raise concerns about job security, wages, and the potential for operators to prioritize cost-cutting measures over health and safety. They stress the importance of a shared safety culture, rigorous training programs, and strong lines of communication to ensure that workers are adequately equipped and motivated to perform their duties safely and effectively.

From the oil service perspective, the Asset Partner model presents an opportunity to diversify and expand their business operations. Asset Partners are responsible for the efficient execution of day-to-day operations and management of resources, requiring them to maintain optimal levels of

staffing, equipment, and technical expertise. However, they also bear some risks, such as financial, HSE, and commercial risks. They must be prepared to manage these risks and market fluctuations, which require strategic planning, clear contractual agreements, and a good understanding of the market.

Government and Authorities, primarily represented by NPD and PSA, maintain the overarching role of ensuring compliance with regulations and safety protocols. They ensure that the operator, even when operations are delegated to Asset Partners, adheres to the Norwegian Petroleum Act. This aspect implies that while operations can be delegated, oversight and ultimate responsibility cannot be waived. The regulators maintain that they don't directly assess the relationship between operators and oil service companies but emphasize clear allocation of responsibilities and adherence to regulations and frameworks.

In the face of these diverse perspectives illustrated in Figure 23, it is crucial to consider how to best develop a successful Asset Partner business model. This model necessitates effective management of capacity and operations, optimization of production while minimizing costs, and strategic handling of key challenges. Operators and Asset Partners must find a balance between operational efficiency, risk management, profitability, and regulatory compliance. They need to engage in open and honest dialogue with trade unions to ensure that workers' rights and safety are prioritized. Moreover, they need to actively engage with government and regulatory authorities to ensure all operations meet the strict regulations of the Norwegian Petroleum Act.

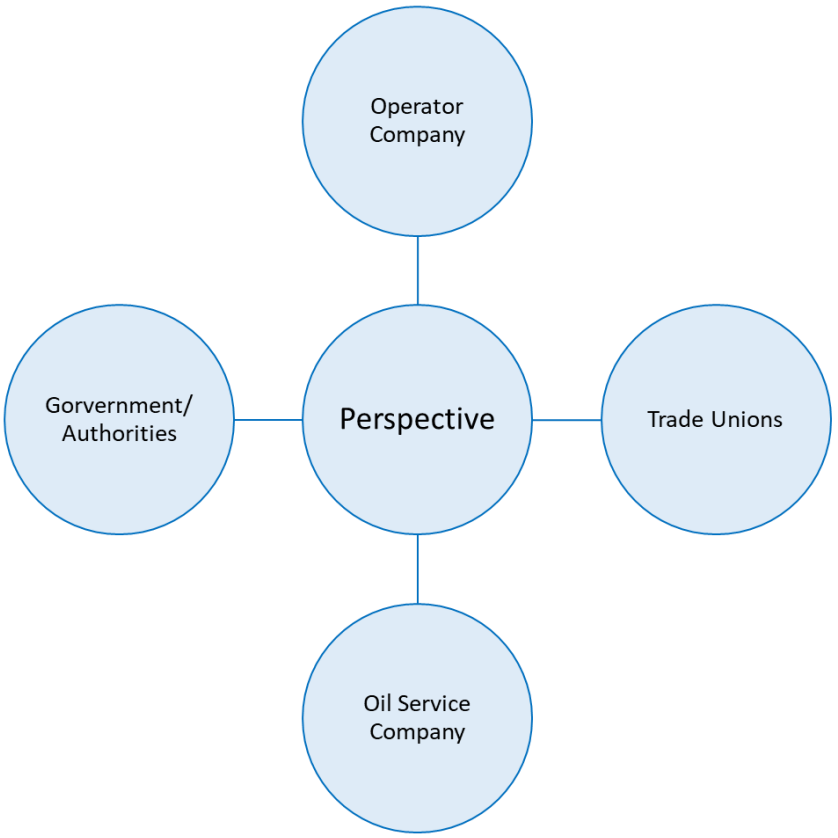

Figure 23: *Perspective of Operator company, Trade unions, Oil service Company, Government/Authorities.*

6.2 Opportunities and Challenges

The findings in the data collection gain an insight into the Asset Partner model. While this model presents significant advantages, it's not without its challenges. To ensure success, all parties must prioritize clear dialogue, robust collaboration, and an unwavering focus on safety, efficiency, and regulatory compliance. We'll examine the potential pitfalls alongside the benefits, such as high-quality service delivery, competitive advantage, and sustained growth in the industry. The continual evaluation and improvement of performance serves as the cornerstone for ensuring the Asset Partner model's optimal operation.

Opportunities:

- Efficiency and Focus on Core Competencies: The Asset Partner model offers operators the opportunity to focus on their strategic, revenue-generating activities and risk management by outsourcing specific functions. This potential for increased efficiency can be highly advantageous in an industry where even minor operational improvements can have significant financial implications.
- Expansion and Diversification: For oil service companies, the Asset Partner model provides an opportunity to diversify and expand their business operations. Being responsible for executing day-to-day operations means they can showcase their technical expertise and demonstrate their capacity to manage resources efficiently.
- Job Creation and Skills Development: Trade unions highlight the potential for job creation and opportunities for workers to broaden their skills and competencies, provided the right measures are put in place to maintain job security and adequate wages.
- Regulatory Compliance: The regulatory bodies emphasize the opportunity for better compliance with regulations and safety protocols, as the Asset Partner model clearly delineates roles and responsibilities.

Challenges:

- Maintaining Oversight and Responsibility: Even though operational tasks may be outsourced; operators are still required to maintain oversight and ultimate responsibility for operations. This challenge necessitates robust monitoring and control systems.
- Managing Risk: The Asset Partners bear considerable risks, such as financial, HSE, and commercial risks, which they need to manage strategically. They also need to navigate market fluctuations and adapt to changing conditions.
- Job Security and Safety: Trade unions express concerns about job security, fair wages, and the possibility of operators prioritizing cost-cutting over health and safety. Ensuring a shared safety culture and robust communication lines becomes paramount in this context.
- Adherence to Regulations: All operations must comply with the Norwegian Petroleum Act's strict regulations. The regulators do not directly assess the operator-Asset Partner relationship, adding another layer of complexity for the operators and Asset Partners to ensure compliance.

To leverage these opportunities and overcome the challenges, all stakeholders must demonstrate a commitment to communication, collaboration, and continual improvement. Developing an Asset Partner model that is successful and sustainable will require a comprehensive and nuanced approach that takes all these factors into consideration.

The challenges associated with risk may stem from both internal and external factors, thereby necessitating a thorough risk-sharing framework within the agreements. As revealed in the interviews, the risk must be equitably distributed between the partner and the operator.

While the operator would retain overall responsibility for risk management, they would be primarily tasked with handling external risks, which are typically beyond their immediate control. On the other hand, the Asset Partner is expected to shoulder more of the responsibility for internal risks, which are usually related to operational aspects that can be more effectively mitigated and controlled compared to external risks. Figure 24 is an illustration of the responsible of the risk in terms of external and internal risk.

Figure 24: *Risk sharing between Operator and Asset Partner.*

Internal Risks:

- Loss of Control: Delegating responsibilities to external partners may result in a loss of control over critical activities, impacting decision-making and operational efficiency. Clear communication and regular performance monitoring can help mitigate this risk.
- Erosion of Core Competencies: Relying heavily on external partners can weaken core competencies within the operator company over time. Assessing critical activities and retaining control over them can address this risk.
- Collaboration and Coordination Challenges: Differences in organizational cultures and communication gaps can hinder effective collaboration. Establishing strong communication channels and defined processes can overcome these challenges.

External Risks:

- Dependence on External Partners: Depending on external partners introduces the risk of performance and financial challenges. Thorough due diligence in partner selection can minimize dependence.
- Regulatory Compliance: Non-compliance with safety, health, and environmental regulations can result in legal and reputational consequences. Regular monitoring and collaboration with regulatory authorities are essential.
- Market Volatility and Competitive Landscape: Market fluctuations and evolving competition can impact profitability. Effective risk management and staying informed about market trends can mitigate these risks.

In the event of a crisis, an Asset Partner must take swift action to optimize its operations and reduce costs. This may involve implementing a leaner workforce, reducing production capacity, and optimizing its equipment to ensure maximum efficiency. If the Asset Partner doesn't take any action, the consequence is that the operator company terminates the contract to secure their own people first.

The Asset Partner model must also be prepared to offer alternative solutions to the operator company, such as utilizing their expertise in other areas of the energy sector or diversifying their service offerings to stay competitive and relevant for an operator company to still invest in an Asset Partner.

To ensure a collaborative approach in managing risks, the Asset Partner model should establish open lines of communication with the operator company, sharing information and insights about the market and proactively addressing any concerns or potential issues. Asset Partner should also work closely with regulatory authorities to ensure that they are complying with all relevant regulations and safety protocols.

Another risk is the oil price, which is a product that is affected by supply and demand, which are changing from day to day. This is a risk element that needs to be assessed in a contract agreement of a partnership model. The agreement should determine how to solve the fluctuations in the market, and to ensure that both parties are satisfied. The partner must analyze the potential risk factors that may impact the operations and develop contingency plans to mitigate their impact.

6.3 The change in Energy Landscape

According to recent reports, the demand for oil is predicted to continue to grow, but at a slower rate than in the past. The International Energy Agency (IEA) predicts that oil demand will continue to rise through 2026 as illustrated in Figure 25, but at a slower rate than in previous years. This is due to factors such as increased energy efficiency, policy initiatives to combat climate change, and the growing adoption of renewable energy sources. Yet, oil remains an essential energy source, particularly in developing economies. As the industry braces for these changes, the introduction of the Asset Partner model emerges as a potential strategy for maximizing production during the late-life stages of oil production [49].

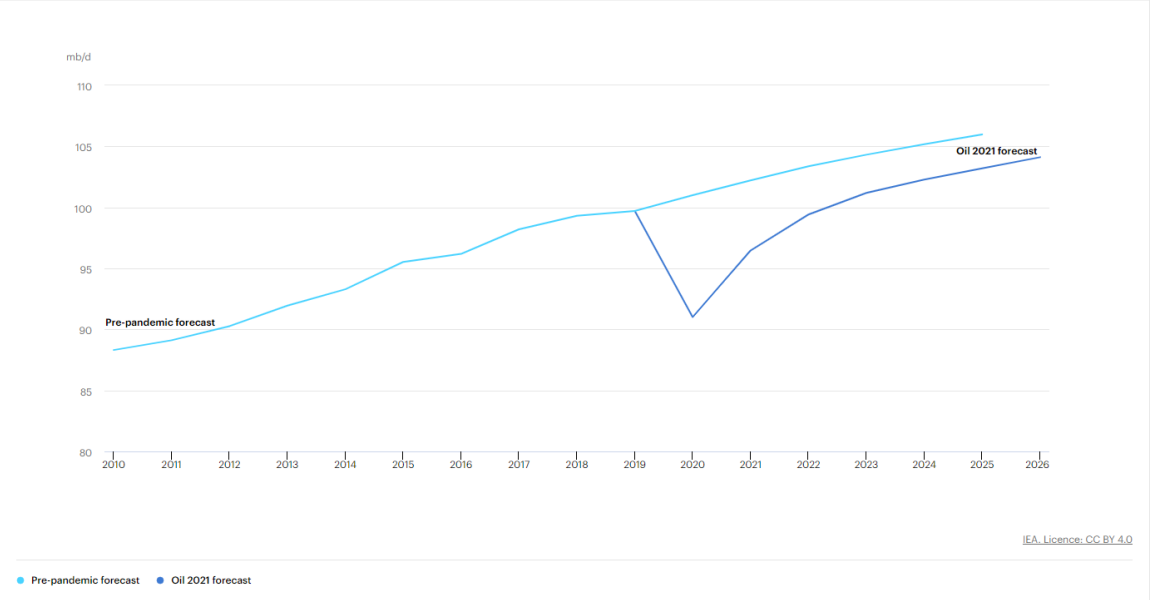

Figure 25: *Oil demand forecast, 2010-2026, pre-pandemic and in Oil 2021 [50].*

The Norwegian oil department has provided a graph illustrated in Figure 26 of the lifetime of some of the fields on NCS, where it shows the ceased production, which determines when the production stopped, the expected lifetime of the field and the extended lifetime of the field. The Asset Partner could contribute to extending the lifetime by maximizing the profit and the production, while the operator companies focus on other fields and assets. This will secure the jobs for the employees of the Asset Partner in many years into the future [51].

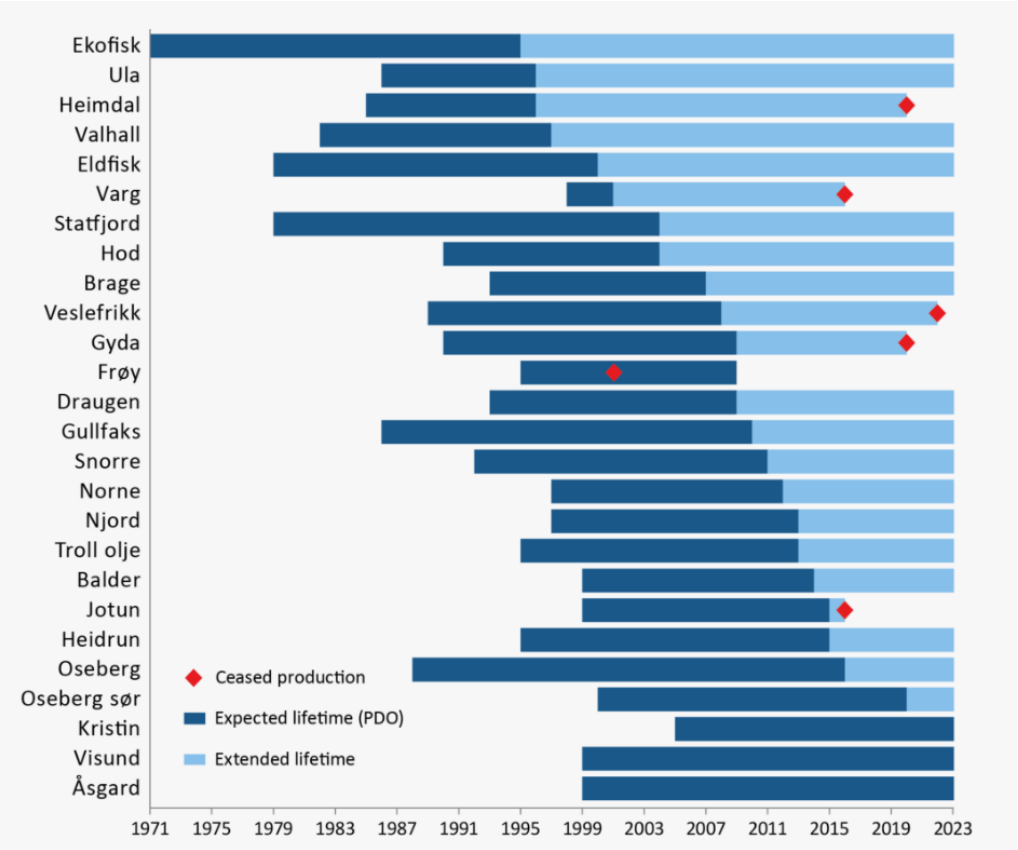

Figure 26: *Ceased production, expected lifetime, extended lifetime of Assets on NCS [51].*

In the O&G industry, there are distinct phases in the lifecycle of an asset, and each operator company has different thoughts about which stages this model could be an alternative to implement into. Figure 27 is an illustration of the different phases referred to in this study. The Asset Partner model provides a flexible framework that can be implemented in various stages, depending on the specific requirements and resources of the operator company.

Figure 27: *Operational Phases, Early-life, Operation, Late-life, Decommissioning.*

Throughout an asset's lifecycle, the Asset Partner model can serve as a crucial support system. During the early-life phase, operators may lack the resources or expertise for efficient production initiation and maintenance. Here, the model proves beneficial by ensuring stable operation, allowing the operator to focus on strategic operations, while benefiting from the Asset Partner's expertise.

As the asset transitions to the mid-phase, operators may choose to divert their resources elsewhere. Here, the model allows operators to delegate daily operations to a reliable service provider while they concentrate on other projects.

In the late-life phase, when resources are limited and costs need to be minimized, operators can assign operational responsibility to an Asset Partner. This approach provides continuity and helps manage workforce transitions post-asset's operation completion.

Moreover, small companies and startups, constrained by resources, can outsource daily operations to an Asset Partner, who helps run their assets effectively while they retain overall operational responsibility.

Interview findings validate the model's application in the O&G industry, with emphasis on cost reduction, resource optimization, and maximizing production during the late-life/end-life phase and decommissioning. Smaller E&P companies and specialized organizations lacking independent asset management resources are seen to gain the most from asset partnerships, especially in the decommissioning phase, where the model can optimize costs and ensuring a smooth transition from operation to cessation.

Furthermore, as global reliance on O&G decreases, the Asset Partner model could transition to other sectors, including renewables like wind and solar industries. Thus, the Asset Partner framework could serve as a viable business model in the future, leveraging the extensive experience garnered in the O&G industry.

6.3.1 Capacity- and Operation Management - Asset Partner model

As an oil service provider, the Asset Partner must manage its assets, equipment, workforce capacity, and operations to meet the production needs of the operator company while minimizing costs and maximizing profits. To achieve this, the Asset Partner needs to analyze current and future demand and identify any capacity constraints that may hinder its ability to meet production needs, such as equipment failure, maintenance, or weather conditions. It must develop plans for maintenance and repairs that optimize production capacity and may involve relocating the workforce or hiring more workers to the resource pool. Effective workforce management is crucial to ensure the right skills are available at the right time, which may involve providing additional training or hiring new workers.

In addition to managing capacity, the Asset Partner model should effectively manage the operations related to the production and operation of O&G fields. This involves planning, organizing, and supervising various aspects of the production process to ensure efficiency, quality, and safety. The Asset Partner must develop operational plans that consider equipment, personnel, and logistics to guarantee smooth production. Additionally, it must implement communication systems to keep all stakeholders informed, establish safety protocols, and comply with regulatory requirements.

As an oil service provider and Asset Partner, the company assumes full responsibility for its workforce. In relation to non-operational tasks, such as cleaning and cooking, the company may

have existing contracts with third-party entities to undertake these duties. However, for specific assets, the Asset Partner model would assume control of these contracts.

To optimize its production capacity and provide high-quality services to the operator company, the Asset Partner must continuously monitor and evaluate its operational performance. This involves tracking production volumes, costs, and quality metrics, analyzing data to detect trends and potential areas for improvement, and implementing necessary changes. Effective capacity- and operation management is critical for the Asset Partner to meet the operator company's needs and maintain a competitive advantage in the O&G industry. By planning, organizing, and supervising the production process, implementing effective communication and safety protocols, and continually assessing and improving performance, the Asset Partner model can optimize its operations and provide high-quality services to the operator company.

6.3.2 Organization

The successful management of a partnership between an operator company and an asset partner relies on a robust organizational structure that effectively covers the diverse range of expertise needed for the operation. Figure 28 is an organizational structure of the teams required for the operator Company, Asset Partner, and offshore support team. According to the operator and oil service company's input on desired in-house personnel from Data collection – Operator, a highly skilled team is crucial. This team should consist of technical experts for follow-up and maintenance, financial experts overseeing contracts and economics, legal professionals, production engineers, commercial resources, contract managers, and individuals in leadership or management positions. Additionally, cost controllers and finance professionals are essential to ensuring the partnership remains cost-efficient.

On the asset partner side, there are two main categories of personnel: those involved in daily operations and those supporting offshore activities. Daily operations personnel include operational personnel responsible for the day-to-day running of the production asset, maintenance personnel specialized in mechanical, electrical, and automation tasks, administration personnel offshore consisting of supervisors and technical leaders, and HESQ personnel overseeing HSEQ. These individuals must work together to maintain smooth, efficient, and compliant production processes.

In terms of offshore support, additional personnel are needed to ensure the well-being and safety of the workforce. This group includes cleaning personnel for maintaining facility cleanliness, cooking personnel in charge of meal planning and food preparation, medical personnel providing necessary health services, and pilot services to navigate vessels in the vicinity of the offshore asset. By establishing a well-defined organizational structure with specific roles and responsibilities, both the operator company and asset partner can effectively manage their partnership and ensure the successful operation of the O&G production asset.

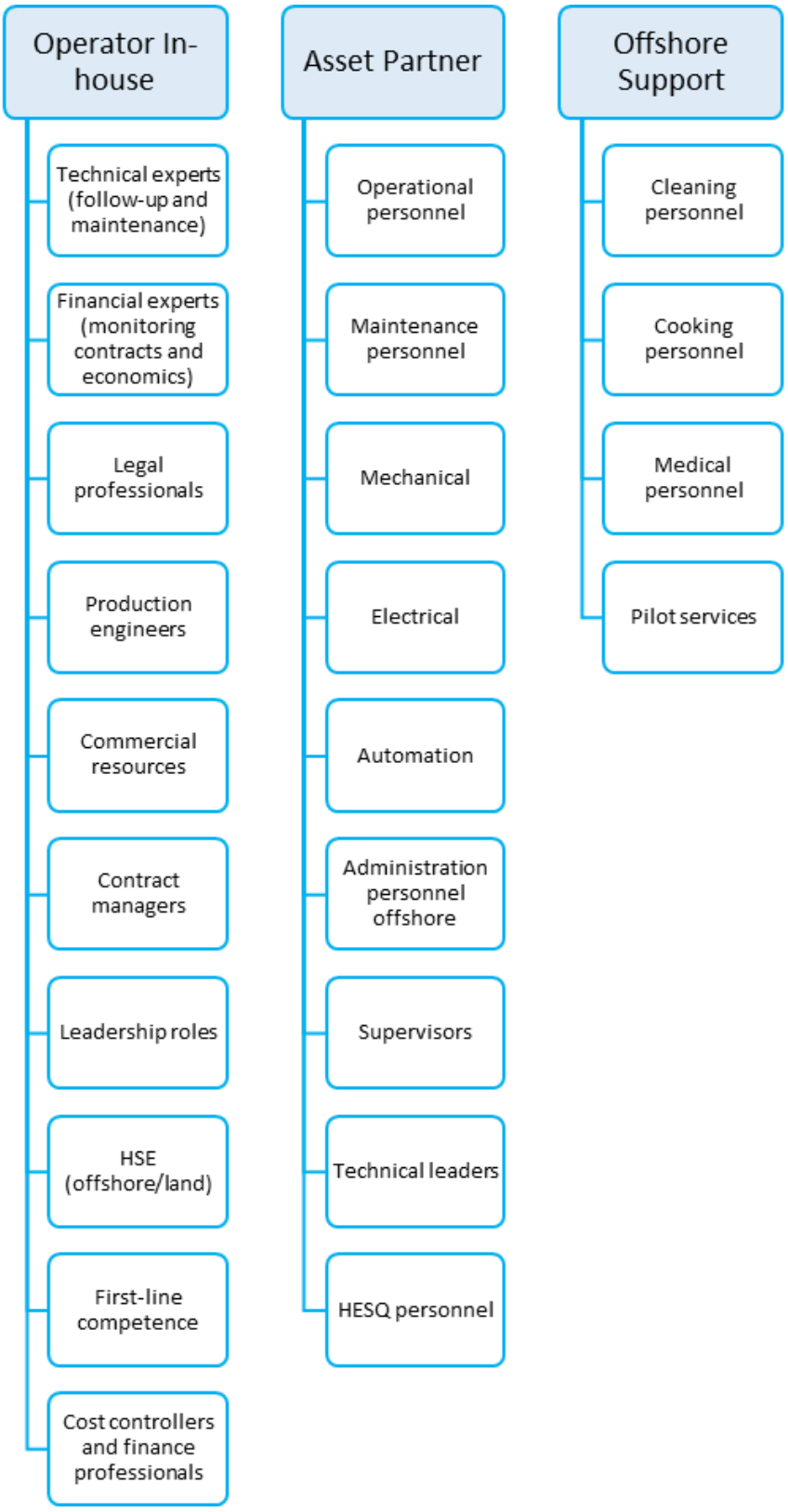

Figure 28: *Organization structure - Operator, Asset Partner, Offshore support.*

6.3.3 Challenges related to Personnel

One of the challenges related to personnel on NCS according to PSA, is lack of competence and training for temporary hired personnel. There is an increasing use of temporary hired personnel, which again creates a higher risk due to lack of competence and training, as well as communication challenges. framework conditions for suppliers within the petroleum business regarding employment conditions, employee participation, working environment and safety. The report includes the business areas drilling operations, drilling and well service, maintenance/modifications and insulation, scaffold, and surface protection [5].

An increase in the hiring of foreign workers through staffing agencies has led to communication challenges, as they may not be familiar with the Scandinavian or English language. They are not so familiar with the working environment and safety culture on the NCS, which can create some challenges. The report from PSA also shows that they are less familiar with the safety representative/delegates scheme, and that the social working environment is worse due to more frequent replacement of workers. The lack of competence and training can result in person injuries and major accidents, due to rule violations and wrong actions (decision errors, omissions, and oversights) [5].

Another challenge is the time pressure and low staffing that can occur with temporary hired personnel or suppliers who provide a service to the operator company. It depends on which contract agreements the supplier has with the operator companies, where time and material, as well as performance-based models, have most challenges related to HSE. These challenges were related to time pressure, as well as reduced terms of HSE. The findings were because the operator did not have the capacity to follow-up and facilitate thorough planning and execution of the work. Due to high activity on the asset, it required more personnel. This resulted in temporary workers with lower competency and training than expected. In the high activity period, it was also a lack in the training and follow-up of the workers with less experience due to capacity [5].

There is significant variation among companies in terms of reported temporary staffing rates. For the year 2019, three companies in the sample reported a temporary staffing rate of over 50%. Among the companies with the highest proportion of temporary staffing, the majority are suppliers of Insulation and Surface Treatment.
This shows a high demand for personnel, which in turn can lead to a reduced safety culture in relation to the issues mentioned earlier [5].

6.4 Future work

The research conducted on the Asset Partner model in the NCS, and the O&G industry has identified several areas that could be investigated and studied in the future. These areas could provide valuable insights and build upon the research conducted in this study.

- Future research could examine the influence of rapid technological advancements in the O&G industry on the Asset Partner model, particularly how they might enhance efficiency and reduce costs.
- The potential application of the Asset Partner model in industries like mining, renewable energy, and transportation is worth exploring.
- Studying how increased environmental regulations and sustainability efforts might impact the Asset Partner model in the O&G industry is another valuable research direction.
- Investigating the role of trust in the success of the Asset Partner model, including its establishment and maintenance, is also suggested.
- The potential effects of the Asset Partner model on workforce dynamics, including job loss and upskilling requirements, need to be studied.
- Finally, the model and contracts that ensure the long-term security of both parties in the partnership need development, including aspects such as risk sharing and financial considerations.

There are several areas that could be investigated and studied in the future to build upon the research conducted on the Asset Partner model in the NCS and the O&G industry. These areas include the impact of technology, the applicability of the model in other industries, the impact of environmental regulations, the role of trust, and the impact on the workforce. Further research in these areas could provide valuable insights into the Asset Partner model and its potential for increasing competitiveness in the market.

7 Conclusion

This chapter will provide a summary of the findings in this study. It will give a summary of the perspectives from the different actors on NCS, such as Operator company, trade unions and oil service companies. It will also answer the predefined research questions.

7.1 Findings

The term "Asset Partner" is as mentioned a not defined term, but it can be referred to a collaborative business model in the O&G industry, where an operator company forms a strategic partnership with external service providers to manage and maintain the operational assets. Under this model, the operator retains ownership of the assets while delegating certain responsibilities and activities to specialized partners.

The Asset Partner assumes a significant role in delivering services such as maintenance, operations, and technical support, leveraging their expertise and resources to operate and either maintain or optimize asset performance and operational efficiency. This partnership aims to combine the strengths of both parties and drive competitiveness in the industry while maintaining a focus on safety, compliance, and long-term sustainability.

This model allows operators to focus on their core competencies while leveraging the expertise and resources of service companies. It offers advantages such as increased efficiency, cost savings, and access to advanced technologies. However, challenges include the loss of control over critical activities and potential erosion of core competencies.

Trade unions play a crucial role in protecting workers' rights and interests in outsourcing situations. Their concerns include decreased job security and reduced worker involvement. They emphasize the importance of fair treatment, adequate working conditions, and communication between employers and employees.

Oil service companies see the Asset Partner model as an opportunity to offer specialized services and expertise. They prioritize high-quality services, meeting contractual obligations, and maintaining open communication with clients. Collaboration and ensuring workforce competence are essential for delivering value to their partners.

Government and authorities regulate petroleum activities through the Norwegian Petroleum Act. Operators must adhere to HSE regulations and maintain oversight of their assets, even when

outsourcing. The PSA oversees compliance but does not assess operator-service company relationships.

The green transition and technological advancements will impact the Asset Partner model. Outsourcing strategies and workforce requirements may change as the industry shifts towards greener energy sources. Advanced technologies, automation, and digitalization will transform outsourced activities. Regulatory adaptations will be necessary to ensure responsible practices, worker protection, and environmental standards.

In summary, the findings for this study highlight the complexities and considerations associated with the Asset Partner model. By addressing the perspectives of operator companies, trade unions, oil service companies, and government/authorities, a comprehensive understanding of the opportunities, challenges, and potential future implications of this model has been gained.

For the Operator companies this includes increased efficiency, cost savings, and access to specialized resources. However, it also presents challenges related to the loss of control and potential erosion of core competencies. Trade unions play a crucial role in protecting the rights and interests of workers and advocating for fair treatment in outsourcing situations. Oil service company contribute their expertise and specialized services to support the success of the model.

The green transition and technological advancements can also have an impact in the future of the Asset Partner model, necessitating regulatory adaptations to ensure its sustainability and alignment with environmental goals. By addressing the perspectives of the different roles involved, the findings of this study provide a comprehensive understanding of the Asset Partner model and its implications for the O&G industry. Further research and collaboration between stakeholders are needed to develop best practices, guidelines, and regulatory frameworks that support the successful implementation and operation of the Asset Partner model in the O&G industry.

7.2 Answer to the research questions

What are the benefits and challenges of implementing an "Asset Partner" model in the O&G industry, and how can it be used to increase competitiveness in the market?

The "Asset Partner" model in the O&G industry offers benefits such as increased operational efficiency, cost savings, and access to specialized resources. However, challenges include potential loss of control and the need for effective communication and clear contractual agreements. Building trust and strong relationships between partners are crucial for successful implementation.

How do regulations and authorities, such as the Petroleum Safety Authority, impact the implementation and success of the "Asset Partner" model in the O&G industry?

Regulations, such as those enforced by the Petroleum Safety Authority (PSA), play a crucial role in the implementation and success of the Asset Partner model in the O&G industry. The PSA oversees safety, health, and environmental practices and requires operators, including those using the Asset Partner model, to comply with these regulations. Operators retain responsibility and oversight even when activities are outsourced, placing accountability on them to ensure partners adhere to regulatory requirements. Operators must actively manage relationships, maintain compliance, and engage in regular communication and collaboration with partners and regulatory authorities for successful implementation.

How does the "Asset Partner" model compare to traditional contractor and partnership models such as Technical Service Provider (TSP) model.

The Asset Partner model differs from traditional contractors such as TSP models by involving a strategic partnership where the operator retains ownership of assets while delegating responsibilities to specialized partners. Compared to traditional models, the Asset Partner model enables deeper collaboration and integration, with partners engaged in a broader range of activities to optimize asset performance. Unlike transactional service provision, the Asset Partner model emphasizes a comprehensive partnership with shared responsibilities and a mutual interest in asset success.

What are the specific business models and strategies that can be used to effectively implement the "Asset Partner" model in the O&G industry?

To implement the Asset Partner model successfully in the O&G industry, specific business models and strategies are essential:

- Clear contractual agreements: Establish a solid legal framework defining roles, responsibilities, performance expectations, and financial arrangements. Include KPI, service level agreements, and mechanisms for dispute resolution.
- Open communication and collaboration: Foster effective communication and collaboration between the operator company and the partner through regular meetings, joint planning, and information sharing to align objectives and facilitate decision-making.
- Performance monitoring and evaluation: Implement robust mechanisms to monitor and evaluate the partner's performance, ensuring compliance with contractual obligations. Define and measure KPI to drive continuous improvement.
- Risk and relationship management: Proactively manage risks and cultivate strong working relationships based on trust, transparency, and mutual respect. Conduct thorough risk assessments, develop mitigation strategies, and maintain open lines of communication.
- Competence development and knowledge transfer: Support the partner's capabilities by providing training, knowledge transfer, and ongoing support to optimize asset performance. Focus on enhancing skills, expertise, and resources.

References

[1] C. Handscomb, S. Sharabura and J. Woxholth, "The oil and gas organization of the future," McKinsey, 28 09 2016. [Online]. Available: https://www.mckinsey.com/industries/oil-and-gas/our-insights/the-oil-and-gas-organization-of-the-future. [Accessed 27 03 2023].

[2] C. Tapolcai and J. Pearce, "Strategic alliances: a win–win for oil and gas operators and suppliers," KEARNEY, 17 08 2022. [Online]. Available: https://www.kearney.com/industry/energy/article/-/insights/strategic-alliances-a-win-win-for-oil-and-gas-operators-and-suppliers. [Accessed 08 05 2023].

[3] Norwegian Petroleum, "THE SERVICE AND SUPPLY INDUSTRY," Norwegian Petroleum, 17 03 2022. [Online]. Available: https://www.norskpetroleum.no/en/developments-and-operations/service-and-supply-industry/. [Accessed 25 01 2023].

[4] Norwegian Petroleum, "DIVERSITY AND COMPETITION," Norwegian Petroleum, 14 03 2023. [Online]. Available: https://www.norskpetroleum.no/en/developments-and-operations/number-and-diversity-of-companies/. [Accessed 25 03 2023].

[5] R. J. Bye, J. E. Vinnem, L. I. Sørskår, C. A. Grønlund, M. Pytte, G. Gjøsund and M. I. Standal, "Endrede rammebetingelser og konsekvenser for arbeidsmiljø og sikkerhet i petroleumsvirksomheten," Petroleumstilsynet, 2023.

[6] NOU - Norges offentlige utredninger, "Den norske modellen og fremtidens arbeidsliv - Utredning om tilknytningsformer og virksomhetsorganisering," Departementenes sikkerhets- og serviceorganisasjon Teknisk redaksjon, Oslo, 2021.

[7] H. Ritchie, M. Roser and P. Rosado, "Energy mix," OurWorldInData.org, 2022. [Online]. Available: https://ourworldindata.org/energy-mix. [Accessed 16 03 2023].

[8] S. Kvale, InterViews - An Introduction to Qualitative Research Interviewing, California: SAGE Publications, Inc., 1996.

[9] J. Dudovskiy, "Interpretivism (interpretivist) Research Philosophy," Business Reaserch Methodolgy, [Online]. Available: https://research-methodology.net/research-philosophy/interpretivism/. [Accessed 12 05 2023].

[10] H. Noble and R. Heale, "Triangulation in research, with examples," BMJ Journals, 07 2019. [Online]. Available: https://ebn.bmj.com/content/22/3/67. [Accessed 13 05 2023].

[11] K. Fangen, "Kvalitativ metode," De nasjonale forskningsetiske komiteene, 06 09 2022. [Online]. Available: https://www.forskningsetikk.no/ressurser/fbib/metoder/kvalitativ-metode/. [Accessed 25 03 2023].

[12] Moreld Apply, "What we do," Moreld Apply, [Online]. Available: https://www.apply.no/what-we-do. [Accessed 25 01 2023].

[13] Moreld Apply, "About us," Moreld Apply, [Online]. Available: https://moreld.com/about-moreld/. [Accessed 25 01 2023].

[14] John Wood Group plc, "Our business," John Wood Group plc, [Online]. Available: https://www.woodplc.com/company/our-business. [Accessed 27 04 2023].

[15] Petrofac Limited, "Who we are," Petrofac Limited, [Online]. Available: https://www.petrofac.com/who-we-are/. [Accessed 27 04 2023].

[16] Gassco AS, "Anskaffelse av varer og tjenester for Gasscos operatørskap og virksomhetsområde utføres i hovedsak av Gassco direkte eller av våre «Technical Services

Providers» (TSP).," Gassco AS, [Online]. Available: https://www.gassco.no/om-gassco/anskaffelser/. [Accessed 10 05 2023].

[17] John Wood Group plc, "Expertise Operations," John Wood Group plc, [Online]. Available: https://www.woodplc.com/solutions/expertise/a-z-list-of-our-expertise/operations. [Accessed 28 04 2023].

[18] Petrofac Limited, "Operations services that drive value," Petrofac Limited, [Online]. Available: https://www.petrofac.com/services/asset-support/operations-services/. [Accessed 28 04 2023].

[19] T. v. d. Lei, P. Herder and Y. Wijnia, Asset Management - The State of the Art in Europe from a Life Cycle Perspective, Springer Science+Business Media B.V. 2012, 2012.

[20] International Standard (ISO), "ISO 55000 - Asset Management - Overview, principles and terminology," International Standard (ISO), Switzerland, 2014.

[21] A. Hayes, "Operations Management: Understanding and Using It," Investopedia, 18 01 2023. [Online]. Available: https://www.investopedia.com/terms/o/operations-management.asp. [Accessed 28 02 2023].

[22] A. Bloomenthal, "Capacity Management: Definition in Business and Strategies," Investopedia, 30 12 2020. [Online]. Available: https://www.investopedia.com/terms/c/capacity-management.asp. [Accessed 28 02 2023].

[23] Lean Enterprice Institute, "Operations," Lean Enterprise Institute, [Online]. Available: https://www.lean.org/explore-lean/operations/. [Accessed 15 03 2023].

[24] Toyota forklift, "What is Toyota Lean Management?," Toyota forklift, 01 04 2023. [Online]. Available: https://www.toyotaforklift.com/resource-library/blog/toyota-solutions/what-is-toyota-lean-management. [Accessed 04 03 2023].

[25] A. Barone, "What Is Total Quality Management (TQM), and Why Is It Important?," Investopedia, 28 03 2023. [Online]. Available: https://www.investopedia.com/terms/t/total-quality-management-tqm.asp. [Accessed 03 04 2023].

[26] Lean Enterprise Institute, "Plan, Do, Check, Act (PDCA)," Lean Enterprise Institute, [Online]. Available: https://www.lean.org/lexicon-terms/pdca/. [Accessed 05 22 2023].

[27] ProductPlan, "PDCA Cycle," ProductPlan, [Online]. Available: https://www.productplan.com/glossary/pdca-cycle/. [Accessed 26 04 2023].

[28] M. Smith-Solbakken, "Norsk Oljehistorie," Store Norske Leksikon, 26 01 2023. [Online]. Available: https://snl.no/Norsk_oljehistorie. [Accessed 10 02 2023].

[29] PETROLEUM SAFETY AUTHORITY NORWAY, "Tripartite Cooperation," PETROLEUM SAFETY AUTHORITY NORWAY, 11 03 2019. [Online]. Available: https://www.ptil.no/en/tripartite-cooperation/responsibility/requirements-for-operators-and-licensees/. [Accessed 31 01 2023].

[30] Lovdata, "Lov om petroleumsvirksomhet [petroleumsloven]," Olje- og energidepartementet, 29 11 1996. [Online]. Available: https://lovdata.no/dokument/NL/lov/1996-11-29-72. [Accessed 09 02 2023].

[31] Norwegian Petroleum, "THE SERVICE AND SUPPLY INDUSTRY," Norwegian Petroleum, 17 03 2022. [Online]. Available: https://www.norskpetroleum.no/en/developments-and-operations/service-and-supply-industry/. [Accessed 25 01 2023].

[32] PETROLEUM SAFETY AUTHORITY NORWAY, "Terms and expressions," PETROLEUM SAFETY AUTHORITY NORWAY, [Online]. Available: https://www.ptil.no/en/technical-competence/terms-and-expressions/. [Accessed 26 01 2023].

[33] IADC, "Duty Holder," IADC, [Online]. Available: https://iadclexicon.org/duty-holder/. [Accessed 23 03 2023].

[34] A. Twin, "Outsourcing: How It Works in Business, With Examples," Investopedia, 18 06 2022. [Online]. Available: https://www.investopedia.com/terms/o/outsourcing.asp. [Accessed 04 05 2023].

[35] YS, "YS jobber med," YS, [Online]. Available: https://ys.no/ys-jobber-med/. [Accessed 26 01 2023].

[36] Industri Energi, "Vedtekter for Industri Energi," Industri Energi, 26 11 2021. [Online]. Available: https://industrienergi.no/hvem-vi-er/vedtekter-for-industri-energi/. [Accessed 26 01 2023].

[37] Arbeidstilsynet, "Verneombud," Arbeidstilsynet, [Online]. Available: https://www.arbeidstilsynet.no/hms/roller-i-hms-arbeidet/verneombud/. [Accessed 26 01 2023].

[38] Norwegian Petroleum Directorate, "About us," Norwegian Petroleum Directorate, 28 04 2023. [Online]. Available: https://www.npd.no/en/about-us/. [Accessed 11 05 2023].

[39] Petroleum Safety Authority Norway, "About us," Petroleum Safety Authority Norway, 01 03 2019. [Online]. Available: https://www.ptil.no/en/about-us/role-and-area-of-responsibility/. [Accessed 11 05 2023].

[40] Brunel, "What do offshore workers do? And how much do they make?," Brunel, 01 10 2020. [Online]. Available: https://www.brunel.net/en/blog/oil-and-gas/offshore-workers. [Accessed 14 03 2023].

[41] T. Landa, "Norwegian Continental Shelf – a new dawn for EPC alliance contracts?," Lexology, 09 10 2017. [Online]. Available: https://www.lexology.com/commentary/energy-natural-resources/norway/simonsen-vogt-wiig-advokatfirma/norwegian-continental-shelf-a-new-dawn-for-epc-alliance-contracts. [Accessed 02 03 2023].

[42] V. Milch and K. Laumann, "The influence of interorganizational factors on offshore incidents in the Norwegian petroleum industry: Challenges and future directions," Department of Psychology, Norwegian University of Science and Technology, Trondheim, Norway, 2018.

[43] Regjeringen, "Lønnsdannelsen i lys av nye økonomiske utviklingstrekk," Finansdepartementet, 11 03 2016. [Online]. Available: https://www.regjeringen.no/no/dokumenter/nou-2016-15/id2511747/?ch=5. [Accessed 31 03 2023].

[44] E. Johansen, "How sensitive is the Norwegian stock market to oil-price volatility?," DNB - Asset Management, 06 05 2020. [Online]. Available: https://dnbam.com/se/finance-blog/how-sensitive-is-the-norwegian-stock-market-to-oil-price-volatility. [Accessed 31 03 2023].

[45] M. Johnston, "What Happened to Oil Prices in 2020," Investopedia, 22 02 2022. [Online]. Available: https://www.investopedia.com/articles/investing/100615/will-oil-prices-go-2017.asp. [Accessed 14 03 2023].

[46] Macrotrends, "Brent Crude Oil Prices - 10 Year Daily Chart," Macrotrends, 14 03 2023. [Online]. Available: https://www.macrotrends.net/2480/brent-crude-oil-prices-10-year-daily-chart. [Accessed 14 03 2023].

[47] Forente Nasjoner, "Arbeidsliv," Forente Nasjoner, 05 12 2022. [Online]. Available: https://www.fn.no/tema/arbeidsliv/arbeidsliv. [Accessed 08 04 2023].

[48] Norwegian Petroleum, "Companies," Norwegian Petroleum, 12 2022. [Online]. Available: https://www.norskpetroleum.no/en/facts/companies-production-licence/. [Accessed 08 04 2023].

[49] S&P Global Commodity Insights, "Global fossil fuel demand set for 2025 peak under net-zero pledges: IEA," S&P Global Commodity Insights, 13 10 2021. [Online]. Available: https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/oil/101321-global-fossil-fuel-demand-set-for-2025-peak-under-net-zero-pledges-iea. [Accessed 17 03 2023].

[50] IEA, "Oil demand forecast, 2010-2026, pre-pandemic and in Oil 2021," IEA, 26 10 2022. [Online]. Available: https://www.iea.org/data-and-statistics/charts/oil-demand-forecast-2010-2026-pre-pandemic-and-in-oil-2021. [Accessed 14 03 2023].

[51] Norwegian Petroleum, "CESSATION AND DECOMMISSIONING," Norwegian Petroleum, 09 01 2023. [Online]. Available: https://www.norskpetroleum.no/en/developments-and-operations/cessation-and-decommissioning/. [Accessed 17 03 2023].

Appendices

Appendix 1: *Data collection Operator Companies – Interview guide and answers*

1. What circumstances need to be in place for you to outsource operations and maintenance to a third-party company?

Outsourcing operations and maintenance to a third-party company can offer many benefits for oil and gas companies, including cost savings, increased efficiency, and access to specialized expertise. However, for this partnership to be successful, several circumstances need to be put in place.

Firstly, the regulatory framework must support and allow such partnerships. This involves compliance with legal requirements, safety standards, and environmental regulations. In Norway, the regulatory framework makes it difficult to implement such partnerships, and the willingness to adopt this model may vary depending on the size, complexity and structure of the operator company.

The partnership must be financially beneficial for the operator. This means that the operator must conduct a cost-benefit analysis to determine whether outsourcing is the best option. If outsourcing is the most cost-effective solution, partnership may be pursued.

Third-party companies should have a proven track record and capabilities in similar outsourcing activities. The operator must conduct thorough due diligence and assess the third-party company's financial stability, reputation, experience, and expertise in the relevant fields.

The operator must maintain control and oversight to ensure compliance with legal requirements, safety standards, and the company's operational objectives. This is essential to prevent outsourcing from compromising the safety, economy, or reputation of the operator. The outsourcing agreement should clearly define the roles, responsibilities, and performance requirements for both parties. The risks and responsibilities between the operator and the third-party company should be clearly defined and regulated in the contract. The agreement should contain provisions on risk distribution, insurance cover, liability, and compensation.

The business model must benefit both parties and promote collaboration. The operator and the third-party company should establish clear communication channels, performance metrics, and dispute resolution mechanisms. The partnership must be built on trust, mutual respect, and shared values. The third-party company must also ensure to have the necessary qualifications, expertise, and resources to perform the required tasks. The operator should assess the third-party company's technical, operational, and financial capabilities and ensure that they meet the required standards.

2. What expectations do you have for a third-party company regarding: Risk sharing, Cost optimization, Production optimization/loss, Operation efficiency/CO2 footprint and Incidents.

When engaging a third-party company in the oil and gas industry, there are several expectations that should be considered in the areas of risk sharing, cost optimization, production optimization and loss, operational efficiency and CO2 footprint, and incidents management.

Risk Sharing: It is essential to establish a clear framework for risk management between the operator and the third-party company. Both parties should collaborate to identify potential risks and develop strategies to minimize their impact. The responsibility for handling risks should be clearly defined in the contract, ensuring that both parties are committed to addressing these issues.

Cost Optimization: The third-party company should strive to deliver cost-effective solutions while maintaining high-quality standards. This can be achieved through innovative approaches and by adopting best practices from the industry. Incentive schemes can be put in place to motivate the third-party company to seek cost reductions without compromising the quality of their services.

Production Optimization and Loss: The third-party company should focus on optimizing production and minimizing losses. This includes ensuring the proper functioning of equipment, implementing effective maintenance strategies, and applying advanced technologies to improve operational efficiency. Both parties should collaborate to identify and address production bottlenecks and other challenges that could impact overall performance.

Operational Efficiency and CO2 Footprint: The third-party company should adopt environmentally friendly practices and work towards reducing their carbon footprint. This includes implementing energy-efficient technologies, reducing waste, and complying with the operator's emission standards, which are often stricter than those required by regulatory authorities. The contract should include incentives for the third-party company to achieve or exceed these standards, as well as penalties for non-compliance.

Incidents Management: The third-party company should prioritize safety and take responsibility for managing health, environment, and safety (HSE) issues within their operations. The operator will still be responsible for regulatory compliance, but the third-party company must have a plan in place for addressing incidents and learning from past events. This includes regular audits, incident reporting, and continuous improvement of safety procedures and protocols.

In summary, operators expect third-party companies to collaborate effectively in managing risks, optimizing costs and production, improving operational efficiency, reducing their CO2 footprint, and addressing incidents promptly and efficiently. Clear contracts and incentive structures, along with a strong safety culture and commitment to environmental performance, are essential

components in ensuring a successful partnership between operators and third-party companies in the oil and gas industry.

3. In which phase of Asset lifecycle do you foresee most relevant for Asset Partnership?

Based on the interviews, it appears that the late-life/end-life phase and decommissioning are the most relevant phases for asset partnership. In these phases, the focus is on cost reduction, maximizing production, and managing resources efficiently. Smaller E&P companies and specialized organizations are more likely to be involved in asset partnerships during these phases, as larger operators often have the resources to manage early-life and mid-phase assets themselves.

In the early life/start phase, operators typically have a high degree of collaboration with third-party companies, mainly as contractors or alliance partners. However, the competition for access to the right blocks is high, and the level of collaboration is minimal. During the production/mid-phase, operators often manage operations independently, although opportunities for third-party companies may exist in limited or highly specialized scopes.

During the late-life/end-life phase, operators focus on reducing costs and maximizing production. Asset partnerships have been successful in Europe, with smaller E&P companies taking over for major operators, as well as major operators dedicating separate, lean organizations to focus on this phase. Decommissioning, as part of the late-life phase, offers good opportunities for asset partnerships, especially when risks related to hydrocarbon extraction have been minimized. The decommissioning phase is increasingly driven by access to plants, rigs, and HLVs, providing an excellent opportunity to test asset partnership models.

Overall, asset partnerships are most relevant and feasible during the late-life and decommissioning phases of the asset lifecycle, with opportunities for collaboration in the early-life and mid-phase stages as well.

4. What kind of people do you need to be in-house to ensure a cost-efficient partnership with a potential Asset Partner?

To ensure a cost-efficient partnership with a potential Asset Partner, an organization needs to have a diverse and skilled in-house team that can effectively manage the partnership. This includes having personnel with sufficient expertise to oversee suppliers, manage projects, and handle responsibilities. The team should comprise of individuals with technical skills for follow-up and maintenance, financial experts for monitoring contracts and economics, and legal professionals to handle any potential issues. It is important to have representatives from both the operator company and the asset partner working together to maintain efficient communication and information flow.

Depending on the size and complexity of the field, the team might also require production engineers, commercial resources, and contract managers. In addition, all management, HSE (offshore/land), first-line competence, stable operations, and specialized knowledge. It is crucial to have experienced personnel to oversee operations, including an Asset Manager responsible for revenue streams, senior personnel in charge of maintenance and operations, and HSE management.

Having individuals with experience from both the partner and operator sides can help provide valuable insight and prevent tunnel vision. The team should be able to cover all necessary areas of expertise, such as contract management, specification of partner tasks, and follow-up on operations. The level of involvement and oversight required from the operator side may vary depending on the complexity and size of the field.

In addition, the in-house team should have the ability to maintain an overall view of the project, be up to date with technology and industry developments, and manage risks and stakeholder relations, including authorities and environmental organizations. Cost controllers and finance professionals are also essential to monitor deliveries and ensure accountability.

In summary, a cost-efficient partnership with an Asset Partner requires a diverse and skilled in-house team that can effectively manage various aspects of the partnership, ranging from technical and financial expertise to legal and project management skills.

5. How does your company prioritize the oil and gas compared to the transition towards sustainability?

The summary of the interviews indicates that companies in the oil and gas sector are at various stages of prioritizing the transition towards sustainability. Some companies have clear plans to reduce oil and gas production and invest their profits in green technologies, such as wind energy and carbon capture and storage (CCS). They are also evaluating government-led wind projects for potential involvement. Other companies are involved in producing gas as a cleaner energy source, focusing on CCS and energy efficiency.

However, some companies seem to have more talk than action, with no immediate plans for a green transition. They are primarily involved in electrifying their fields but do not see significant financial gains or losses from it. Some companies are balancing the need for a sustainable transition by ensuring the supply of oil and gas, aiming for net-zero emissions by 2050.

While some companies are focusing on optimizing their production process to reduce emissions, others prioritize oil and gas production and view themselves as primarily oil and gas companies. These companies are also investing in green technologies, such as solar and wind power, and are involved in research and development to improve sustainability. Some are also focusing on sharing data and digitalization to contribute to the green transition.

In summary, the oil and gas sector have a range of companies with different strategies and priorities when it comes to the transition towards sustainability. While some have clear plans for a greener future, others are more focused on optimizing their current operations, and some have not yet incorporated the green transition into their strategies.

6. How do you think your employees will be affected by this transition, and will your vision include relocating your employees from O&G to other sectors?

In summary, the transition from oil and gas to renewable energy sources is expected to affect employees in various ways. Many employees already possess skills and knowledge in areas such as drilling, reservoir management, and injection equipment, which are transferable to carbon capture and storage (CCS) and other green technologies. Some employees are expected to naturally move to renewable energy projects like Valemon and Hywind Tampen, while others may seek jobs in other sectors.

Younger employees are more enthusiastic about participating in the energy transition, but it is important to strike a balance between the older generation with experience in oil and gas and the new generation focused on green solutions. It is acknowledged that it can be challenging to be an expert in both fields, and recruitment might become difficult, especially for smaller companies. However, natural attrition and a reduction in oil and gas positions are expected to balance the workforce needs.

As the industry becomes more dynamic, companies will look for employees with the necessary skills for the tasks at hand. Renewable energy projects will require more engineers and designers, while fewer technicians and operators will be needed. Companies are also focusing on being adaptable, relocating employees within the organization and leveraging their oil and gas experience in renewable energy projects. The interest in green energy among younger employees is expected to drive a significant shift in the workforce towards renewable energy in the coming years.

7. What is your perspective of an Asset Partner model related to the green transition (Challenges/Opportunities)?

In summary, the Asset Partner model can present both opportunities and challenges in the context of the green transition. On one hand, it can be beneficial in cases where companies have specialized competence that can contribute to the green shift, allowing for operational efficiency and exchange of expertise. Asset Partners may also be more suitable for renewable industries, as the risks might be lower compared to oil and gas operations.

On the other hand, challenges arise due to the varied strategies of oil and gas companies regarding the transition, which can make partnerships difficult. Additionally, the green industry is not yet

profitable, making it difficult to structure agreements and impacting the financial viability of Asset Partners. There is also the concern that some Asset Partners may be too focused on maintaining and operating assets, rather than actively supporting the green shift.

The Asset Partner model could be more applicable in areas like late-life projects, wind farm operations, and CCS facilities, where automation and smaller operational units might reduce risks. However, the model's success will depend on the specific competencies and contributions that Asset Partners can offer within the green energy sector.

8. In light of potential market fluctuations such as those caused by oil prices and energy transition, how would you handle the partnership?

The interviewees suggested various strategies to manage partnerships in response to potential market fluctuations caused by oil prices and energy transition. They emphasized the need to maintain a sustainable operation regardless of oil prices, with Health, Safety, and Environment (HSE) being the top priority. The price assumptions for investments should be considered before entering a partnership. In addition, partnerships should focus on reducing costs and ensuring proper contracts are in place. Some operations may need to be downsized or closed, and the ability to downsize and upsize should be considered when choosing a partner.

The interviewees also recommended working on reducing operational costs and maintaining a robust base to withstand market fluctuations. Investing in profitable new projects, including renewable energy projects like wind farms and Carbon Capture and Storage (CCS) facilities, was also suggested. High-risk projects, particularly those involving CCS and underground operations, should be managed carefully. Risk-sharing culture and finding the right balance in contracts is important to ensure incentives are in place and adjustments can be made during tough times.

It is essential to have alliances that allow adaptation to high and low activity levels, with flexible staffing, to mitigate the impact of fluctuations. Promoting a long-term regional perspective is crucial, and fluctuations should not significantly affect this approach. Developing a commercial solution with asset partners that accounts for risk is also important. During fluctuations, partners should assist each other in finding solutions and efficiently dividing tasks. Lowering costs as a partner without compromising risk is a positive aspect of the partnership. Finally, contracts should provide some predictability to secure both parties and allow them to pursue other activities during market fluctuations.

9. Could you in the future look at the Asset Partner model to be an alternative to into your O&G portfolio?

In summary, the respondents shared mixed opinions on considering the Asset Partner-model as an alternative in their oil and gas (O&G) portfolio. Some respondents believe that it could be more relevant for smaller companies with leaner organizations and less complex assets, as it would

allow them to avoid staffing up for operations. However, larger companies may prefer maintaining control over safety, operations, and risk management.

Several respondents expressed concerns about the risks associated with the model, stating that it would only be viable if issues related to risk, reputation, regulatory and operational risks were adequately addressed. They also mentioned that the model should provide a clear win-win situation for all parties involved. Some respondents believe the Asset Partner-model could be applicable in the future, especially in late-life projects, decommissioning, or the renewable energy sector, if there is a concrete model in place and a positive response from the authorities.

On the other hand, some respondents do not see the Asset Partner-model as an attractive option, either because they do not see a significant difference from the existing alliance model, or because it would be challenging to find a win-win situation. There are also concerns about losing control and responsibility, as well as the need to retain sufficient internal competence within the operator company.

***Appendix 2**: Data collection Trade Unions – Interview guide and answers*

1. ***General views on outsourcing: What are your thoughts on outsourcing in general? Can you point out some of the main advantages and disadvantages for employees and employers? How do you assess risk in relation to gain in this context?***

From a trade union perspective, outsourcing is seen as a means of achieving economic efficiency by streamlining operations, but it comes with both advantages and disadvantages for workers and employers. One of the primary benefits of outsourcing is the potential cost savings for companies, allowing them to focus on their core business activities. However, the downside of outsourcing is the potential loss of loyalty and expertise among outsourced workers, who may not have the same commitment as directly employed staff. This can be attributed to the fact that these workers may not feel a strong sense of belonging or pride in the company. Additionally, the cost of labor can sometimes be higher than anticipated, undermining the anticipated economic benefits.

In certain areas of operation, such as painting, chemical handling, and climbing, outsourcing may provide access to specialized expertise that the operator company lacks. However, there are risks associated with outsourcing tasks involving high levels of risk, as they may require specific knowledge and safety protocols. Trade unions, such as the Fellesforbundet, play a crucial role in organizing and represent workers in these areas.

The trade union perspective recognizes the effectiveness of the Norwegian model, which emphasizes collaboration between the government, employers, and employees. This model has demonstrated positive results in terms of safety, productivity, and technological development. It is based on a functional regulatory framework that promotes innovation and technology adoption, leading to improvements in both safety and economic outcomes.

However, there are concerns about the impact of outsourcing on worker engagement and the reporting of risks. Outsourced workers may feel less inclined to raise concerns or report potential hazards due to fears of negative consequences for their own company. The threshold for reporting risks may be higher among outsourced workers compared to directly employed staff, resulting in potential gaps in communication and safety awareness.

In conclusion, while outsourcing can offer economic benefits for employers, it is important to consider the potential downsides and risks associated with it. Maintaining worker loyalty, expertise, and engagement is crucial for realizing the full benefits of outsourcing while ensuring safety and productivity. The Norwegian model provides a solid foundation for collaboration between stakeholders, but ongoing efforts are needed to address the challenges and ensure a balanced approach to outsourcing that protects the interests of both workers and employers.

2. ***Conditions for a successful partnership: When activities are outsourced, what do you think needs to be in place to ensure good cooperation between employee and employer?***

To ensure a successful partnership between workers and employers when activities are outsourced, several factors need to be in place. The level of loyalty among employees may vary depending on whether they work for the operator company or the outsourcing company. For example, in cases involving companies like Archer or Odfjell, employees' loyalty lies more with the outsourcing company they work for rather than the operator company.

Clear risk-sharing models and a defined responsibility framework are essential. The relationship between the workers (outsourced employees) and the employer (outsourcing company) needs to be established, considering factors such as reduced staffing and the need for cross-functional expertise. It is crucial to create a common understanding between workers and employers regarding job tasks. Given the high level of interdisciplinarity required in critical tasks, there can be tensions between workers and oil service companies due to different expectations. The primary obligation lies with the employer (outsourcing company) to ensure compliance with regulations and frameworks. It is possible to have a discipline leader from the outsourcing company who oversees the workers employed by the outsourcing company. Early engagement and shared arenas for both parties are crucial, as it is the duty of the employer to establish such forums.

Verification of compliance with laws and regulations is necessary. The main company must assess and ensure the status honestly, with a genuine desire to uncover and rectify any unfavorable conditions. Are there adequate union representatives and safety delegates among the outsourced workers, and do they have the necessary support to fulfill their roles effectively? Are they included and involved in the work environment committee and general safety work? Are working time arrangements in line with regulations? Are they being remunerated according to the requirements and agreements? From the trade union's perspective, it is observed that main companies often neglect their supervisory responsibilities, allowing clear violations of both legal and contractual requirements to reduce their own costs.

Currently, it is observed that the "safety delegates" of subcontractors have insulation and surface treatment (ISO) personnel who are responsible for scaffolding and insulation. Adapting to comply with the Work Environment Act is challenging in practice. It is difficult for a subcontractor's safety delegate to speak up, and here, the operator companies must adhere to and be open to receiving feedback without negatively impacting the outsourcing partner. The operator companies must genuinely desire to comply with Norwegian laws and regulations. It requires more time and effort to circumvent the law than to meet the requirements.

Openness and transparency are essential for a good partnership. Workers should be able to show and communicate when things are not working as expected, and they should be believed without negative consequences for the outsourcing company. An open dialogue with the management of the operator company can significantly contribute to the success of the partnership. It is crucial to

ensure that the employees of the outsourcing company are treated and supported just like the directly employed staff. There is a risk of outsourced employees being looked down upon compared to direct employees, and this perception needs to be addressed.

3. ***National vs. international outsourcing: How do you view outsourcing to companies in Norway compared to companies abroad? What do you think are the main differences and challenges?***

When it comes to outsourcing to companies in Norway compared to companies abroad, the most significant difference lies in the level of worker participation. International outsourcing models, such as those seen in the UKCS, Gulf of Mexico, Brazil, and the USA, lack worker involvement, which is a stark contrast to the Norwegian context. In Norway, the labor market is built on trust between workers and employers. Furthermore, the oil and gas industry hold high societal status in Norway, whereas in the UK and USA, it is seen as a low-status sector. This poses challenges in terms of the social contract, trade unions, and the collaboration between regulatory bodies like the NPD and PSA over time.

Another crucial difference is the stricter and more comprehensive regulatory framework in Norway. If these regulations are adhered to, it can improve working conditions. However, the norm today is a lack of compliance with regulations.
In some cases, changing leadership may be necessary, as many operator companies prioritize cost-saving measures. Conflicting key performance indicators (KPIs) and silo thinking can be problematic. It is possible to perform tasks that yield positive KPIs for oneself but negatively impact other departments, which is often considered acceptable. Some leaders are more focused on KPIs than overall operational optimization.

Cultural differences also play a role, as work dynamics in other countries may differ from the flat organizational culture in Norway. In Norway, there is an expectation that employees can communicate with their superiors without fear of repercussions. The presence of union representatives and safety delegates helps ensure this. However, for workers who are not directly employed, there can be uncertainty and a lack of openness. It is possible that the perception of successful outsourcing abroad may be skewed due to less transparency. From the trade union's perspective, it is difficult to see outsourcing working better abroad. The Norwegian offshore industry, with its high uptime and strong safety culture, stands as evidence to the contrary. Comparatively, the UK sector experiences lower uptime and higher instances of safety incidents. Overall, the Norwegian sector delivers better performance.

These differences and challenges emphasize the importance of maintaining worker participation, upholding regulations, and promoting a culture of trust and openness in outsourcing partnerships, regardless of whether they are national or international.

4. ***Outsourcing on the Norwegian Continental Shelf: What are your views on outsourcing in the context of the Norwegian Continental Shelf? Do you think this is a viable strategy for the future?***

From a trade union perspective, the current outsourcing models on the Norwegian continental shelf are generally considered acceptable for certain activities such as drilling, well services, and catering. However, there are concerns regarding the contractual models that shift more financial risk onto the winning bidders. If key performance indicators (KPIs) are not met, there is significant financial risk involved, especially in drilling and operations. The challenges arise from the contract duration of 4+4 and 5+5 years, which require constant renegotiation and potentially create uncertainty among the workforces. This situation puts employees' own jobs at stake. The expectation is for outsourcing to be cost-effective, employing newer technology, fewer personnel, and better organization, while continuously challenging the existing contract. There have been significant changes in recent years, and when employees age and companies downsize or lose contracts, there is uncertainty about their future. Often, when contracts are transferred, the company takes over the employees as well.

The current practice of outsourcing is not seen as viable in the long run. It leads to the erosion of national expertise, which is crucial for maintaining high-performance levels in the industry. Similar trends have been observed in the maritime and shipbuilding sectors, where valuable workers for the future were lost as these industries declined. In recent years, the competence in areas such as ISO, drilling, well services, and subcontractors has also been reduced.
Looking at the UK sector, which has achieved 60-70% operational efficiency due to their outsourcing and contracting models, it is seen as a benchmark for effective practices.

Overall, the trade union perspective is skeptical about the outsourcing strategy creating greater risks for the entire continental shelf. Industry cannot afford significant human or environmental accidents. If the weak link in the chain does not feel empowered to raise concerns, it creates a greater risk that can lead to accidents over time. Employees who have a sense of ownership and connection to their workplace tend to go the extra mile and take responsibility for their actions. This includes proper documentation for the benefit of future personnel. Without this sense of ownership, there is a concern that outsourced workers may not feel as committed or accountable. Having too many individuals without ownership over the production process can be worrisome, as it may lead to a lack of concern when issues arise and a potential loss of downtime due to a lack of ownership and engagement.

5. ***Outsourcing of operations and maintenance on the Norwegian Continental shelf: How do you view the idea of oil service companies taking over daily operations from operator companies on the shelf? What are the potential advantages and disadvantages of such a model?***

From a trade union perspective, the idea of oil service companies taking over the daily operations from operator companies on the continental shelf is strongly opposed. Industri Energi, the trade union, will use all available resources to counteract such a model. They highlight that companies like Maersk and Schlumberger attempted this on the YME field, but there is no reason for them to take over licenses or operatorship. The operator companies already possess the necessary competence, and there are no perceived advantages or reasons for the unions to support such a model. They view employment directly by the operator as a secure and predictable employment relationship. The negative perception stems from concerns about the management of economic resources, including the purchasing of services from affiliated companies. They also note that the trade union representation in these international companies is lacking, whereas the tripartite cooperation model in Norway functions very well.

In the current Norwegian context, the oil service companies are not adequately equipped for taking over daily operations. Therefore, the focus of concern shifts towards companies like Halliburton, Schlumberger, and Baker. The unions believe that collaboration is necessary, considering the extensive requirements from authorities, organizational aspects, and financial considerations.

One of the points raised is that a company providing services to an oil company spends a significant amount of time documenting the work performed. If the oil company performs the work itself, less reporting is required. Additionally, in-house employees often have a better understanding and expertise in carrying out the job, leading to less time spent on the actual work. The motivation for in-house employees is safe and efficient operations with minimal effort, while contract companies have an incentive to bill as many hours as possible.

The issue of ownership of the job is crucial, particularly for safety-critical equipment. The trade union emphasizes the importance of competence, whether employed directly by the operator or outsourced. They believe that workers should have the necessary competence regardless of their employment arrangement, including knowledge of the specific platform. It is acknowledged that all platforms are not identical, and there are challenges with transient teams that move from field to field.

In summary, the trade union perspective is skeptical of the outsourcing model, especially when it involves international companies and the potential loss of competence and control. They emphasize the importance of competence, safety culture, and open communication between the operator and contractor. There are concerns regarding the "blacklisted occupations" and the potential negative impact on job security and worker representation.

6. ***Regulatory changes: Are there any rules or regulations that you think authorities should change in today's outsourcing practices to reduce risk for both employees and employers?***

From a trade union perspective, there have been regulatory changes in recent years regarding outsourcing practices. European case law has played a role in ensuring equal treatment of companies. Industri Energi, the trade union, won a case in the Supreme Court two years ago regarding hiring in operator companies. While the regulations have fallen into place to some extent, the unions feel that there is a lack of follow-up from the authorities. The Petroleum Safety Authority Norway (PSA) owns the regulations for the continental shelf, which provide a strict framework while allowing for flexibility and placing significant responsibility on operator companies throughout the value chain. The trade unions desire that the Norwegian Oil and Gas Association (OGA) and PSA have the necessary resources to oversee these regulations.

With recent changes in the Norwegian Working Environment Act, the groundwork has been laid for developing a fair work environment. It is important to mention the "Petroleum Activities Act," particularly Section 1.2 on resource management. This section highlights that petroleum resources should be managed in a long-term perspective for the benefit of the entire Norwegian society, providing income, welfare, employment, environmental improvement, and support for Norwegian business and industrial development, while considering regional political interests and other activities.

According to the trade union perspective, the existing regulations are adequate, and the focus should be on compliance and enforcement. The authorities must facilitate PSA in carrying out its supervisory role. PSA issues orders to rectify non-compliance with the regulations. The authorities need to uphold their own oversight responsibilities and ensure that PSA fulfills its tasks and accepts PSA's findings. There is a need for effective enforcement of existing rules. The operator, regardless of outsourcing, remains responsible to the authorities.

In summary, the trade union perspective highlights the importance of compliance and enforcement of existing regulations. They call for the authorities to provide the necessary resources for PSA to carry out its oversight role effectively. While there may not be a need for many new regulations, it is crucial to enforce and uphold the existing ones. The trade unions emphasize that operators should maintain their accountability to the authorities, regardless of outsourcing arrangements.

7. ***The role of trade unions: What do trade unions do specifically to protect workers in outsourcing situations? Are there any specific measures taken in these situations compared to permanent positions directly within a company?***

From a trade union perspective, their role in protecting workers in outsourcing situations begins with the work done in advance, specifically regarding contractual matters. They emphasize the importance of assessing the need for outsourcing and believe that core functions and activities should be performed by the operator companies themselves. The trade unions strive to be involved in the process early on and look at the legal aspects to safeguard the rights of workers in such situations. They find the challenges lie more with types of hiring and enterprise arrangements

rather than outsourcing itself. Examples include outsourced accounting, laboratory services, administrative tasks, and logistics onshore. The involvement of union representatives at an early stage is crucial.

Concrete measures taken by trade unions include advocating for the fair treatment and adequate support of outsourced workers. They ensure that outsourced workers have the necessary framework conditions and a real opportunity to contribute to occupational health and safety work and joint working environment committees. Trade unions can also help raise issues on behalf of workers who may not be able to do so themselves due to the risk of dismissal. They actively engage with authorities to address concerns and protect workers' interests.

Trade unions act as watchdogs to protect the interests of their members and the tasks they perform. They foster solidarity and cooperation among members, often with union representatives leading the way in addressing issues with the contractor companies. From the trade union perspective, there is no inherent difference between directly employed and outsourced workers. However, if outsourced workers approach the trade unions, they may raise issues with the operator company on behalf of the outsourced workers through the union club structure. Trade unions follow up with each individual worker in terms of health and safety. They have dedicated full-time union representatives, including those responsible for health and safety, legal matters, and social issues, who advocate for all employees regardless of their employer. The trade unions work within the existing company structures and utilize the internal systems in the different companies where they have a significant presence.

8. ***Do you have any thoughts on how the green shift will affect workers going forward, especially in relation to outsourcing practices?***

According to the trade union perspective, the green transition is intertwined with outsourcing and runs parallel to the operation and development of the oil and gas industry. The green shift requires capital, investments, and resources, and the same companies that operate in the oil and gas sector are also involved in industries such as CCS (Carbon Capture and Storage), offshore wind, and hydrogen. Companies like Equinor, Aker BP, Vår Energi are actively involved in these industries and are creating new subsidiaries, such as Aker Horizon and Vår Grønn, to focus on green energy initiatives. For instance, Equinor is leading projects like Hywind Tampen.

There is a belief that outsourcing will not be the main approach for these companies in the future, as they are establishing new subsidiaries and investing in the emerging green industries. However, it is questioned whether companies like Equinor may divide themselves into separate entities in the future and whether this will be necessary. The green shift typically involves fewer employees compared to the operational phase of traditional industries like oil and gas. The green sectors may have lower profit margins, making the jobs less lucrative and potentially impacting safety regimes due to reduced resources.

Certain aspects of the green transition, such as the electrification of offshore platforms, can bring positive changes by reducing vibrations, emissions, and the risks associated with gas usage. However, there are trade-offs and challenges in terms of energy supply. It may be necessary to scale down onshore industries to support offshore operations, as there may not be enough power capacity to sustain both.

Regarding the impact on outsourcing, it is generally believed that companies will prioritize their own employees and seek opportunities to maximize their own profits. In some cases, outsourced workers may observe more environmentally friendly practices but may hesitate to speak up to protect their own job security and the development of the client company.

Overall, the perspective of trade unions is that the green transition will not significantly impact outsourcing. The focus for companies will be on where they can generate the most profit, while employees within their own organizations are concerned about the company's commitment to the green shift. Outsourced workers may recognize opportunities for more environmentally friendly practices but may be hesitant to speak up, allowing the client companies to drive the development of their own workplaces.

Appendix 3: *Data collection Oil Service Companies – Interview guide and answers*

1. ***What are the roles and responsibilities of an Asset Partner and the operator company in the partnership model?***

The operator company holds the overall responsibility, including regulatory compliance and overall management of the operations. The Asset Partner, on the other hand, focuses on the day-to-day operations and assumes specific functions defined by the operator. The key performance indicators (KPIs) and cost frameworks are typically outlined in the contract between the parties.

It was noted that the extent of responsibility given to the Asset Partner depends on the operator's preferences, project requirements, and the terms of the contractual agreements. In an offshore Asset Partner model, the operator typically retains responsibility for reservoir and production activities, as well as the sales of processed oil. The Asset Partner, on the other hand, takes charge of the daily production operations.

The concept of the Asset Partner model varies depending on the operator and their integration approach. The interviews revealed that the Asset Partner model can be seen as a form of outsourcing where the operator delegates specific functions to a third-party service provider. The level of responsibility, resources, and oversight allocated to the Asset Partner may vary based on the operator's preferences and the specific project requirements.

The interviews emphasized that the operator retains the ultimate responsibility and is accountable to regulatory authorities. However, there is flexibility in defining the responsibilities and roles between the operator and the Asset Partner. Technical authorities can be assigned to different disciplines within either the operator or the service provider, depending on the specific requirements of the project.

To be considered an enterprise, the Asset Partner must demonstrate independent management of personnel, possess dedicated equipment, and hold result-driven accountability. The Asset Partner's responsibilities may include operations, maintenance, and potentially decommissioning, depending on the agreed scope.

Overall, the interviews highlighted the importance of the operator's overarching responsibility and the Asset Partner's role as an executing partner. The Asset Partner's integration into license meetings was considered beneficial for effective collaboration and alignment with the operator's objectives. Additionally, having their own equipment, including clothing and tools, is crucial for the Asset Partner to be recognized as an enterprise.

These findings provide valuable insights into the roles and responsibilities of an Asset Partner and the operator company in the partnership model within the oil and gas industry. They contribute

to a better understanding of the practical implementation of the Asset Partner model and its implications for both parties involved.

2. How will an Asset Partner manage risk in the partnership model?

Based on the interviews conducted with the Oil Service Perspective on the management of risk in the partnership model, several key insights emerged. Firstly, it was emphasized that the ultimate responsibility for risk management lies with the operator company. While the Asset Partner sells its services and receives payments, the risk-sharing in the partnership model is more substantial. For instance, in the case of incidents or accidents occurring on an asset operated by the Asset Partner, both the operator and the Asset Partner may be held accountable by regulatory authorities. This raises interesting legal considerations, as investigations and enforcement actions often name both parties, but ultimately, the operator bears the primary responsibility.

Another significant aspect discussed was the different types of risks that an Asset Partner must manage. Financial risk and Health, Safety, and Environment (HSE) were identified as primary areas of concern. In terms of HSE, the Asset Partner operates within the framework set by the operator, assuming the responsibility to comply with safety standards and regulations. However, in the event of a major incident on an asset where the Asset Partner is responsible for operations, both the operator and the Asset Partner face critical implications. Despite this, the operator company is the one that would be held legally accountable.

From a financial perspective, risk management is closely tied to contractual agreements. Cost and profitability are key considerations, and the Asset Partner is expected to have a penalty or incentive structure in place to ensure their commitment to delivering quality services. This helps mitigate the risk of underperformance or inadequate service provision.

Commercial risk, particularly related to downtime and performance, falls largely on the shoulders of the service provider. To address this, it is crucial to establish fair compensation for the services rendered. Performance-based contracts can help align the incentives between the operator and the Asset Partner. Additionally, a penalty system should be in place to motivate the service provider to perform optimally and minimize commercial risk.

The level of risk in the partnership model depends on the division of responsibilities between the operator and the Asset Partner. The service provider assumes ownership of technical risks, while the operator company has the overall stakeholder responsibility. External risks, such as black swan events or other unexpected occurrences, are primarily the responsibility of the operator, while internal risks are more within the domain of the Asset Partner.

To effectively manage risk, regular risk management meetings are held between the operator and the Asset Partner. These meetings serve to identify, assess, and control risks associated with safety, production, market dynamics, resource allocation, competence, and environmental

considerations. By actively engaging in risk management, the Asset Partner aims to generate positive outcomes for all parties involved.

In conclusion, the interviews with the Oil Service Perspective shed light on the critical aspects of risk management in the partnership model. The operator retains ultimate responsibility, while the Asset Partner navigates financial, HSE, and commercial risks. Clear communication, performance-based contracts, and regular risk management meetings are key to ensuring effective risk management and successful collaboration in the partnership model.

3. ***How will an Asset Partner approach be developing a shared safety culture with the operator company in the partnership model?***

Based on the interviews conducted with the Oil Service Perspective on developing a shared safety culture with the operator company in the partnership model, several key insights emerged. Firstly, when entering a partnership, the Asset Partner must adopt the existing safety programs and procedures of the operator company. This includes sharing knowledge, adopting similar routines, and leveraging successful experiences in HSE. Notably, on the Norwegian Continental Shelf (NCS), there is a strong culture of openness and sharing among companies, particularly in the realm of HSE. Valuable experiences and lessons learned are shared through databases and simplified learning points, benefiting all parties involved. The development of a strong safety culture is seen as essential for the Norwegian offshore industry.

The approach to building a shared safety culture depends on factors such as the number of assets and whether the Asset Partner is involved with one or multiple assets. It requires developing an integrated HSE model where the responsibility is shared between the operator and the Asset Partner. The operator must entrust the operational readiness to the Asset Partner while remaining an integral part of it. This involves mobilizing an operator representative in the emergency preparedness committee and establishing a multi-tiered emergency response system that includes the Asset Partner.

When it comes to cultural integration, differences may arise when working with international clients compared to Norwegian assets. In the case of foreign contracts, cultural building becomes crucial, with the Asset Partner taking the responsibility of educating the owner on potential foreign assignments. However, when partnering with large Norwegian companies like Equinor, the Asset Partner needs to assimilate and integrate the existing safety culture already embedded within the operator's HSE model.

A shared focus on HSE is fostered through various means, such as integrated workshops, regular all-hands meetings, and underpinning the "One Team" philosophy, emphasizing the common goal and unity of purpose. Proactive measures, including annual HSE programs, preventive workshops, and campaigns, are essential to promote a safety-centric mindset. Additionally, follow-up and documentation of incidents are crucial, allowing for transparent insights for the operator and

conducting monthly meetings to address significant events. This approach ensures that both the operator and the Asset Partner are equally involved and committed to safety, eliminating any notion of an "A-team" or "B-team" dynamic.

In summary, developing a shared safety culture in the partnership model requires adopting existing safety programs, integrating HSE models, and promoting open communication and collaboration. By aligning their focus on HSE, conducting joint workshops and meetings, and fostering a sense of teamwork, the operator and Asset Partner can create a culture that prioritizes safety, preventive measures, incident management, and continuous learning.

4. ***How will an Asset Partner handle fluctuations in the market, such as those caused by a pandemic or changes in oil prices, in the partnership model?***

When considering how an Asset Partner would handle fluctuations in the market, such as those caused by a pandemic or changes in oil prices, insights from the interviews with the Oil Service Perspective shed light on several key points. Firstly, it is typically the operator company that bears most of the risk, depending on the contract's structure and its connection to oil prices. In times of crisis, there may be pressure from the client, but it can be challenging to incorporate such market fluctuations into a contract. However, normal market variations are expected, and both the operator and the Asset Partner have an interest in the client's profitability. In this regard, the Asset Partner would focus on the operational and maintenance aspects related to production and operations, while areas such as drilling, subsurface, and reservoir management would typically remain within the operator's core activities.

To effectively manage market fluctuations, it is crucial to establish a contract framework that ensures stability and benefits both parties. Compensation for base staffing and costs should remain unaffected by market swings. However, it is essential to avoid assuming responsibility for factors beyond one's control, such as reservoir performance. Asset Partners generally operate on lower-margin service models, making it challenging to assume significant commercial risks. Market fluctuations can impact Asset Partners more when they are not under contract and must secure new projects. However, if the service company offers a range of services beyond the partnership model, such as maintenance, modifications, and studies, it can help mitigate the effects of market fluctuations.

The commercial model adopted is of utmost importance. Effective resource management becomes critical, and the Asset Partner can reallocate personnel to other tasks if they have a diverse project portfolio compared to the operator. Sharing both upside and downside risks between the partner and the operator is seen as the most favorable model, as it motivates and energizes the workforce. Having a clear understanding that the partner's performance directly impacts the partnership's profitability fosters a sense of optimal performance. It is essential to set upper and lower boundaries within the contract to ensure adequate job performance. If operations do not go as planned and the partner is at fault, they will not receive any bonus or

profit and may incur losses. This ensures that hours and personnel are compensated and that the job does not result in a loss, but the upside potential remains. This allows for a viable partnership for both parties, where they share the upside while limiting the partner's downside exposure.

Fluctuations in the market are considered as part of the overall risk management strategy. They must be handled in a manner consistent with how operators currently address them. The primary focus is on ensuring operational stability, minimizing negative impacts, and making joint decisions on prioritization alongside owners and license partners, particularly in terms of OPEX and CAPEX expenditures. The Asset Partner aligns their priorities with the operator's, with a strong emphasis on operational aspects and a lesser focus on capital expenditure. This responsibility is integral to the Asset Partner's role. Regular discussions with the operator are necessary to manage risks effectively and ensure the continued operation of assets. Evaluations are made to determine the best and most profitable investments amid changing market conditions, and adjustments may need to be made in project schedules, efficiency initiatives, and evaluations to optimize investments.

Finding the right balance is crucial when considering capital expenditure during periods of low oil prices, as this affects the offerings and dynamics of the supplier industry. Communication, collaboration, and a joint focus on maintaining operations and efficiency are essential elements in navigating market fluctuations within the partnership model.

5. ***How will an Asset Partner ensure compliance with all relevant regulations and safety protocols in the partnership model?***

Ensuring compliance with regulations and safety protocols is a shared responsibility between the operator and the Asset Partner in the partnership model, as revealed in the interviews. The operator has the ultimate responsibility and duty to oversee those who carry out the operations. However, the Asset Partner must also possess a thorough understanding of the relevant regulations and stay updated on any changes. They need to develop and maintain their own emergency response plans, like those of the operator, as both parties can be held accountable in the event of an incident.

It is crucial for the Asset Partner to uphold their contractual obligations and have a comprehensive understanding of the applicable rules and regulations. This may involve having experienced personnel who can ensure compliance with the regulations set by PSA. Additionally, engaging external audits or reviews by reputable organizations like DNV (Det Norske Veritas) can provide an independent assessment of the operations' adherence to the regulatory framework and authorities. Another approach is to establish an open dialogue with PSA from the outset and maintain a humble and proactive approach to ensure compliance.

An optimal approach involves starting with internal assessments within the Asset Partner's organization, followed by collaboration with the operator. This collaboration includes discussions

on how responsibilities are divided, addressing areas such as emergency preparedness, and defining the boundaries of each party's accountability. The extent of the responsibilities entrusted to the Asset Partner will depend on the contractual model and the operator's willingness to delegate certain responsibilities. It is essential to have clear roles and responsibilities, ensuring that the operator retains the overall responsibility for delivering reports and maintaining communication with the authorities. Transparency between the operator and the Asset Partner is crucial in clarifying the respective roles and ensuring that both parties fulfill their obligations.

To ensure a cohesive compliance framework, the responsibilities should be appropriately split between the operator and the Asset Partner, so that the overall accountability is equivalent to what the operator would have if they had full control. While the Asset Partner cannot assume complete responsibility, they should take partial responsibility and maintain transparency with the operator. Defining the boundaries and establishing contractual agreements can be achieved through dedicated meetings. The operator remains responsible for overall compliance, while the Asset Partner focuses on delivering the results, they are accountable for. By establishing clear lines of responsibility, the partnership can effectively ensure compliance with regulations and safety protocols.

6. ***How will an Asset Partner ensure that workers receive adequate training and have the necessary competence to perform their jobs safely in the partnership model?***

Ensuring that workers receive adequate training and possess the necessary competence to perform their jobs safely is a crucial aspect in the partnership model, as highlighted in the interviews conducted. The responsibility for training and competence lies with both the operator and the Asset Partner, like any company operating on the Norwegian Continental Shelf (NCS). It is essential to ensure that all personnel possess the required competence, and that individuals without the necessary skills are not present on the worksite. Collaboration between companies is vital to achieve this objective, and corporate organizations can play a significant role in facilitating this process.

The Asset Partner must develop comprehensive training programs and ensure that employees receive the necessary training specific to the facility they will be working on, in addition to general training requirements. In some cases, when dealing with a new field or facility, the Asset Partner may need to undergo training like what the operator would have done previously. This strategy is usually established by the operator, and the Asset Partner must align their training approach accordingly.

Maintaining a mix of experienced and less-experienced personnel within a team is crucial. If possible, retaining some of the original employees from the facility who possess valuable knowledge and competence can be advantageous for the partnership. This is particularly relevant when service operators, such as well and drilling contractors or maintenance personnel, are transferred to the Asset Partner. However, it can be challenging to convince employees of the

operator company to transition to a service company. In such cases, the Asset Partner may need to offer attractive terms and incentives to ensure a smooth transition and retain valuable expertise.

To establish a robust competence framework, it is necessary to identify the relevant legal and regulatory requirements from authorities, as well as the specific requirements set by the operator and the Asset Partner. These elements should be consolidated into a comprehensive competence matrix, which is continuously monitored and followed up on. Training can be conducted internally by the Asset Partner, the operator, or external partners, forming a tripartite collaboration.

The operator will have specific requirements tailored to their operations, while the Asset Partner must establish their own supplier-specific requirements. These requirements need to be consolidated to achieve a shared goal for competence. By aligning training efforts, sharing best practices, and ensuring ongoing monitoring and follow-up, the partnership can ensure that workers receive adequate training and possess the necessary competence to perform their jobs safely.

7. ***How will an Asset Partner approach optimizing operations and equipment to ensure maximum efficiency in the partnership model?***

To ensure maximum efficiency in the partnership model, Asset Partners employ various strategies and approaches, as summarized from the interviews:

One key aspect is the use of Key Performance Indicators (KPIs) tied to the contract model. Regular performance meetings, such as daily or weekly sessions, are conducted to share information and track progress. These meetings enable effective communication and provide a platform for discussing and optimizing operations and equipment.

Collaboration and communication are emphasized to foster a culture of efficiency. The implementation of regular morning meetings involving all disciplines helps establish a shared understanding of operations and facilitates streamlined communication across the partnership. By aligning everyone's focus and improving information flow, these meetings contribute to enhancing efficiency.

It is important to strike a balance between providing oversight and avoiding micromanagement. Rather than delving into every detail during meetings, it is more effective to have separate discussions with the operator company's leaders. This approach enables explanations, justifications, and the exploration of alternative solutions, while ensuring decisions are made efficiently.

Efficient meeting management plays a crucial role, particularly when multiple participants are involved. A skilled meeting leader is essential for effectively managing the discussions, facilitating information flow, and ensuring that all relevant viewpoints are heard and considered.

Encouraging open discussion is also highlighted as a means of promoting efficiency. By creating an environment where all participants feel comfortable expressing their opinions and engaging in discussions, better decision-making and problem-solving can be achieved. This open dialogue allows for the exploration of different perspectives and innovative ideas, ultimately leading to improved efficiency.

To optimize operations and equipment, a shared understanding is paramount. Finding a model or approach that enables both the operator and the Asset Partner to develop a common understanding of goals, objectives, and strategies is crucial. This shared understanding provides a solid foundation for collaborative efforts aimed at achieving maximum efficiency.

Profitability for both partners is a central focus. Both the operator and the Asset Partner are driven by the goal of generating profits. Therefore, optimization efforts should be designed to benefit both parties, ensuring that the partnership remains mutually beneficial and financially sustainable.

Contractual considerations play a significant role in determining the approach to optimizing operations and equipment. The compensation model and contractual agreements between the operator and the Asset Partner need to align with the desired production levels, uptime, and maintenance strategies. By considering these factors, the partnership can achieve optimal efficiency and profitability.

Efficient maintenance practices are crucial. Asset Partners must strike a balance between preserving and maintaining the asset while minimizing unnecessary costs. The maintenance activities should align with the asset's expected lifespan, ensuring that safety standards are upheld without compromising efficiency.

Incentivizing efficiency is an effective approach. When the partner has a sense of ownership and clear incentives, they are more motivated to work smartly and efficiently. This includes exploring cost-saving opportunities and sharing the benefits of these initiatives with the operator, fostering collaboration and innovation.

Continuous improvement is a key principle. Following the Plan-Do-Check-Act (PDCA) cycle, Asset Partners plan, execute, monitor, and seek opportunities for improvement in operations and equipment efficiency. By embracing a culture of continuous improvement, the partnership can adapt to changing market conditions and sustain optimal efficiency.

The Asset Partner takes responsibility as a driving force for process improvement. They actively identify areas for enhancement, propose initiatives, and collaborate with the operator to

implement improvements. By assuming this proactive role, the Asset Partner contributes to the partnership's overall efficiency and success.

Establishing dedicated teams for continuous improvement initiatives is also recommended. These teams work together based on mutually agreed priorities between the operator and the Asset Partner. By focusing on shared goals and actively seeking ways to optimize operations and equipment, these teams contribute to sustained efficiency gains.
Documentation and planning for continuous improvement are essential. The Asset Partner should systematically document improvement initiatives and plan for ongoing process enhancements. This includes obtaining the operator's approval.

8. ***What are the expectations of an Asset Partner for sharing costs and profits with the operator company in the partnership model?***

In the partnership model, the expectations of an Asset Partner regarding cost and profit sharing with the operator company are summarized as follows:

The goal is to establish a win-win scenario where both parties benefit. To achieve this, a fair and transparent risk-sharing arrangement is necessary. This includes defining a base price, potentially linked to oil prices, and ensuring clear roles and a shared understanding. Trust is a key factor in finding collaborative solutions and working together effectively.

Long-term contracts provide stability and incentivize efficient operations. If the Asset Partner can propose solutions that lead to cost savings, they should be rewarded accordingly. It is important to strike a balance between OPEX and CAPEX. The operator company typically shares the CAPEX responsibility, while the Asset Partner bears more of the OPEX costs as per the contractual agreement.

An Asset Partner may be willing to take on significant risks if there is potential for substantial gains. However, it is crucial to maintain a reasonable level of downside risk. A successful partnership should not compromise health, safety, and quality standards. The Asset Partner's ability to bear financial risks is limited, and there should be a cost barrier to ensure satisfactory operations while avoiding excessive financial risk. A base payment structure should be established to safeguard against negative impacts on health, safety, and quality, with only profits at stake.

To ensure viability, there must be a balanced approach. The Asset Partner should be able to break even, while the operator company, as the asset owner, may face potential losses. It is essential to have a performance-based model, where the Asset Partner's compensation is tied to their performance. This incentivizes them to strive for excellence. Penalties can also be incorporated into the model to hold the partner accountable for underperformance. A well-balanced contract ensures profitability for both parties and minimizes the risk of bankruptcy for the Asset Partner.

Establishing KPIs for OPEX and CAPEX is crucial. The Asset Partner should maintain an open-book approach, providing transparency regarding OPEX and CAPEX costs with a fixed markup. Separate income budgets based on oil and gas prices can be agreed upon. Bonuses can be awarded if the Asset Partner successfully achieves OPEX and CAPEX efficiencies beyond the planned targets, typically following a 70/30 split in favor of the partner. Furthermore, the Asset Partner may receive a bonus if the income budget exceeds estimated revenues.

Transparency and open communication are essential. Sharing OPEX and CAPEX information with a clear profit margin ensures transparency between the parties. Bonuses can be awarded based on the successful execution of projects, promoting efficient operations, and providing an opportunity for the Asset Partner to share in the profits. The split can follow a 70/30 model, where the Asset Partner is compensated for exceeding expectations. Conversely, if the job falls short of expectations, the Asset Partner bears the associated costs.

In summary, the expectations of an Asset Partner for sharing costs and profits in the partnership model revolve around establishing a fair and transparent framework, incentivizing efficient operations, and striking a balance between risk and reward. By aligning financial incentives, implementing performance-based models, and maintaining open communication, both the operator company and the Asset Partner can work towards maximizing profitability and success in the partnership.

9. ***What are the advantages and disadvantages of a partnership such as this, for both the Asset Partner and the operator company?***

The advantages and disadvantages of a partnership between an Asset Partner and an operator company in the oil industry, as expressed in the interviews, can be summarized as follows:

Advantages:

- For the operator company, partnering with an Asset Partner allows them to focus on their core business and avoid the non-revenue-generating task of platform operations. It enables them to reduce manpower and organization costs and achieve greater flexibility. They can redirect their attention to financial factors and prioritize existing and new field developments.
- Partnering with an Asset Partner provides access to a broader range of experience from various projects. The Asset Partner can bring in expertise and lessons learned from other ventures, benefiting both parties.
- A partnership model offers predictability and the ability to adapt to changes in the industry. It allows for a more streamlined and cost-effective operation, especially for smaller or new fields. The operator company can avoid building a new organization and navigate regulatory requirements by outsourcing certain responsibilities to the Asset Partner.
- The Asset Partner can take on larger delivery aspects and expand their business opportunities by engaging in newer projects.

Disadvantages:

- One challenge is the complexity of entering into and changing partnership agreements. Compared to traditional contracts, the transition to an Asset Partner model may involve significant adjustments and coordination.
- There is a risk that the Asset Partner may lose talented personnel to the operator company. To retain skilled employees, the Asset Partner needs to offer competitive compensation and benefits. The ability to compete for talent is an advantage for the operator company, as they can choose to bring responsibilities back in-house if desired, as per the contract.
- In certain cases, the involvement of trade unions and their concerns about privatization of oil and gas production may pose obstacles. It is crucial to create a model that ensures the interests of both parties and addresses safety and quality concerns.
- From the Asset Partner's perspective, the advantage lies in the business itself. However, there may be disadvantages if they do not gain sufficient insight and access to the operator company's fields, impacting the quality and safety aspects essential for a secure and successful partnership.

Overall, the partnership model offers benefits such as access to expertise, cost reduction, increased efficiency, improved focus on health, safety, and the environment, and closer collaboration. However, concerns about loss of control for the operator company and the potential for higher operating costs compared to in-house operations need to be considered. It is important to evaluate the specific circumstances and determine whether an Asset Partner arrangement is the most cost-effective and efficient approach or if alternative models like MMO 2.0 (modification, maintenance, and operations) may be more suitable for the operator company's needs.