SCENARIO PLANNING DEVELOPMENT IN FACING FUTURE CHALLENGE FOR POWER RENTAL INDUSTRY (CASE STUDY: SM COMPANY)

FINAL PROJECT

In partial fulfilment of the requirements
for the master's degree
from Institut Teknologi Bandung

By
Bagas Pryambodo H. A.
Student ID: 29121118
(Master of Business Administration Program)

INSTITUT TEKNOLOGI BANDUNG
February, 2022

ABSTRACT

SCENARIO PLANNING DEVELOPMENT IN FACING FUTURE CHALLENGE FOR POWER RENTAL INDUSTRY (CASE STUDY: SM COMPANY)

By
Bagas Pryambodo H. A.
Student ID: 29121118
(Master of Business Administration Program)

The diesel power rental industry is currently in an energy transition period. Policy changes in reducing the use of non-renewable fuels are factors that can reduce customer demand. Several policies, such as the Paris agreement, followed by a general plan for electricity supply, then a general plan for national energy that focuses on increasing the use of renewable energy encourages the shift from fossil fuels to renewable sources. These factors will affect the electricity rental industry which still uses fossil fuels.

Scenario planning is chosen to provide possible scenarios that may occur in the future by carrying out an analysis of implications & options. This scenario can provide an initial danger signal to be used as an indicator of movement in an industry which will help companies to act and choose the best strategy going forward. Scenario planning is used as a tool for strategic thinking that can be integrated into corporate strategic planning.

qualitative method with semi structural interview tools was used to collecting the data. Supporting analysis of both external factors such as general environment & industry analysis as well as internal resource-competencies was carried out to determine what factors affect uncertainty in the industry, in overcoming future uncertainties scenario planning carried out in this study. The strategic recommendations that were presented have the potential to assist in the future alignment of the company's strategy.

Keywords: Power rental industry, generator set, scenario planning, renewable energy transition

ABSTRAK
Pengembangan Perencanaan Skenario dalam Menghadapi Tantangan Masa Depan untuk Perusahaan Industri Penyewaan Tenaga Listrik

Oleh
Bagas Pryambodo H. A
29121118
(Program Studi Magister Administrasi Bisnis)

Industri penyewaan tenaga listrik berbahan bakar diesel sedang berada dalam masa transisi energi. Perubahan kebijkakan dalam mengurangi penggunaan bahan bakar tidak terbarukan menjadi faktor yang dapat menurunkan permintaan pelanggan. Beberapa kebijakan, seperti kesepakatan Paris, yang diikuti dengan rencana umum penyediaan tenaga listrik, kemudian rencana umum energi nasional yang berfokus pada peningkatan penggunaan energi terbarukan mendorong peralihan dari bahan bakar fosil ke sumber terbarukan. Faktor tersebut akan mempengaruhi industri penyewaan tenaga listrik yang masih menggunakan bahan bakar fosil.

Perencanaan scenario dipilih untuk memberikan kemungkinan skenario yang terjadi di masa depan dengan melakukan analisis implikasi, & opsi. skenario tersebut dapat memberikan sinyal bahaya awal untuk dijadikan indicator pergerakan pada sebuah industri yang akan membantu perusahaan untuk bertindak dan memilih strategi terbaik kedepannya. Perencanaan skenario digunakan sebagai alat untuk berpikir strategis yang dapat diintegrasikan ke dalam perencanaan strategis perusahaan.

Metode kualitatif dengan melakukan semi structural interview digunakan dalam mengkoleksi data. Analisis pendukung baik faktor eksternal seperti lingkungan general dan analisis industri maupun internal sumberdaya-kompetensi dilakukan untuk menentukan faktor apa saja yang mempengaruhi ketidakpastian di dalam industri, dalam mengatasi ketidakpastian masa depan perencanaan scenario dilakukan pada penelitian ini. Usulan strategis yang diberikan dapat menunjang keselarasan strategi perusahaan kedepannya.

Keywords: Industri Penyewaan tenaga listrik, Generator set, Perencanaan Skenario, transisi energi terbarukan

SCENARIO PLANNING DEVELOPMENT IN FACING FUTURE CHALLENG FOR POWER RENTAL INDUSTRY (CASE STUDY: SM COMPANY)

By

Bagas Pryambodo H. A
Student ID: 29121118
Master of Business Administration Program

Institut Teknologi Bandung

Approved

February 09th, 2023

Supervisor

(Dr. Eng. Pri Hermawan)

DECLARATION OF NON-PLAGIARISM

Plagiarism is:

Taking, using, and submitting a work of another, including an idea, writing, or invention, as if it was her or his own.

Plagiarism includes (but not limited to):

1. **quoting verbatim** the work of another without acknowledgement of the source;
2. **paraphrasing** the work of another without acknowledgement of the source;
3. **using** the idea of another without acknowledgement of the source;
4. **submitting** the work of another without identifying clearly who did the work;
5. **colluding** by submitting the work of another as her or his own with consent from the other.

I understand that Plagiarism is wrong, a breach of academic integrity,

and against Program, School, and University's Policy and Regulation.

I declare that all material in this Final Project is original, my own work, and does not involve plagiarism.

I have not allowed, and will not allow, another to copy my work with the intention of submitting it as her or his own work.

Name Bagas Pryambodo Student ID 29121118

Signed  Date February 21, 2023

Acknowledgments

All praise and thanks to Allah SWT for all of His gifts that helped the author finish the Final Project. In order to graduate from the Young Professional in Master Program of Business Administration at the School of Business Management at the Institute Teknologi Bandung, the Final Project was planned out and researched.

The relatively long time lag between the approval of the supervisor's signature and the time of submission was due to a discussion process again with the supervisor regarding the format and content of the journal; this was done for journal publication, which was required as a condition for conducting a thesis defense. The discussion process took place for the purpose of preparing for a thesis defense, which required journal publication.

The author would like to thank and be grateful to the following personnel, groups, and companies for their direct and indirect support, guidance, and help with this final project that consist of:

1. Thanks to my family for their huge help and full backing supporting throughout this academic journey.
2. I would like to thank Dr. Eng. Pri Hermawan as an advisor for this final project. Thank you for your help and guidance throughout the process of this final project.
3. All MBA ITB Bandung faculty lecturers and staff who assisted with the teaching and learning process.
4. I would want to thank everyone who took part in the survey and the interview for helping me with my capstone.
5. I would want to thank everyone in my batch 65 and also my syndicate for their help and encouragement as i have worked through my master program.

Table of Content

List of Appendixes

List of Figures

List of Tables

Chapter I Introduction

I.1 Background

Renewable energy has become a popular issue in recent years because it offers more advantages than nonrenewable energy. Beginning with energy security, economic savings, and environmental preservation, future sustainability solutions are possible. The issue of climate change produced by greenhouse gas emissions is why renewable energy is the primary emphasis and aids in mitigating its effects. The government is lowering the electricity industry's reliance on fossil fuels through various initiatives, one of which focuses on reducing the use of diesel-powered power plants. Based on the 2021 national energy balance report, the total primary energy supply is 216,378 thousand TOE with 78,372 thousand TOE or 34% being transformed directly into a power plant.

Several policies, such as the Paris agreement, followed by the general plan for electricity supply, and then the national energy general plan, which has a focus on increasing the use of renewable energy, are encouraging the transition away from fossil fuels and toward renewable sources of energy. The amount of power that might be generated from renewable sources in Indonesia is 417.9 GW (Kompas, 2021). The trend of renewable energy in Indonesia has increased from 2018-2021 see at figure I.1, shares of fossil fuel in the primary energy supply showed negative growth annual trend especially for oil and gas.

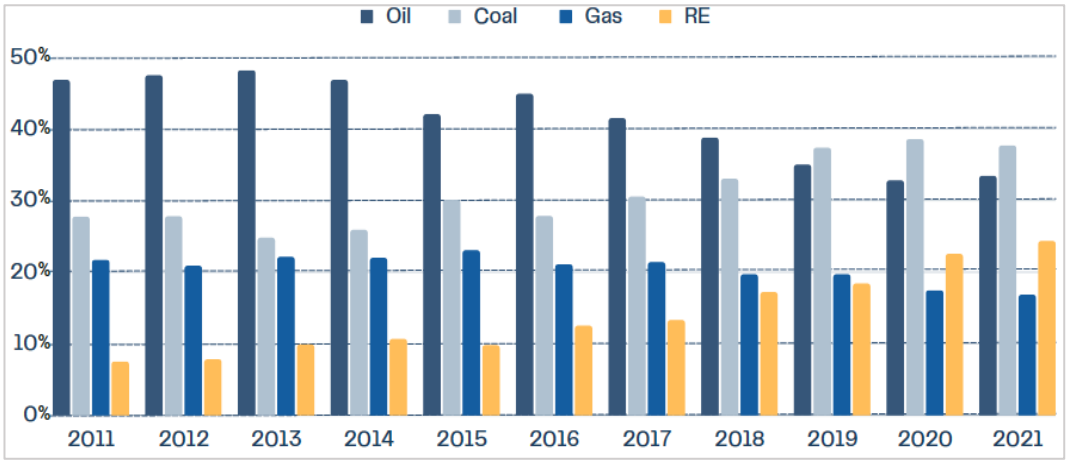

Figure I. 1. Shares of primary energy
Sources: (MEMR, 2021)

Demand will rise in 2022 in response to the post-pandemic situation, but international aids to shorten the duration of this condition will affect the rise in the percentage of renewable energy for the following year. Renewable energy is still more affordable than technologies based on fossil fuels, according to technological advancements; however, this will only happen if regulations allow it.

Along with shifting external factors dependent on one customer, changing industrial conditions also reduced demand in the company's power rental business line. This dynamic uncertainty will have a direct impact and companies must respond and mitigate against these conditions. This was the key issue driving the company's revenue decline. The company is now maintaining various projects that can still be maintained while balancing its asset base and service base due to the revenue drop.

To be able to become a leader in the power rental business market, mistakes in making decisions are made at least once. In direct comparison, the business had previously earned a prize for being the best private electrical firm in the Brand Awards category in 2015.

Providing scenarios that occur in the future will help the company to act and choose the best strategy going forward. According to Ringland on 2002 considers scenario analysis as a tool for strategic thinking, which can be integrated into strategic planning. By taking a scenario planning approach, it is possible to identify early warning signals and implement these signals so that they can choose the right strategy to face the future challenges and minimize decision making errors.

I.2 Company Profile

The SM Company has been around for more than 20 years and provides various electrical services. SM is an integrated company that specializes in providing services related to the delivery of electrical solutions. Its operational activities span the entirety of Indonesia. SM's commercial endeavors, as well as its goods and services, can benefit from the assistance of its subsidiary companies. The following is an in-depth analysis of the company's organizational structure, which is depicted in figure I.2. The company has over 600 employees responsible for carrying out all of the business processes connected to its human resources.

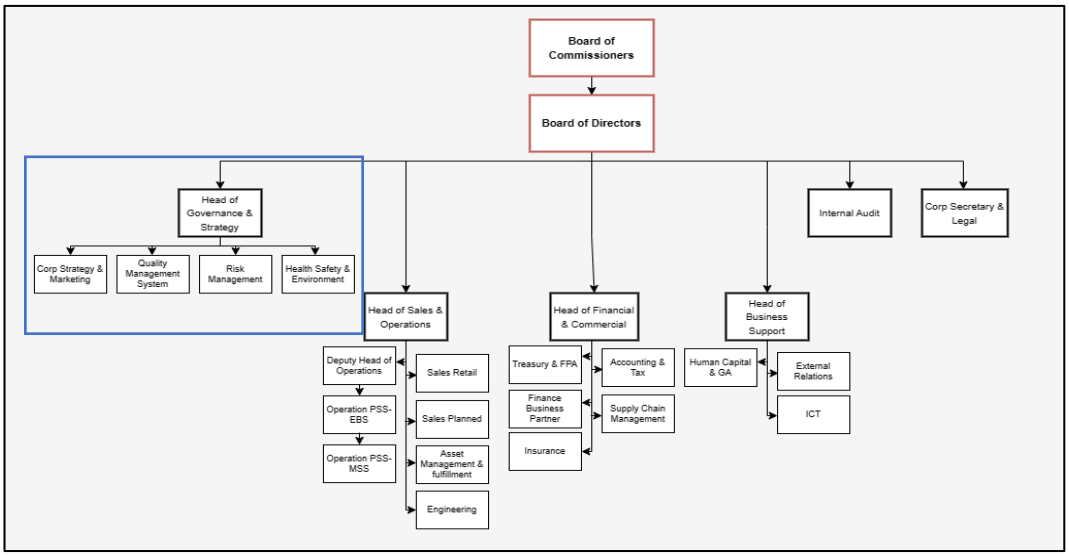

Figure I. 2. Organizational Structure
Sources: (SM Company, 2021)

As a provider of electricity solutions, the company has three business segments, including temporary power, which is the provision of gas- or diesel-based power with varying capacities up to 10,000 KVA, energy efficiency service, which is the capacity and efficiency checking of gas and diesel power generation systems, and operation & maintenance, namely the operation, repair, and maintenance of electricity assets. Customers of the company come from a variety of sectors, including mining, oil & gas, manufacturing, retail, and construction in addition to the electrical and government sectors.

Regarding corporate structure, SM Company have three parent entity that consist of PT GM, PT ABM, and PT TR. SM Company has two subsidiaries: NB Company, which operates within the field of Renewable Energy Independent Power Plant (IPP), and PA Company, which operates within the field of Thermal Energy Independent Power Plant (IPP).

The stakeholders involved in becoming resource persons in gathering data and discussing scenario planning can be found in the blue box in figure I.1. This research was compiled with their input; the blue box contains their information. The Department of Governance and Strategy Team provides opinions regarding the business environment based on their expertise and experience in the power rental industry, which the author attempts to analyze to create scenario planning. These

opinions are based on the fact that the team members have worked in the industry for a significant amount of time.

I.3 Business Issue

In order to reduce its high production costs, PLN reduced the usage of temporary power, particularly diesel power plants mentioned in the 2018–2027 RUPTL. Even while the use of PLTD is limited and concentrated on regions with renewable energy fuels that transmission has not yet reached, it is not instantly halted. The formation of RUEN (National Energy General Plan with Renewable Energy Node) was recommended in connection with the issue of boosting the use of renewable energy, which was also accepted in the 2015 Paris Agreement. The RUEN National Energy General Plan with the target of achieving an optimal primary energy mix in the EBT sector at least 23% in 2025 and at least 31% in 20250 and petroleum is less than 25% in 2025 and less than 2050. (MEMR, 2017)

Many nations, including Indonesia, are quite concerned about the emissions from fossil fuel-powered power plants. According to the 2021–2030 RUPTL, the PLN strategic plan is currently being used to carry out dieselization, specifically the PLTD to renewable energy conversion program. This program aims to reduce the use of fossil fuels and increase the efficiency of generator costs by replacing PLTD with renewable generators and technology tailored to local energy.

Therefore, PLN's focus is on using renewable power plants to reduce greenhouse gas emissions, as the government's strategy for the energy mix from NRE in 2025 is of the utmost importance. The addition of 10.6 GW of renewable energy sources until 2025 and 18.8 GW until 2029 is the anticipated goal to be met (PLN, 2021). But in 2022, only 12.8% of current energy use is made up of renewable sources; the remaining 87% is still made up of fossil fuels. (IESR, 2022)

Regardless with the use of renewable energy that is still minimal, it will produce positive and negative impacts for industries that still use fossil fuels. The negative impact is that the program to reduce greenhouse gas emissions will be further enhanced and companies engaged in non-renewable energy must act immediately to maintain their business, while the positive impact is that the comparison of the

usage ratio also indicates that there is no readiness to transition to renewable energy and fuel because fossils are still the primary source of energy needed.

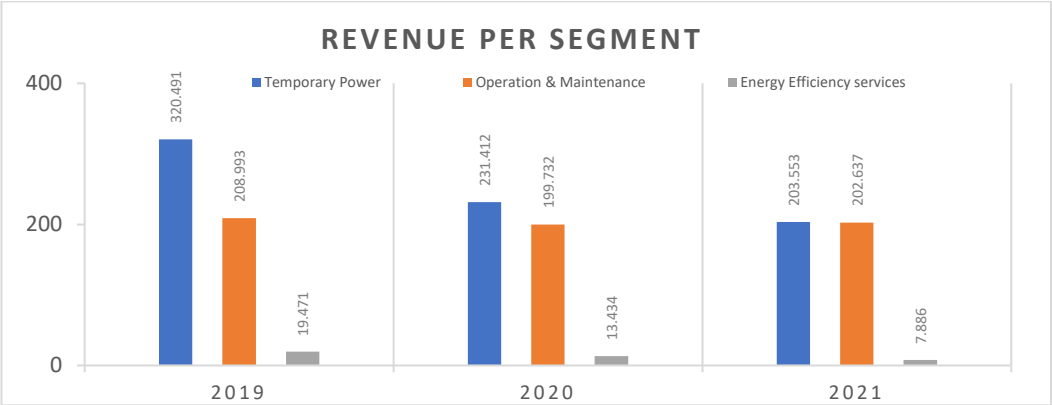

Figure I. 3. Revenue per Segment
Source: SM Company Annual Report, 2021

Some of these regulations have an impact on businesses that have a main business core, namely power rental with diesel fuel. As seen in the image above (figure I.3), power renting remains the company's primary source of income. As a result, this decision will also have an impact on the company's overall revenue because it is overly reliant on a single customer. In general, from some of the company's business lines, the company's revenue continues to decline which may be caused by these external factors.

Historically, the company has experienced a decline in stability in revenue due to an error in strategy estimation caused by external factors such as changing regulations and the effects of COVID-19. The business strategy team of the organization is aware that they cannot rely on business segments that continue to use fossil fuels. Long-term plans have been established to address this, but an estimation error led to a fall in the company's performance plans.

The decision-making process for both short- and long-term initiatives will be affected by external factors that are too dynamic and have varying degrees of uncertainty and impact. Based on an early warning signal that provides an overview of the industry's movement and many indicators designed to aid the decision-making process of senior management, the most appropriate steps for business continuity are taken. The following subchapter will provide additional information on the research topics and objectives that will be addressed in this study.

The company condition is analyzed using tools known as stakeholder maps. These maps are used to identify business problems based on a question and answer session with informants. The following is a map of the problem as seen by all stakeholders.

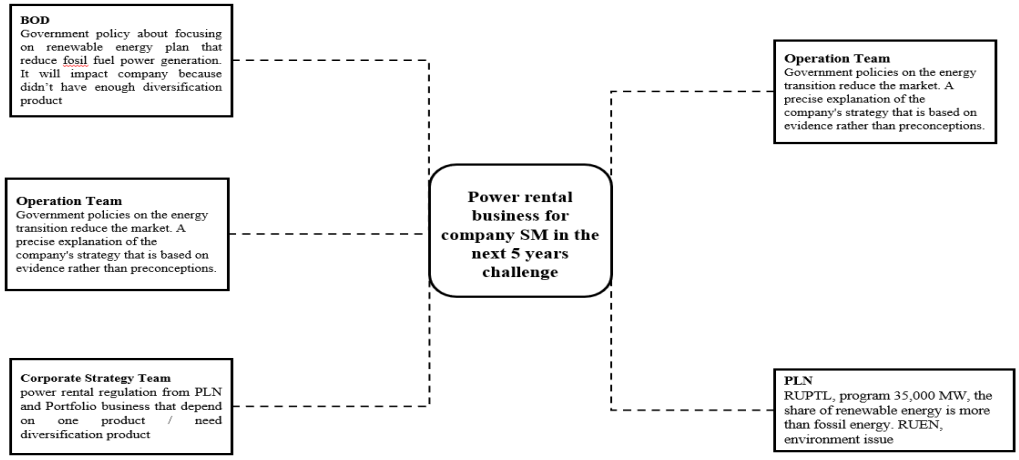

Figure I. 4. Stakeholders Map analysis
Source: Author analysis

In general, the issue the organization is currently facing is the policy of external stakeholders to minimize the usage of diesel generator power, which will diminish demand from the market sector utility organization. In this instance, the company's dependence is due to its lack of product diversity.

I.4 Research Question and Research Objectives

The research questions and research objectives that the author wants to address are listed below.

Research Question:

1. What are driving forces and critical uncertainty will impact the business in over next five years issue?

2. What kind of possible scenario for this business?

3. What are implications and option for reach scenario?

4. What is the early warning signals for company over the next five years?

Research Objectives:

1. Identify and analysed the driving forces and critical uncertainty that impact the power rental business over five next years

2. Identify implications and options of each scenario to help company develop strategy for the next five years

3. Identify early warning signals and implementation plan to guide through the next five years challenge

The aforementioned research objectives and research questions were developed with the hope of elucidating the business difficulties and dynamics of the power renting market in order to assist enterprises in making the best decisions for their business continuation.

I.5 Research Scope and Limitation

In order to limit the extend of the research trends, a time horizon for this research is next five years, based on the number of possible future possible issues this thesis is limited by maximum three key focal issues with two axis critical driving forces to build the scenario. The scenarios will be narrative of four conditions and completed by early warning signs, implications, and options of each scenario.

In conducting this research the author is not part of the internal company so that boundaries such as time, access to data limitations, and data retrieval methods are adjusted to the company's willingness. Boundaries on formulation research's strategy ideas were developed by scanning the environment and issues in general using a methodology based on evidence on book, papers, journals, and reports.

Chapter II Literature Review

II.1 Theoretical Foundation

II.1.1 Scenario Planning

Scenario Planning is a disciplined process for developing alternative views about an organization's external future by analyzing key uncertainties that can significantly change the landscape (Schoemaker, 1995). Scenarios are not states of nature (they are seldom exhaustive) nor probabilistic predictions but, rather, coherent narratives of what could happen (Wack, 1985). Companies should use scenario planning the more the following conditions apply: (1) Uncertainty is high (relative to the organization's ability to predict or adjust), (2) Too many costly surprises and blind spots have occurred in the recent past, (3) Insufficient new opportunities are perceived and generated by the organization, (4) The quality of strategic thinking is low (strategic planning has become perfunctory), (5) The industry has experienced significant change or is about to be transformed, (6) A common language and framework is desired for discussion, without stifling diversity, (7) Strong differences of opinion exist among leaders, each of which has merits, and (8) Company rivals are using scenario planning to gain competitive advantage in the future (M. Augier, 2016). Scenarios are vivid descriptions of plausible futures (Lindgren & Bandhold , 2009) which consists of several components as shown below (figure II.1.1).

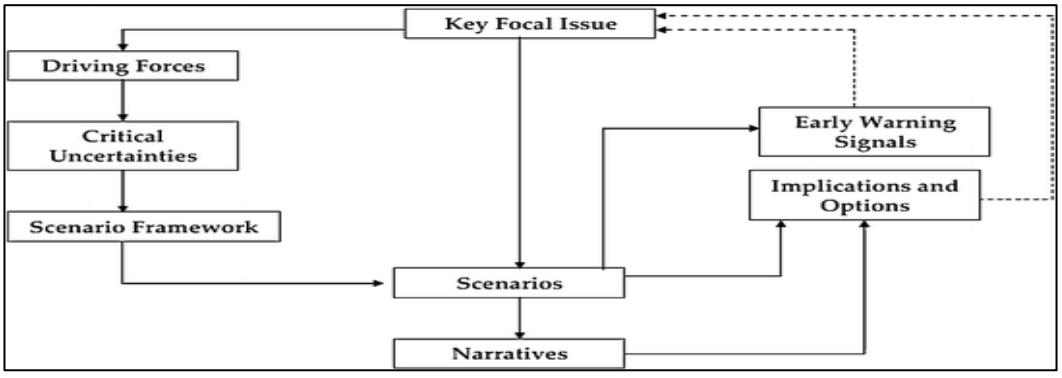

Figure II.1. 1. Scenario Planning Component
Sources: (Garvin & Levesque , 2005)

Lindgren & Bandhold on their research emphasized two critical points as a success factor in fast moving and complex business environment which is speed response

and variety to handle complexity through flexibility, adaptation, and resilience. The aim of scenario analysis is not to obtain forecasts of the future, but to highlight crucial uncertainties that may influence the strategic decisions that managers have to make.

Key focal issue is the basis to construct scenario planning, as an issue that important for upcoming decision or a strategic uncertainty with long-range consequences for the advantages of stakeholders. Scope and timeframe for choices and concern should be clearly identified. this phase sets the perspective to be selected for the period under study (Gausemeier, et al., 1998)

Driving forces are the stages for gathering data on trends and factors that significantly alter the future course. The macroenvironment's driving forces are key variables and their trends, which have an impact on the primary problem.

Critical uncertainties are a a variety of driving factors that contribute to a high degree of uncertainty and have a significant influence on the changes that occur in an industry. There are two types of uncertainty, namely uncertainty that can be quantified and measured and uncertainty that cannot be quantified and measured. Both of them will produce different types of scenarios, namely countable scenarios and uncountable scenarios. This stage is obtained from the results of discussions with speakers to determine what factors have the most influence on the scenario you want to produce.

Scenario framework critical uncertainties will be plotted into matrix 2x2 with four different quadrant of scenario framework. scenarios provide a way to handle uncertainties.

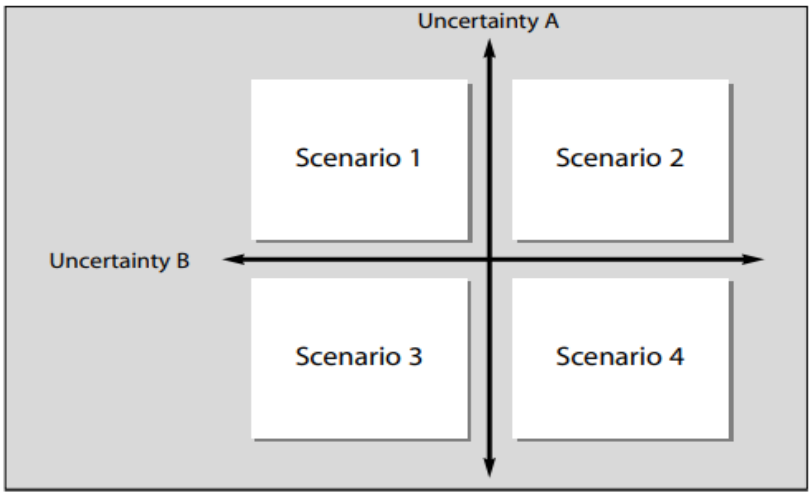

Figure II.1. 2. Scenario Framework
Sources: (Lindgren & Bandhold , 2009)

Scenario list of different future plan as the result of scenario and critical uncertainty then explored into narrative story. The logics are defined by exploring the interactions of the most uncertain and important drivers such that alternative frames are created, each representing a divergent yet plausible scenario. Scenario should be plausible, distinct, consistent, relevant, creative, and challenging (Maack, 2001)

Narratives at this stage the emphasis turns to fleshing out a storyline that will trace the development of a particular phenomenon from the near future to a more distant time horizon. Each narrative is made by exploring the implications of each alternative on the issue based on the parameters set from the interaction of the key driving forces.

Implications process of exploring implications that might happen for each alternative scenario, including identification of strengths and vulnerabilities, alternative strategies, and capabilities.

Early warning signals identification of leading indicators that highlight the likely emergence of one scenario or another. scenarios are an appropriate way to recognize 'weak signals', technological discontinuities or disruptive events and include them into long range planning; as a consequence, the organization is better prepared to handle new situations as they arise and promotes pro-active leadership initiatives

The scenario creation stage consists of orientation, exploration, and scenario creation, while the strategy development stage consists of option consideration and integration in light of the stage of the process shown in figure II.1.3.

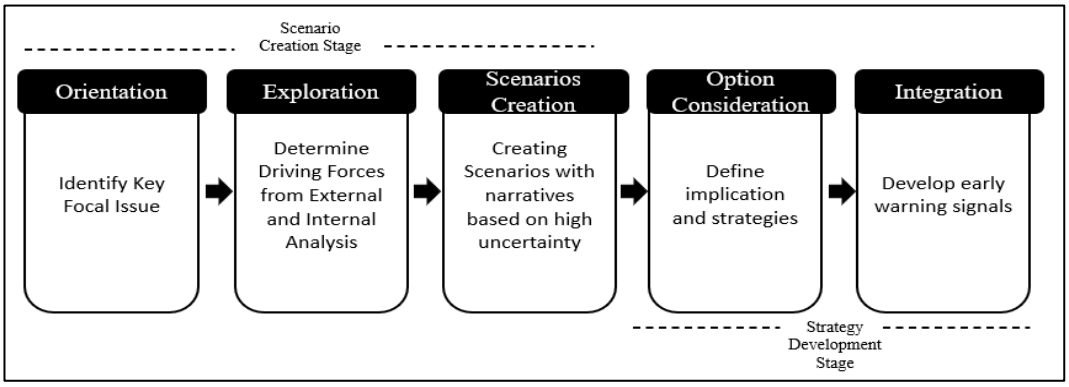

Figure II.1. 3. Scenario Process stage
Source: edited from (Garvin & Levesque , 2005)

The orientation stage serves as a means of defining the key focal issue. Issues are conceptualized by individuals or small groups, They can become organizational when issue promoters engage in sense giving focused on legitimating the issue (Ramirez, et al., 2013) and possibly categorizing the issue as an opportunity or threat (Dutton & Jackson, 1988) . The Exploration stage is the stage for determining the driving forces that affect issues based on variable levels of uncertainty, trends and also the level of impact that will affect a business/industry in the next few years. Scenarios creation stage after constructing a matrix with the highest uncertainty and trend variables, scenario variables are created by turning the matrix into a narrative story.

The option consideration stage is the process of determining the implication of variables and options from the scenarios created. In this stage, strategy determination is also carried out based on variable strategy alternatives and strategy selection from the implication that has been made. The integration stage is the process of developing easy warning signals. Indications or early warning signals may be generated both internally within the company by an elevated risk level or the occurrence of precursors and externally by a variety of factors (William & Pasman, 2021). Determine early warning signals is important because it might assist you in staying ahead of trends and enables to favorably influence a trend as it emerges and before it becomes entrenched.

Application of Scenario Planning

Scenario planning in the energy industry has been tested, The Royal Dutch Shell Corporation is credited with the introduction of scenario analysis in the private sector, where it was the first to perform a 'can use' scenario analysis successfully (Schwartz, 1996) Shell succeeded in a highly competitive environment by planning for a scenario involving a potential embargo by the oil-producing countries in the early 1970s, when its competitors were still using traditional forecasting methods and were caught unprepared when this scenario became a reality (T, et al., 2009). Since then, over 50% of the largest European and US companies have adopted scenario analysis to support their long-term planning. In electricity industry (Grace & Claudia, 2019) has adopted scenario planning for the electricity industry in Colombia and generate output robust adaptive strategy that help companies could better face the transition from current business to new alternatives.

II.1.2 External Analysis

II.1.2.1 Pestle

To determine the continuity of the company's business in the future, external analysis is crucial to, Pestle analysis is the broad macro-environment of organizations in terms of political, economic, social, technological, environmental, and legal factors (Johnson, et al., 2008) the analysis defines the trends, determining the development of the industry. Political factors result from the processes and actions of government bodies that can influence the decisions and behaviour of firms. Economic factors in a firm's external environment are largely macroeconomic, affecting economy-wide phenomena. Sociocultural factors capture a society's cultures, norms, and values. Because sociocultural factors not only are constantly in flux but also differ across groups, strategic leaders need to closely monitor such trends and consider the implications for firm strategy. The technological factors cover the application of knowledge to the development of new processes and products. Environmental factors cover extensive environmental concerns such as the natural environment, global warming, and sustainable economic growth. The natural and commercial worlds can no longer be separated

by strategic leaders; they are inexorably intertwined. All of these legal variables might have a direct impact on a company's profit potential.

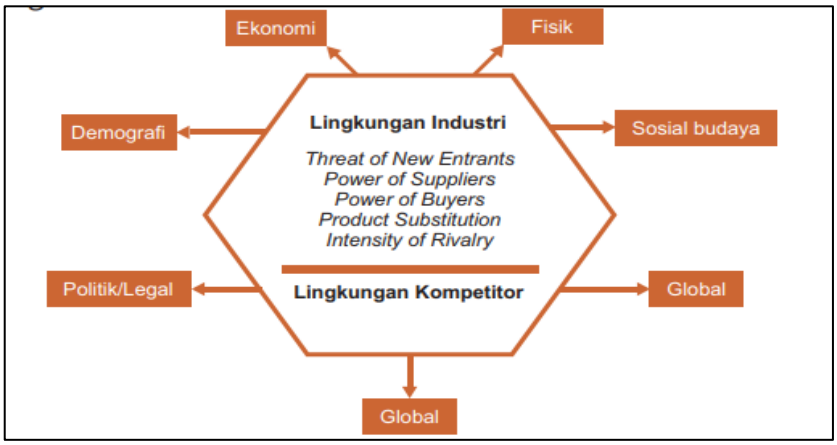

Figure II.1. 4 Pestle Analysis
Sources: (Wandebori, 2019)

Upon completion of the external analysis, the Opportunity and Threat variables will be obtained and used to inform the formulation of corporate, company, or functional strategies. (Wandebori, 2019).

II.1.2.2 Porters Five Forces

Porter's five forces model to help strategic leaders understand the profit potential of different industries and how they can position their respective firms to gain and sustain competitive advantage (Rothaermel, 2021) Porter's model identifies five key competitive forces, see figure II.1.5.

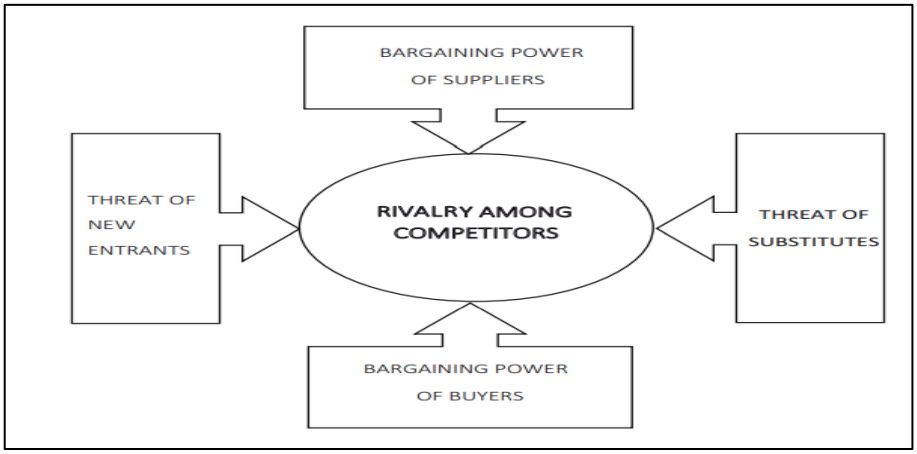

Figure II.1. 5. Porter analysis
Source: (Porter, 2008)

Threat of Entry describes the risk of potential competitors entering the industry. In this case, entry barriers determine whether an organization can easily enter the industry often significantly predict industry profit potential. Industry is attractive it is when difficult for potential competitors to enter into the company's market and Industry is not attractive it is easy for potential competitors to enter into the market

Power of Supply This power is analyzed from the standpoint of how easy it is to find on the market the alternative to existing suppliers, in the event that the quality of supplier cooperation is unsatisfactory, or that the supplier increases the prices. Industry is attractive is when there are enough alternative suppliers present on the market. Industry is not attractive is when it is difficult for the company to find alternative for the current supplier.

Power of Buyers The power of buyers relates to the pressure an industry's customers can put on the producers' margins by demanding a lower price or higher product quality. it is necessary to note that the fewer customers the company has, the more power they have to influence the company. Industry is attractive is when the customers find it difficult to transit from one company to another and to cooperate with another company. Industry is not attractive is when the customers have no difficulty as to the transition from one company to another and cooperating with another company.

Threat of Substitutes, The threat of substitutes is the idea that products or services available from outside the given industry will come close to meeting the needs of current customers. Porter notes that "A substitute performs the same or a similar function as an industry's product by a different means" (Porter, 2008). Industry is attractive is when it is problematic for the customers to find an alternative for the offered products or services. Industry is not attractive is when the customers can easily find an alternative for the offered products or services.

Rivalry among existing competitor, Rivalry among existing competitors describes the intensity with which companies within the same industry jockey for market. According to Porter, "High rivalry limits the profitability of an industry" (Porter, 2008). Industry is attractive is when there are not a great number of companies that

are in the state of competitive rivalry. Industry is not attractive is when there are a great number of companies on the market that are in the state of competitive rivalry.

II.1.3 Internal Analysis

In addition to looking externally, analysts need to assess how the company's internal strategic factors, such as its ability to take advantage of opportunities and defend against threats, may play a role in the company's success. The purpose of this internal investigation — also called an organizational analysis — is to identify and strengthen the strengths and capabilities already present within the company.

II.1.3.1 Resources based – Competitive Advantages Analysis

Theoretical framework that explains and predicts firm-level competitive advantage. The main aim of the VRIO analysis is to estimate the situation inside the company, to define its unique resources and capabilities that make it competitive on the market (Peng , et al., 2009). This framework is implied in the resource-based model, identifying certain types of resources as key to superior firm performance ((Barney & Hesterly, 2014)

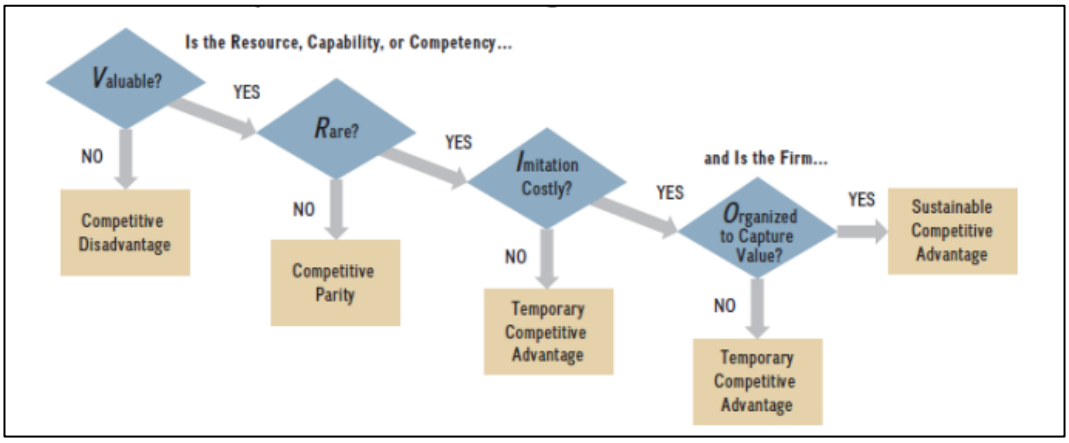

Figure II.1. 6. Resource based analysis
Sources: (Rothaermel, 2021)

The categories of resources are classified into tangible resources, or assets that can be seen and measured, such as financial, physical, and organizational, in order to conduct the study. Intangible resources are the next class of asset. These are assets like people, innovation, and reputation that are often very ingrained in the history

of the company. A resource must be valuable, rare, costly to imitate, and organized to capture value to serve as the foundation of a competitive advantage.

Valuable, is a resource is valuable if it helps a firm exploit an external opportunity or offset an external threat, resources that cannot meet these conditions cause a competitive disadvantage.

Rare, a resource known as rare, which is relatively hard to come by and can give a few businesses a short-term competitive advantage.

Imitation, other organizations find it challenging to replicate imitation. A corporation can gain a brief competitive edge if its rivals are unable to mimic methods based on resources that are valuable, uncommon, and expensive to imitate.

Organized to capture value The characteristic of having in place an effective organizational structure, processes, and systems to fully exploit the competitive potential of the firm's resources, capabilities, and competencies.

II.2 Conceptual Framework

Conceptual framework either graphically or in narrative form the key factors, variables, or constructs and the presumed relationships among them. Frameworks can be simple or elaborate, commonsensical or theory driven, descriptive or causal (Ravitch & Riggan , 2016).

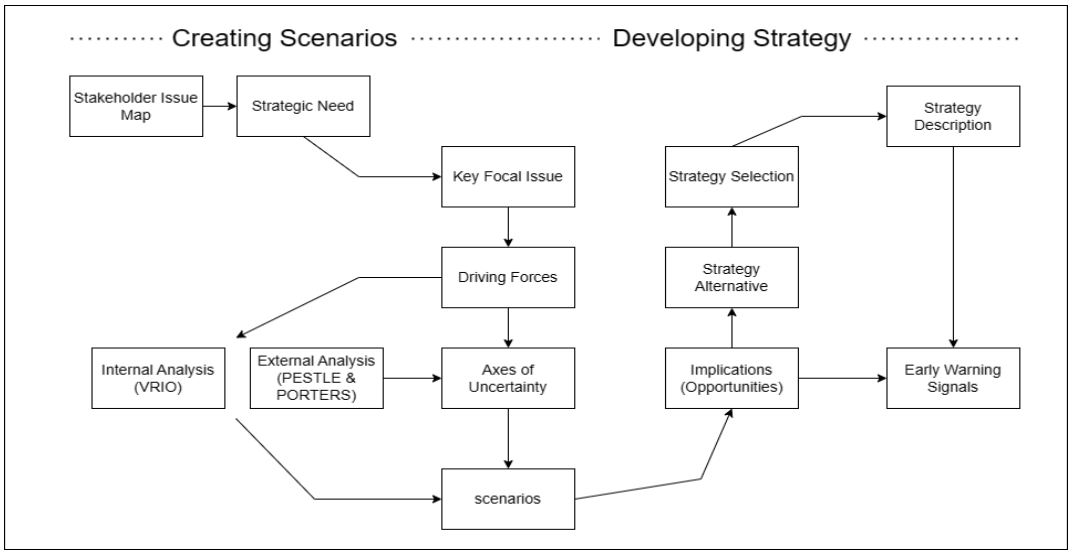

Figure II.2. 1 Conceptual Framework
Sources: adopted from SBI Approach (SBI, 2022)

The conceptual framework shown above adopts a modified version of the SBI approach paradigm for scenario planning. In general, it comprises of two processes: scenario creation and strategy development.

Based on the outcomes of the summary stakeholder map, the process of creating a scenario begins with identifying the necessary strategic needs. Determination of key focal issues based on future challenges that the industry will face; generation of driving factors that can impact the industry based on the results of the industry's business environment analysis for internal analysis using the VRIO framework and external analysis using Pestle analysis and Porter's generic strategy to determine the attractiveness of an industry. After identifying the high-uncertainty, high-impact driving elements, an analysis of uncertainty axes may be conducted, and then the process of scenario design can be initiated. Potential developments are also considered, linking the present to a specific picture of the future (Schwartz, 1996)

For the second process scheme, called strategy development, determining the implications and options of each plan is the initial step. By examining the implication and options, organizations are able to establish plans to mitigate potential risks and capitalize on possibilities. While the objective of choice analysis is to make organizations can be better prepared to respond quickly and effectively to changing market conditions, This makes the company's strategy more robust and means that it can be applied in various potential future situations (Schwartz, 1996).

Determination of early warning signals is carried out based on the previous stage by providing indicators or variables that are always monitored, refers to (Schoemaker, 1995) and (Van Der Heijden, 2005) draw attention to the importance of monitoring the environment continuously and repeating the scenario process if drastic changes occur. Alternative strategy stages and selection strategies can be carried out by considering many aspects related to the scenario. This makes the company's strategy more robust and means that it can be applied in various potential future situations (Schwartz, 1996)

Scenario planning is a method that have a inspiration for generating idea and as filters through which new ideas and project can be passed, According to (Lindgren & Bandhold , 2009) these are effective tools related to strategic planning for

medium to long-term planning under uncertain conditions.. The differences between traditional strategic planning approaches and scenario planning are illustrated in

	Traditional planning	*Scenario planning approach*
Perspective	Partial, 'Everything else being equal'	Overall, 'Nothing else being equal'
Variables	Quantitative, objective, known	Qualitative, not necessarily quantitative, subjective, known or hidden
Relationships	Statistical, stable structures	Dynamic, emerging structures
Explanation	The past explains the present	The future is the *raison d'être* of the present
Picture of future	Simple and certain	Multiple and uncertain
Method	Determinist and quantitative models (economic, mathematical)	Intention analysis, qualitative and stochastic models (cross-impact and systems analysis)
Attitude to the future	Passive or adaptive (the future will be)	Active and creative (the future is created)

Figure II.2. 2. Differentiation scenario planning with traditional planning
Sources: (Lindgren & Bandhold , 2009)

Some of the reasons why scenario planning is not widely used are:

- Scenario planning does not give one single answer about the future. Therefore, it does not provide the security that is often required in decision making.
- Counterintuitive to managerial simplicity, Scenario planning is a more holistic or systemic approach to planning than traditional methods.
- Soft methods and soft answers, Scenario techniques are usually qualitative, based on reasoning and intuitive pattern recognition The results are often presented in qualitative terms that fit poorly with traditional numbers-oriented cultures.
- Time consuming, top managers are so rarely involved in scenario projects is that workshop-based methods are time consuming in terms of the number of hours and days the participants need to spend to get thorough results.

There is a need for a higher level of strategic thinking that integrates uncertainty-based futures thinking (scenarios) and more traditional strategic planning methods to be able to cope with challenges in business environments and to be able to exploit opportunities created. Scenario planning is used when times are uncertain, scenarios are particularly useful when it comes to paradigmatic or non-linear change. For instance, when product categories are reaching a level of "over-maturity" and need to be replaced with something new, or when faced with rule-breaking competition

that is creating a new business logic, these are both examples of situations in which new products or approaches are required.

There is also another method namely strategic planning, is a method that helps organizations set goals and objectives and develop a plan to achieve them. It involves analyzing the organization's current position, identifying opportunities and threats in the external environment, and making decisions about how to allocate resources and implement strategies to achieve the desired outcomes. Researchers argue that, in such conditions, traditional approaches to strategic planning are unable to produce high-quality strategic decisions. Specifically, they criticize the belief, underlying traditional strategic planning approaches, that plans should be developed for a single future direction (Wulf, et al., 2013). Strategic planning is more rigid, lacks creativity, is short-term, and not flexible in rapidly changing environments, while scenario planning has early warning signals that can indicate a dynamic business environment and help prioritize resources and investment based on strategic goals that align with the current business issue.

Based on the company's historical and contemporary situations, which have begun to experience the energy transition age towards the renewable energy era, scenario planning is a suitable evaluation technique for testing existing business concepts, strategies, and products. The type of scenario used in this research is a combination of prescriptive and descriptive scenarios. Prescriptive scenarios are scenarios that describe the preferred future that are designed to provide guidance on how to achieve a desired future state, and they often outline a set of actions that need to be taken in order to get there. Descriptive scenario scenarios that describe the future as it might happen, based on a set of assumptions about the future state of the world.

Developing a new company concept or product that will endure in the future is motivated by the realization that the offered product or service will face challenges in the future. Using scenario planning techniques can provide explore different possible futures, to identify potential risks and opportunities, and to inform the development of contingency plans and more over scenarios used to inform the development of strategic plans and to help organizations align their activities with their long-term goals.

Chapter III Research Methodology

III.1 Research Design

According to Kerlinger Research design is the plan, structure and strategy of investigation conceived to obtain answers to research questions and to control variance. Research design focuses upon turning a research question and objectives into a research project, it considers research strategies, choices and time horizons (Robson, 2002).

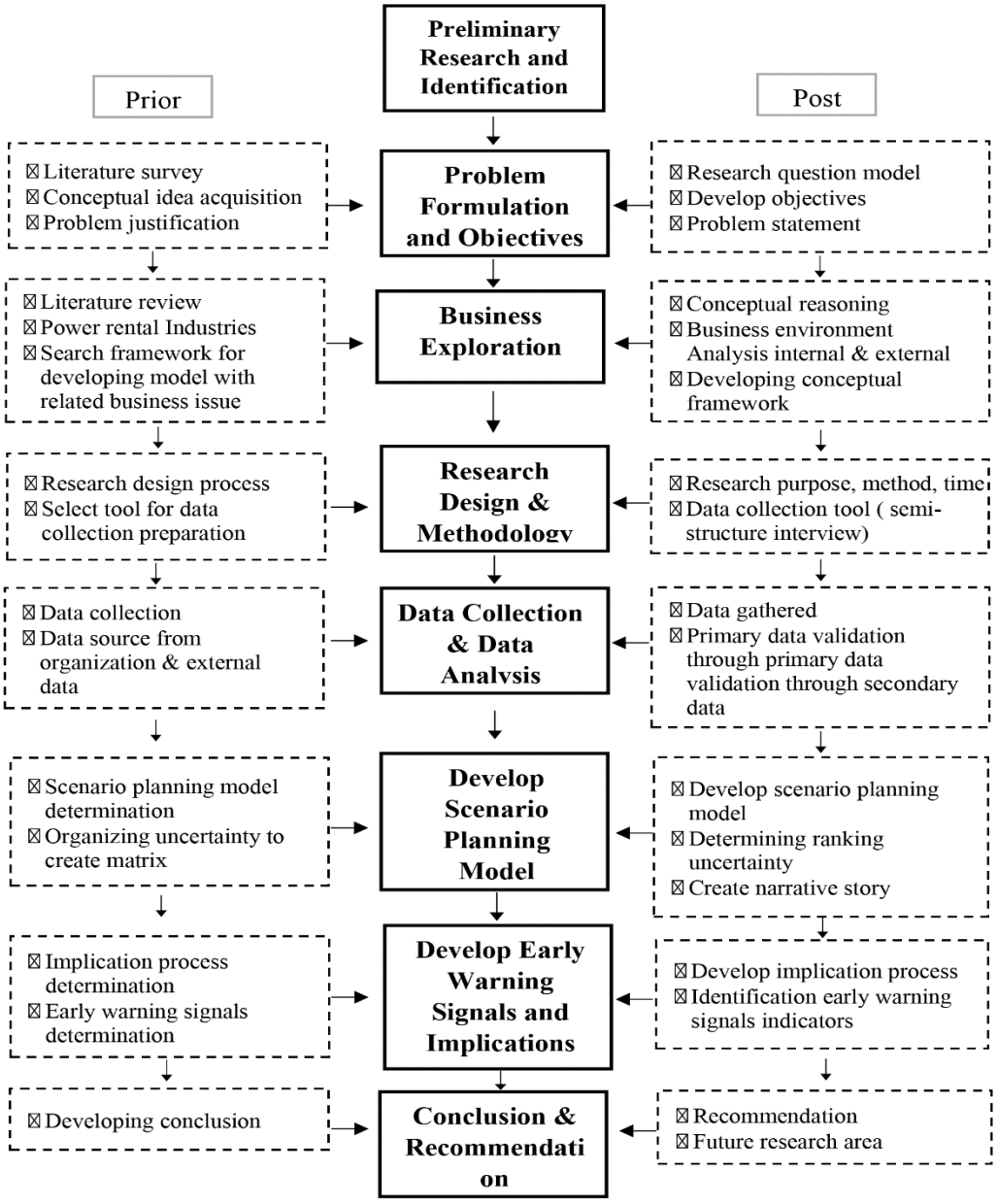

Figure III. 1. Research Design
Sources: Edited from (Kassu, 2019)

This research purpose is a descriptive research design to determine scenario planning for businesses in the power rental industry in facing future challenges. This approach provides researchers with a profile of pertinent phenomena with related elements from an individual, organizational, and business-focused perspective, a descriptive study portraying an accurate profile of persons, events or situations' (Robson, 2002). This research design helps in the analysis of answers based on the information gathered from a variety of respondents on the topic of how the business climate and future prospects of the power rental industry would be affected by problems in the following five years. The entire research flow and design process are displayed in above figure III.1.

Based on the time horizon, this thesis is a cross-sectional design. A cross-sectional design is used for research that collects data on relevant variables one time only from a variety of people, subjects, or phenomena, the data collection process is carried out in a short time frame.

III.2 Data Collection Methods

The type of data used consists of primary data and secondary data. The primary method to collect data used in narrative approaches is through semi-structured interviews with the tools used in the form of semi-structured interviews. The secondary data can provide a useful source from which to answer, or partially to answer, your research question consisting of annual reports organization, published summaries from government, and disclosure summaries published from third parties.

Semi-structured interviews are an activity in which the researcher will have a list of themes and questions to be covered and additional questions may be required to explore your research question and objectives given the nature of events within a particular organization (Saunders, et al., 2009). The author will send a script (Appendix A) containing the types of questions to the speakers during the negotiation process, then the duration will be determined by the speakers, the order of questions may also be varied depending on the flow of the conversation, and during the discussion activities will be recorded with the consent of the speakers. Based on the forms of interview, this interview was conducted in a non-

standardized one-to-one manner with the internet or electronic interview type (Saunders, et al., 2009)

The sources selected to be resource persons in this thesis consist of internal organizations, namely the board of directors, department governance & strategies, engineering operational team, and also from external organizations consisting of PLN & business practitioner in power rental industry with total five people see table III.1. The reason for choosing these sources is because stakeholders are close to problems in the power rental industry in Indonesia for the benefit of the organization.

Table III.1. List of Speakers

Speakers	Position	Experiences
KP	Internal organization – board of directors	20 years
MZA	Internal Organization – Dept governance & strategies	12 years
AZ	Internal organization – Engineering Operational	10 years
PR	External organization – PLN	20 years
RS	External organization – business practitioners in power rental	9 years

Purposive or judging sampling, which enables you to choose examples that will best enable you to answer research question(s) and accomplish objectives, is based on the significance of the selected sample method. Critical cases are chosen for critical case sampling on the grounds that they can communicate a point dramatically or because they are significant. the limitations experienced when collecting this data were time restrictions, the status of the writer who was not part of the organization so that in gathering the authors adjusted the time with the

informants based on the time the informants had and not all parts of the organization were willing to become resource persons for this data collection activity.

III.3 Data Analysis Method

Qualitative method chosen because have ability to represent the views and perspectives of the participants in a study. Qualitative data are associated with such concepts and are characterized by their richness and fullness based on your opportunity to explore a subject in as real a manner as is possible (Robson, 2002). In order to construct a scenario planning model, it is necessary to consider multiple perspectives from different stakeholders regarding their opinions on a certain subject.

An approach was utilized to examine qualitative data that involved categorizing, summarizing, and arranging data using narrative (Saunders, et al., 2009). Through the use of narrative structuring, the data are arranged both chronologically and in light of the social or organizational circumstances of the research participant (Kvale, 1996). Data categorization is the initial stage; during this activity, the interview findings are processed so that they form a cohesive collection and well-organized narrative, analytical framework to continue with study.

When processing uncertainty analysis, categorization is performed based on interviews and forms supplied by informants (appendix b). Based on the specified driving force variables, the resource person will select the level of uncertainty and level of impact. If driving forces have low influence (low level of uncertainty and can be predicted & have no impact on business continuity), points are assigned on a scale of 1-3, if medium (availability of data is limited but predictable and has the potential to affect business continuity), points are assigned on a scale of 4-6, and if high (unpredictable and highly influential with business continuity), points are assigned on a scale of 7-9.

Then, the author will discover the greatest driving factors by averaging each individual's uncertainty analysis results, plotting them on a scatter plot graph, and identifying the highest driving forces.

The second stage is summarizing data. Summarizing data will compress long statements into briefer statements in which the main sense of what has been said or observed is rephrased in a few words (Kvale, 1996)A summary is generated based on the outcomes of the interview activity process, and a scenario planning model is developed that is also connected to current theory and literature. The last stage involved using all the information gathered from the interviews and literature to develop a cohesive narrative for each scenario using the developed scenario planning model.

Chapter IV Results & Discussion

IV.1 Analysis

IV.1.1 External Analysis

Politic and Legal

The government's policies and regulations are the main determinants of business continuity in this sector. In terms of PLN, a portion for new and renewable energy plants has been added in the Business Plan for the Provision of Electricity (RUPTL) 2021–2030, which is greater than the addition of fossil energy plants, which is only 46.8%. The goal stated by PLN has also changed; it now calls for Indonesia's power generating capacity to reach 99.2 GW in 2030, with 30% of the capacity going toward new renewable energy power plants. This policy can be a threat to the continuity of the power rental business which still uses power generation using fossil fuels.

Several regulations that have an effect on the company are the Minister of Energy and Mineral Resource Regulation No. 12 / 2017 state the utilization of renewable energy sources for electricity is made in order to realize national energy resilience and reduce the level of CO2 emissions. This will be a threat to the business continuity of companies that still use fossil fuels.

Central government policy to reduce greenhouse effect in the energy sector by applying more renewable energy in the national energy mix. The use of the new renewable energy mix in 2025 consists of the following composition: 23% renewable energy, 25% crude & oil, 30% coal and 22% natural gas. Based on this, power producing diesel fuel will be blocked by the above rules and policies and regulations. Presidents' election in 2024 could be change the policy and strategy if the new elected president has different thoughts with the current president. This will be a threat to the business continuity of companies that still use fossil fuels.

Currently, the installed capacity of generators in Indonesia is 74,532.94 MW with a distribution of 78.7%, namely non-renewable power plants with detailed details of PLTG 7.18%, PLTGU 16.65%, PLTU 43.88%, PLTMG 4.3%, and PLTD 6.69%. Renewable energy generators have a distribution of 21.3% (MEMR, 2021)

According to this data, there is still a wide distribution, which shows that there is still a market for businesses that provide power leasing services, which means that there could be an opportunity for the continuation of the company's business.

Harmonized Tax Regulations (HPP) Law on carbon tax and Presidential Regulation on carbon tax and Presidential Regulation which contains the economic value of carbon for achieving emissions, these laws can be opportunities for power rental business that can be one of the new market shares strategies. This is reinforced by data from the power industry sector which has the highest emissions compared to other sectors. The sector with the greatest absolute increase in emissions in 2022 was electricity and heat generation..

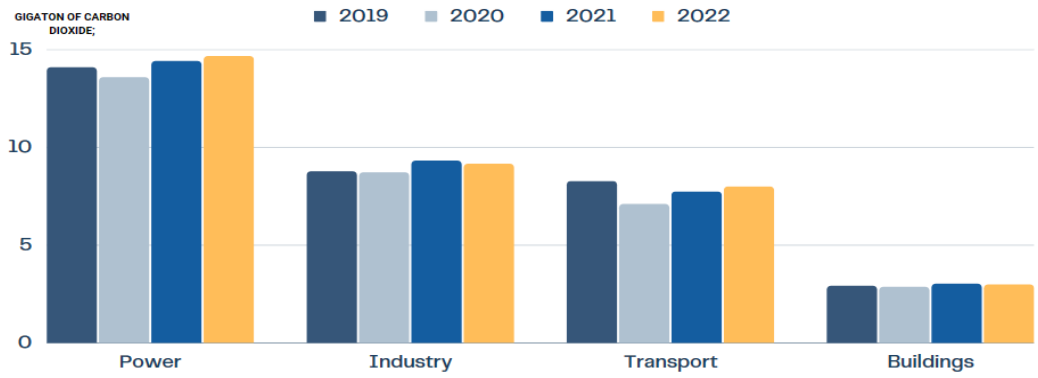

Figure IV.1. 1. Global CO2 Emission per Sector
Source: (IEA, 2023)

The electricity and heat sector's emissions rose by 1.8% (or 261 Mt) to a record high of 14.6 Gt. Changing from gas to coal in numerous regions was the primary driver of this growth: CO2 emissions from coal-fired power generation increased by 2.1%, led by Asian emerging market and developing economies (IEA, 2023).

Economic

Increase in government investment on infrastructure projects and the export of goods connected to energy are driving Indonesia's economy, which is expanding steadily at an average annual growth rate of 5%. Aligning with the demand for energy, especially for fuel and electricity, primary energy consumption in Indonesia will increase with a growth of 2.9% in 2021 (Dale S, 2021).

The poor rate of investment realization is largely to blame for the sluggish uptake of renewable energy. The amount of USD 3.97 billion that was realized through

investments during the third quarter of 2022 was 35% lower than the target. The targets was not supported by sufficient regulatory changes, including delays in the stipulation of the New and Renewable Energy Bill and the Presidential regulation on renewable energy tariffs, resulting in a low rate of investment realization in renewable energy (IESR, 2023) reports that there was a general upward tendency on the demand side. The energy intensity is continuing its year-over-year decrease at a rate of 1.7%, which is in line with RUEN's aim of a 1% annual decrease (IESR, 2023)

However, because economic activity has begun to pick up again, the objective for the renewable energy mix in 2022 is only 12.2% lower than it was in 2021. Because of this, it is clear that the rate of energy transition has not been sped up to its full potential, and this presents an opportunity for businesses to establish a power rental business that continues to make use of diesel fuel. Moreover with 88.5% of Indonesia's energy mix reliant on fossil fuels (oil and gas at 50.5% and coal at 38%), renewables compete with subsidized fossil fuels, further undermining investor trust in renewable energy. This is necessary and can be a opportunity because there is still a significant amount of industry dependence on fossil fuels.

Indonesia has the highest electricity consumption in the ASEAN region, and the three largest cities in the country are on the island of Java, which represents 69% of national demand. This percentage is expected to remain stable despite the move of the national capital to Kalimantan, based on Figure IV.1.1, electricity consumption needs in general have continued to increase since 2011.

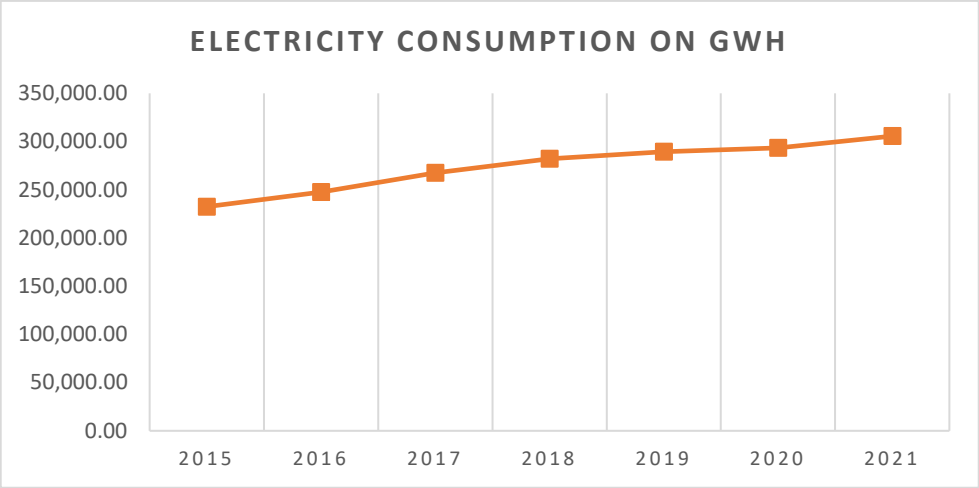

Figure IV.1. 2. Electricity Consumption
Sources: (MEMR,2021)

GDP growth will also indirectly affect conditions in the industry, an increase in GDP will lead to an increase in demand. Even though in 2019 Indonesia's GDP growth was affected by Covid 19 (figure IV.2), the amount of electricity consumption continued to increase.

GDP increased by 5.72% in 2022, which indicates that economic activity has returned to pre-pandemic levels. This was followed by an increase in primary energy demand and the proportion of fossil fuels in the energy supply; however, this will also result in an increase in the energy sector's greenhouse gas emissions. On the basis of this, it is clear that this presents an opportunity for the continuation of the business of power rental.

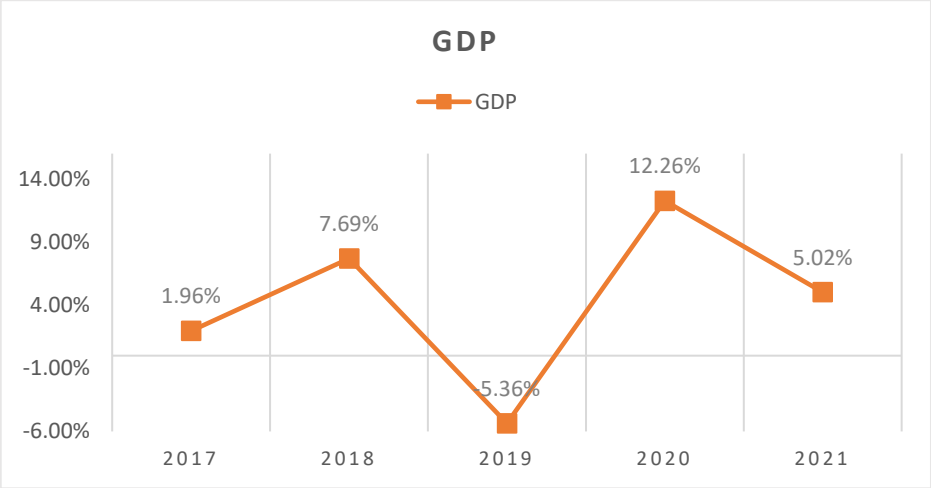

Figure IV.1. 3. GDP Growth
Sources: (Bank Indonesia, 2022)

There is a tangential relationship between an increase in a country's national income and an increase in the demand for electricity. On the other hand, global oil markets are affected by variables such as geopolitics, which are inconsistent with the current unpredictable pricing environment for energy. The fact that consumption of renewable energy will increase by 19% between 2011 and 2021 will more than make up for this discrepancy, demonstrating that renewable energy has the ability to accelerate economic growth.

Social

diesel is one of the most significant contributors to environmental pollution problems worldwide, and will remain so, with significant increases expected in vehicle population and vehicle miles traveled (VMT) causing ever-increasing global emissions. Not only environmental but also diesel emissions contribute to the development of cancer, cardiovascular and respiratory health effects. Exhausted from diesel engines has the potential to induce cancer induce lung cancer in humans and animals and may cause acute and chronic noncancer adverse respiratory health effects.

The most common cause of the effects of diesel use is lung cancer which has been found in more than 30 human epidemiologic studies (Bruske-Hohlfeld, et al., 1999). Population-based case-control studies identified statistically significant increases in lung cancer risk for heavy equipment operators. Diesel vapor contains genotoxic ingredients, which is capable of changing DNA and is believed to be a crucial biological cause of lung cancer. Based on the effect provided indirectly by the company but by the customer company, of course this can be a threat that endangers the environment close to the operational area.

The non-cancer effect of exhausted diesel has associated mortality and respiratory morbidity with exposure to ambient concentrations of ultrafine particles, raising concerns that diesel exhaust could contribute to or be the cause of the observed health effects. Several toxicology studies confirm that diesel exhaust induces inflammatory mediator production (Van Zijverden, et al., 2000) and airways hyperresponsiveness and tissue remodeling changes (Yamashita, et al., 2001) with exposures of up to several weeks. Based on the effect provided indirectly by the

company but by the customer company, of course this can be a threat that endangers the environment close to the operational area.

Occupational Health and Safety is also something that must be taken into account from a social perspective, in the industry it tends to use heavy equipment and may have high temperatures which have a high accident-prone level. By providing knowledge and also being equipped with tools for safety for employees, it will reduce the impact of work accidents in the industry. On the basis of this, this will be a threat to the organization since it will require the company to prioritize the safety of its employees and will be a reflection of the company when it comes to carrying out operational tasks.

The power temporary business is now seeing this market trend in developing countries, there is a growing need for services related to electricity rental: It is anticipated that the market for power leasing would expand in emerging countries as those countries engage in the construction of infrastructure and the modernization of their economies, which will increase the demand for temporary power solutions.

Technology

The policy to reduce emissions from primary energy in Indonesia gave birth to a technology based on carbon capture storage (CCS) which is used to reduce CO2 emissions, Carbon capture and storage (CCS) technology was developed to reduce CO2 emissions from primary energy. CCS in enquires a large CO2 supply, a good storage area, and the ability to meet financial and political criteria. This approach involves capturing CO2 from exhaust emission sources, transporting it to a storage region, and securing it (storage). This will be an opportunity for the company's business if it is able to apply it because it can reduce the environmental impact created.

The increasingly widespread use of digital technology, the use of the internet of things, including artificial intelligence and big data, has been carried out to facilitate operational activities, assist in decision making, effectiveness and efficiency in operations, and avoid fatalities. The use of digital technology has been applied in

the energy industry, but not all aspects of using it are still in the early stages of digital maturity.

Some of the uses of IoT in the field of diesel generators are using the IoT platform for monitoring and control of a diesel generator phone Application (App) to control actuators (Chandra, et al., 2017). Apart from that, there are also those who use a smart online system to monitor large scale generator engines. The work uses information technology to form the intelligent maintenance system. One component of the system acquires data for online monitoring while the other recommends action to be taken by the operator with regard to the type of malfunction which occurs (Maulidevi, et al., 2014). For the last load frequency control scheme for a hybrid generation system. The hybrid generation system consists of a wind turbine generator, diesel generator, aquaelectrolyzer, fuel cell and battery energy storage system so as to enable the smart grid concept resulting in the devices being interconnected and able to interact via the internet resulting in a ubiquitous energy control system (Pandey, et al., 2013). The energy industry is having issues with sustainability and efficiency; in order to address these issues, one way is by accelerating its digitization plan to increase resilience and keep investors interested.

The growing development of IoT is applied in industry so that in terms of technology it does not only discuss efficiency and optimization but also applications of IoT that are used in industry both in generator engines and big data analytics. This presents an opportunity for the organization to demonstrate that it has reached the level of digital transformation required if you are able to put it into practice.

Companies can become energy service providers by digitizing energy data. This new role has led to innovative business and customer-centric solutions, including assessing opportunities to offer services and deliver more sustainable electricity supplies. New customer needs and the change to a renewable-based decentralized and digitalized power paradigm require an integrated approach to offering new energy solutions and services. Energy-as-a-Service (EaaS) is a new business model in which provide many energy-related services instead of only electricity. ESPs can bundle energy consulting, asset installation, financing, and energy management

services for end users. Australia, China, Finland, Ireland, Italy, Japan, Sweden, the UK, and the US are adopting this concept (IRENA, 2019).

Energy as a service consists of energy advice that can assist consumers in formulating individualized energy strategies by using customer load data, electricity forecast, and historical data to optimizing their energy consumption. Second is energy asset installation that provide end-to-end services associated with the installation of on-site or off-site renewable energy projects and battery storage systems, such as engineering, procurement, and construction. The last is energy management that provide solutions through monitoring, remote control, and optimization of the load, without placing a burden on the customer. ESPs' revenue models vary based on the type of energy service provided. In addition to revenue models, client lifetime value is an essential measure that ESP considers when providing a service. This can be a new business model for companies that currently have a line of business in the field of service and energy consultation.

Another new business model development is Long duration energy storage (LDES) batteries, Long duration energy storage (LDES) batteries are a type of energy storage device designed to store huge quantities of energy for extended durations, often many hours to days. LDES batteries are utilized to promote the integration of renewable energy sources into the electric grid by storing excess energy produced during periods of low demand and releasing it during periods of high demand. They can also be utilized as backup power during blackouts same system like generator set model. Long Duration Energy Storage technologies (LDES) can play a crucial role in helping create the system flexibility and stability required by an increasing renewable share in power generation, alongside other technologies such as Lithiumion (Li-ion) batteries and hydrogen turbine (McKinsey&Company, 2021).

The battery itself is a flexible type based on the type of battery, if you use a lithium ion battery then it is usually used for renewable energy such as solar and wind. These batteries are rechargeable and can be used multiple times, why is a traditional lead acid battery such as lead and sulfuric acid battery typically not designed for long-term use in renewable energy systems.

This can be an opportunity for a new business model for the company as a step in the exit strategy of the power rental business if the demand has decreased significantly.

Environment

Diesel exhaust produces emissions that contribute to the production of ground-level ozone which can damage the environment such as pollution of air, water, soil and global climate change (Llyod & Thomas, 2015) .One of the effects that can occur is also the presence of food chain acid rain when exposed to the sea, property and reduced visibility. Diesel exhaust consists of hundreds of gas-phases, semi-volatile, and particle-phase organic compounds that are produced through the combustion of fossil fuels. Atmospheric deposition of air pollutants released from diesel exhaust to ecosystems and their components, such as forests, water bodies, and soils, is another significant source of contamination.

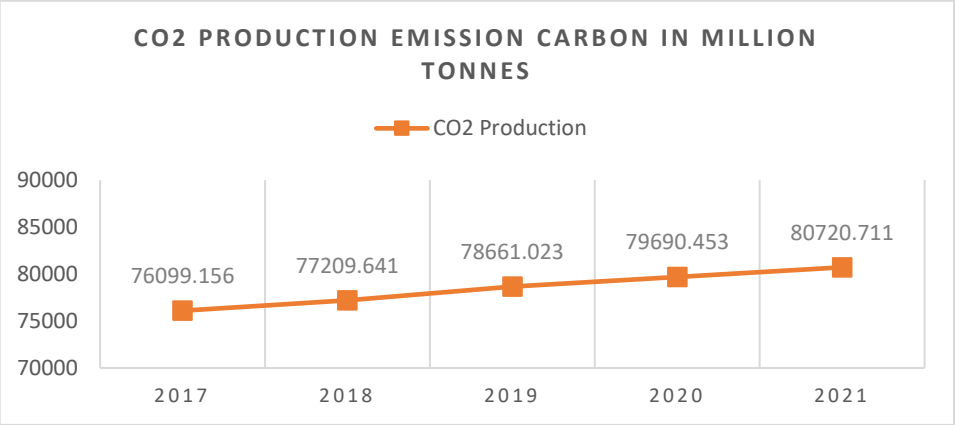

Figure IV.1. 4. Carbon Production Emission
Sources: (Our World in Data, 2022)

Climate change has become a global issue, even based on data from Our World Data, CO2 production in Indonesia continues to increase, therefore the government has prioritized zero emission net in 2060, so that the use of non-renewable energy which has side effects on the environment will be replaced with renewable energy. which is more environmentally friendly. Renewable energy resources certainly have an impact on the environment but not as big as fossil energy. Based on this, shifting towards renewable energy is one way to reduce environmental problems while still meeting human needs in the electricity sector. Based on this explanation, environmental issues will become a threat to the power rental industry in the future.

Following are the conclusions from the results of the external analysis which are summarized in the table below.

Table IV. 1.1. Summary Pestle Analysis

Politic & Legal	• RUPTL 2021-2030 • Installed Infrastructure • Ministry Energy and Mineral Resource Regulation No 12 / 2017	• RUEN / National Energy Plan • Harmonized Tax Regulations (HPP) Law on carbon tax and Presidential Regulation
Economic	• GDP • Investment in renewable energy	• Fluctuation fuel price • rate of energy transition has not been sped up
Social	• Occupational Health Safety	• Risks associated with diesel exhaust. • growing need for services related to electricity rental
Environment	• Carbon emission management	• Climate Change
Technology	• CCS • Hybrid generation system	• Data integration and IoT • Energy as a service business model • LDES Battery Storage

Porter Five Forces Model

To conduct this analysis, the author employs an evaluation based on variables included in Porter's five forces model. To determine the level of industrial attractiveness, determined by the highest number of each indicator.

Power of Buyer

Industry attractive or high forces indicate that consumer difficult to transit form one company to another and to cooperate with another company, industry not attractive indicate or low forces indicate that consumer have no difficulty to transit from one company to another company (Aliekperov, 2021).

Table IV. 1.2. Power of buyer analysis

Indicator	High	Mid	Low	Analysis
Number of Customer	✓			Both the non-utility sector and the utility sector provide a significant number of potential clients for this industry. This is due to the fact that power is an essential component for any kind of industrial activity. It is critical to have a reliable source of backup electricity, in particular for businesses that are extremely reliant on regular electrical supply.
size of each customer order		✓		In order to fulfill industrial objectives, it is typical to require significant quantities of electricity; hence, a single purchase will typically be issued for enormous proportions (especially for the utility sector).
differences between competitor	✓			The engine technology, fuel type, level of efficiency produced, and bundling packages that are offered are the primary differentiating factors.
price sensitivity	✓			Price competitiveness is quite strong in this sector primarily due to the fact that the primary differentiator between competing products is the level of performance offered by the respective machines.
switching cost		✓		Because the items that are sold are not very dissimilar from one another, the industry in question has relatively low switching costs.

The results of the power of buyers analysis show high forces indicating that it is difficult for consumers to switch to another company.

Power of Supplier

Industry attractive or high forces indicate that enough alternative supplier present on market, industry not attractive or low forces indicate that difficult for company to find alternative for current supplier (Aliekperov, 2021).

Table IV. 1.3. Power of supplier analysis

Indicator	High	Mid	Low	Analysis
number and size of supplier			✓	There are few vendors accessible for this business, particularly for spare parts for power generating. Typically, a company has signed a contract with a supplier to fulfill its asset requirements.
uniqueness of each supplier product		✓		The technological component is what differentiates one generator from another in this industry; the distinctive characteristics of each provider are not particularly showy
focal company ability to substitute		✓		is the capacity of a corporation to carry out a process in its entirety, from beginning to conclusion. In point of fact, very few businesses operating in this sector are capable of doing it.

The results of the analysis above show low forces which indicate the minimum number of existing suppliers and with the previous contract system will make the level of competition between suppliers a little limited.

Threat of Substitutes

Industry attractive or high forces indicate its hard for customer to find an alternative for offered product or services, industry not attractive or low forces indicate that customer easily find an alternative for offered product (Aliekperov, 2021).

Table IV. 1.4. Threat of substitutes analysis

Indicator	High	Mid	Low	Analysis
number of substitute product			✓	There are not an excessively large number of businesses that provide options and services related to power. Therefore, it will be challenging for customers to select the type of product or substitute goods they want.

perceived level of product differentiation		✓		consumers are able to replace the things they want even while the products offered by competitors do not differ much in terms of product differentiation. However, one of the important determinants of success in this sector is a brand's reputation, which reflects the overall quality of its wares.
buyer propensity to substitute		✓		The characteristics of an item's quality and efficiency have an impact on the likelihood of a buyer making a purchase.

The results of this analysis show low forces which indicate there is no big difference from each company in this industry, only the trust factor of a brand can influence consumer decisions.

Threat of New Entrants

Industry attractive or high forces indicate that difficult for potential competitor to enter market, industry not attractive or low forces indicate that easy fort potential competitor to enter market (Aliekperov, 2021).

Table IV. 1.5. Threat of New Entrants Analysis

Indicator	High	Mid	Low	Analysis
Capital Requirement	✓			The resources needed for the power rental industry are quite large, not only for product availability but for operations and also the area coverage must also be taken into account. It will be difficult for newcomers who don't have to compete in this industry
Brand Loyalty	✓			Typically, significant quantities of electricity are required to suit industrial needs, therefore one purchase is placed for enormous proportions (especially for the utility sector).
Government Policies	✓			this industry is highly regulated. legality, permits, safety, standard equipment, financial regulations, and environmental factors that will make it difficult to enter this industry
Cumulative Experience	✓			Experience is required in this business, which will damage client confidence, because the cost of completing a project is significant and it will be very difficult for new companies to compete in this industry.
Access to distribution channel		✓		Having access to all of Indonesia's islands will expedite the distribution of goods to clients, a benefit that is not shared by other competitors.

The results of the analysis show high forces which indicate an attractive industry because it will be very difficult for potential competitors to compete in this industry.

Rivalry among existing competitors

Industry attractive or high forces indicate that there are a not great number companies on the market, industry not attractive or low forces indicate that there are a great number of companies on the market in the state of competitive rivalry (Aliekperov, 2021).

Table IV. 1.6. Rivalry Among Competitors analysis

Indicator	High	Mid	Low	Analysis
Number of Competitors	✓			Competitors in the industry are diverse and currently there are many companies that have special subsidiaries to meet their power solution needs
Diversity in Competitors		✓		its competitors do not have different diversity except for the type of technology & product efficiency offered.
Quality Differences	✓			Each company's ability to attract customers depends on the quality of its offerings. Due to the fact that there is no significant distinction between the product types.
Industry Growth	✓			If renewable energy is successfully implemented, the power rental industry will experience growth. The government's 35,000 MW program can potentially contribute to the expansion of this business especially in renewable energy sector.
Brand Loyalty		✓		Because this industry has high economies of scale in terms of transactions, operations, and capital requirements, brand loyalty is very important. Brands that have experience and high professionalism are the main reasons.

The results of the analysis show high forces indicating high rivalry among competitors because not many companies can compete in this industry.

Table IV. 7. Summary porter analysis

Power of Buyer	Power of Supplier	Threat of Substitutes	Threat of New Entrants	Rivalry among existing competitors
High Forces	High Forces	Low forces	Low forces	High Forces

IV.1.2 Internal Analysis

IV.1.2.1 Resources Analysis

Tangible resources

• Existing Asset

Having a long operating time causes the number of varieties of electrical products offered is quite large, consisting of: power generation rental, rapid power generation, medium & long term power generation, power barge, back up, peak load, and base load usage with a total machine generators more than four hundred pieces.

• Sales distribution channel

Two of the company's subsidiaries contribute to the holding company and its subsidiaries' ability to operate a successful, integrated business by rounding out the variety of products and services provided and working together with other group members. Due to its subsidiaries' involvement in geothermal and renewable energy, SM Company is leading the way in the creation of long-term electricity solutions. This has been made possible by numerous advances in the creation of new and renewable energy.

Intangible Resources

• Organization Culture

In the process of developing a plan that is carried out in line with the firm's values, namely: transparency, accountability, responsibility, independence, fairness, and equality, the company is able to achieve good corporate governance (GCG). The business also considers the concept of checks and balances, which aims to keep the business sustainable over the long term, as well as the structure of corporate governance, which is carried out in accordance with legal requirements based on the idea of performing tasks, duties, and responsibilities for the benefit of the business.

• Brand Value

The company has been operating for more than 25 years and has the main core business of power rental, this length of time is accompanied by many projects and partners who work together during this period as well as operational areas throughout the archipelago. The company has a brand as a provider of electrical solutions.

• Operational System

In carrying out operational activities, the company applies the principles of sustainability and sustainability in operational activities such as the application of passive designs, modular, and repeating prefab systems with the aim of minimizing the negative impact of operational activities and electricity maintenance on the environment.

- Client relationship

cooperation with complementary parties or businesses both domestically (private and BUMN/BUMD) and internationally with the goal of growing the network to take advantage of more project opportunities, including tenders and other opportunities, such as power plants, with an emphasis on marketing and the application of the business's operations and maintenance capabilities to the projects.

- Expert Engineering

The company employs coal-fired power plant, gas turbine, and dewatering pump operators that are highly qualified and have years of expertise in their respective fields. This is reinforced by the existence of other business lines in this company, one of which is called operation & maintenance. This business line provides operation, repair, and maintenance services of electricity assets with high quality standards, and its primary goal is to ensure the dependability and effectiveness of its customers' electrical assets.

- Entrepreneur Propensity of Innovation

According to the entrepreneurial perspective, one of the most important structural characteristics of an economic system is its ability to generate various entrepreneurial opportunity links, regardless of the knowledge of individuals to perceive and capitalize on these opportunities (Radosevic & Yoruk, 2013). This idea is put into practice by the company through the utilization of its assets in the development of many business lines to expand the diversification of the company's business model, which is not limited to the power rental business model alone.

- Diversification Product

The power rental business, which is the company's main core, only consists of diesel-fueled power rental, which is the company's primary income with the buyer factor being dominated by the utility sector. However, currently in the midst of an energy transition to renewable energy, diesel fuel has begun to be reduced and the demand for power rental businesses in companies will decrease.

IV.1.2.2 Core Competencies

The VRIO model analysis serves as a method for identifying the core competencies held by SM Company, and it reaches a favourable verdict regarding these core skills.

Table IV.1. 8. Summary of Resource & competencies analysis

Resource	Valuable	Rare	Costly to Imitate	Organize to capture value	Competitive Advantage
Existing Asset Power Generations	☑	☑			Parity
Sales Distribution Channel	☑	☑	☑		Temporary
Organization Culture	☑	☑	☑		Temporary
Brand Value	☑	☑	☑	☑	Temporary
Operational	☑	☑	☑	☑	Sustainable
Client Relationship	☑	☑	☑	☑	Sustainable
Entrepreneur Propensity of Innovation	☑	☑	☑	☑	Sustainable
Diversification Product	☑				Parity

Based on the results of the internal analysis, resources consisting of sales distribution channels, organizational culture, brand values, operations, client relationships, and entrepreneur propensity of innovation can become the company's strengths, but the quality must be maintained. Meanwhile, resources consisting of existing power assets and product diversification are the company's weakness that can hinder the pace of business growth in the future.

IV.1.3 Scenario Planning Analysis

The scenario creation stage consists of orientation, exploration, and scenario creation, while the strategy development stage consists of option consideration and integration.

IV. 1.3.1 Orientation

The focal issues for The Company based on data collection and discussion is concluded in main questions as

- how is the impact of power rental business to SM company in 5 years amidst the energy transition process to renewable energy?

The key focal issue will be the base of exploration during the collection data stage with pre-determined questions to develop the scenario planning of the company with all implications and options they may have in the period of the next 5 years. The time horizon for scenarios must be short enough to create scenarios that are probable, but long enough for us to imagine that important changes with an impact on the future business can take place.

IV.1.3. 2 Exploration

Based on the outcomes of data gathering from the business environment analysis conducted in the preceding subchapter, both internally and externally, numerous aspects that become threats and opportunities are selected as driving factors that can impact future company continuity. It is composed of:

- Government Support & Policy

There are a number of plans and policies that have been developed by the government that can have an effect on business. One such policy, which is mentioned in RPTUL 2021-2030 and RUEN, is a policy to decrease the use of diesel and place more of an emphasis on the use of fuels that are derived from renewable energy. In this perspective, political stability is also mentioned, given that it is vitally crucial for private firms to have stable environments. It produces an ecosystem that is steady and predictable, which is beneficial for business investment and operation. Businesses will be able to confidently plan and invest in

their operations since it guarantees that the laws and regulations connected to the power industry will stay consistent throughout time. If there isn't political stability, businesses might have to deal with unpredictability and risk, both of which might hinder their capacity to function in an effective and efficient manner.

- Indonesian Economic Growth

The cost of business operations can also be influenced by a variety of economic factors, including inflation, interest rates, and currency rates. In addition, the state of the nation's economy as a whole has the potential to influence both the level of demand for power rental services and the extent to which customers are able to pay for them. If the economy is doing well, there may be a rise in demand for power leasing services. On the other hand, if the economy is doing poorly, there may be a fall in demand. Consider the instance when Covid 19 struck nearly every industry in the world, including the power rental industry. The volatility of oil prices can also have an effect on economic conditions; if prices continue to rise, there will be little choice but to adapt alternative energy fuels and transition to renewable energy.

- The Pace of Energy Transition

The pace of energy transition is influenced by factors such as the cost of renewable energy, which can compete or is cheaper than the cost of fossil fuels, and increased investment in the renewable energy sector. It's important for power rental diesel generator businesses to stay informed and adapt to the changing energy landscape in order to remain competitive and profitable.

- Technology Advancement

The ability of technological developments in the power industry will affect the progress of the industry. The more advanced technology will produce product innovations that are abundant and able to be utilized by companies. Both technological advances in terms of intact assets and technology that can be installed into an asset. The generation, storage, and distribution of energy are all becoming less difficult and more economically viable because of advances in technology. This is pushing businesses in the power rental industry to investigate emerging

technologies and potential solutions for energy storage in order to boost the effectiveness and dependability of their operations.

- Environmental Impact

The problem that is being faced by almost the whole world today is climate change, environment is something that the government pays attention to. The demand for all industries is to establish a "green" company so that it will not be detrimental in the future.

- Digital Transformation

Implementing digital transformation will facilitate several aspects within the organization, such as more efficient operations with predictive maintenance and business analysts who make it easier to make decision making. Digital information can be easily backed up and secured with the use of encryption and other security protocols, which can help in increased security, and accessibility which can make it easier for customers to find the equipment they need and make reservations. This can help to increase the number of customers and rentals for the business.

- Market Price

The power rental business has competitive prices with its competitors because the only difference is in the technology and the amount of fuel used. Understanding the prices of competitors can help the business to price its equipment competitively and increase its market share.

- Employe capability

Safety is a major factor in the power rental business. Having skilled and certified employees is necessary but discipline in following and implementing the safety regulations, industry standards and environmental laws. This helps the company to comply with legal requirements and avoid any penalties.

- Business development capability

Having the ability to develop a business is also an important factor considering that an industry that moves dynamically requires adaptive and sensitive characteristics

to the turmoil that occurs in the business. Innovation, growth and long-term sustainability can be produced if you have capable business development.

Based on the results of data analysis using the method described in chapter 3.3, the following are the results of the uncertainty analysis.

Table IV. 1.9. Uncertainty analysis

Driving Forces	Level of Uncertainty	Level of Impact
Government Support or Policy	8.4	8.4
Indonesia Economic Condition	7.8	8
Technology advancement	8.2	8
Environmental Impact	7.4	7.8
Pace of Energy Transition	7.4	7.2
Digital Transformation	5.2	5.4
Market price	7.6	4
Employe capability	6.8	4.2
Business development capability	6.2	5.6

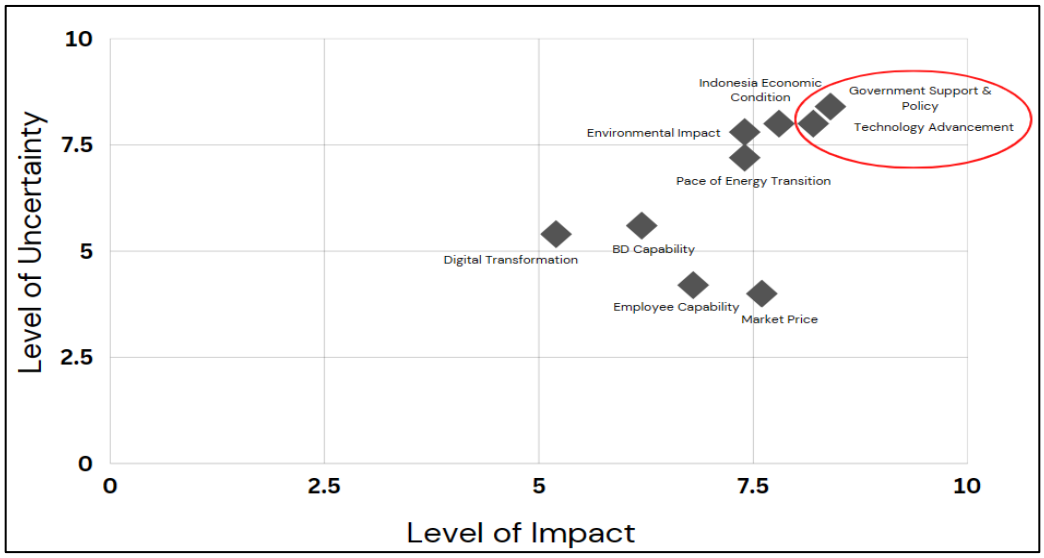

Figure IV.1. 5. cross plot diagram for uncertainty analysis
Source: Author analysis

After that, plotting is carried out based on the results above into the scatter plot graph and the red circle shows the two highest factors which will be analyzed in the next stage, namely development scenario planning.

IV.2 Business Solution

IV.2.1 Scenario Creation

The building of a scenario framework is the next phase, and it will be based on the outcomes of the analysis of the data that was collected previously. The process of building a scenario matrix is considered to be part of the scenario generation stage, which also includes the stage for designing scenarios. Scenarios don't always correspond to ideal or unpleasant futures, "good" or "bad" realities. It can also be both painfully great and fantastically horrible. The possibilities are reasonable hypotheses for how the world might develop in the future. It is intended to emphasize the dangers and possibilities that businesses will encounter in each of the situations.

The driving forces that have the highest degree of uncertainty and level of impact are Government support & policy and technology advancement. Government support & policy are factors that affect the sustainability of the business, the market utility sector has a very large impact on this but will also have an impact on the non-utility sector. Several policies will make the industry change in accordance with the policy directives made, in this case the main stakeholder of the power rental industry is PLN as the holding company in electricity which regulates the needs of the Indonesian people in terms of meeting power needs. Policy is influenced by several factors such as the pace of transition from energy to fuels that use renewable energy will also affect policies made by stakeholders in the electricity industry, the national energy plan will also affect policies made that can reduce the company's market.

In this instance, technological advancement has a significant impact on the company's operations. Particularly in the context of the impending energy transition, technology pertaining to fuels from renewable sources will have a significant impact on economic conditions. A firm's ability to compete in its industry is demonstrated by the diversity of its business lines or goods, which are able to endure amid the rapid changes of industry. The development of technology will result in creative products and will demonstrate how adaptable a company is. The primary criterion in this situation is whether there is a power generator that can

compete with diesel generators. The scenario matrix depicted in the picture below incorporates the outcomes of the two most important components above, see at figure IV.2.1.

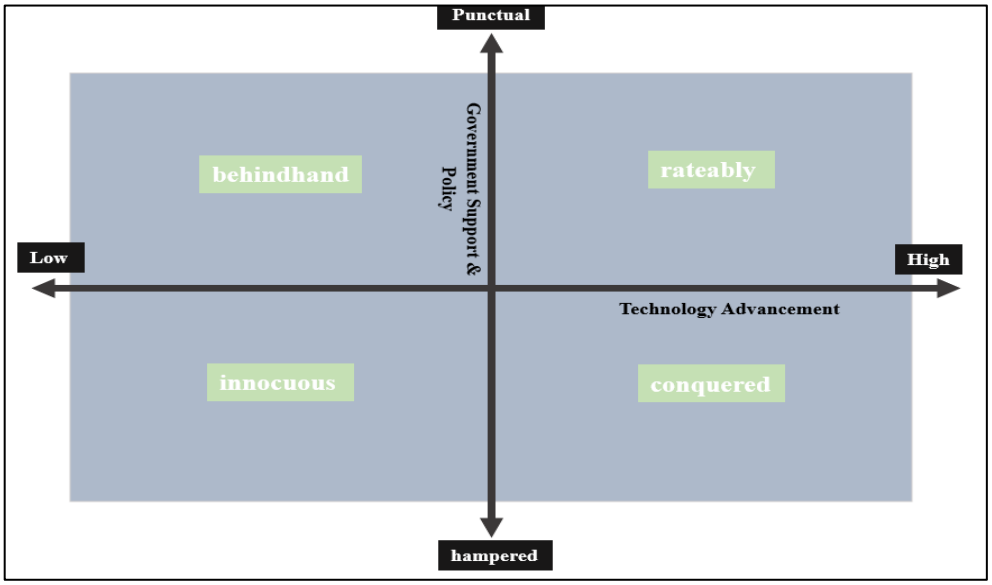

Figure IV.2. 1. Scenario Framework analysis
Sources: author analysis

Condition 1 as innocuous

It should be anticipated that the government support and policy that is designed to experience disruption will continue to operate, albeit at a relatively slow rate, so that plans will not be carried out as intended and that technological advancement will remain the same as it is today, with neither companies nor industries have found a technology that can replace diesel generators.

Condition 2 as behindhand

The corporation has not been able to discover an alternative for diesel generators in the event that government support and policy are implemented on time with a rate of energy transition that is consistent with government goals and objectives, but the technological improvement has not occurred.

Condition 3 as conquered

The scenario in which government support and policy for disruption continue but at a relatively slow rate, so that the plan does not go according to the government's plan, but technological advancement occurs and products capable of replacing

diesel generators are discovered, allowing product-owned companies to innovate by implementing renewable energy into their products, should be anticipated.

Condition 4 as rateably

It should be anticipated that government support and policy will be implemented on time and in accordance with the government's plan, and that technological advancements will have led to the discovery of products that can replace diesel generators, allowing companies to incorporate renewable energy into their product innovations.

Following the formation of the scenario framework as mentioned above, the next stage is to develop the scenario narratives for each scenario.

IV.2.2 Scenario Narratives

Innocuous

Jakarta Post 2028. Indonesia finnaly reach green energy mix 23% at 2028. In this scenario, the government's aim of obtaining a 23% renewable energy mix by 2025 has not been realized, followed by a high demand for the use of fossil fuels, resulting in a rather delayed energy transition process. Due to disturbances in overstock, which delayed the emphasis on PLTD conversion work, the RPTUL program's policies were not implemented according to schedule. As a result of the prioritizing of priorities, the infrastructure is not prepared to meet the procurement of renewable energy, causing the planning of all plans to exceed the projected time/delays. Consequently, infrastructure is still not ideal, investment growth in the renewable energy industry is still low, and tangible progress has not yet been made because investing in the renewable energy sector requires very high prices and support in the form of renewable energy legislation and policies. On the firm side, product innovation is slow, followed by companies that have not found a solution to the transition to renewable energy technology; leased assets continue to utilize fossil fuels because demand is still high.

Behindhand

Jakarta Post 2028, achieving a 30% renewable energy mix by 2030 is not impossible! The increasing rate of economic growth, the high number of investors in the renewable energy sector, and the PLtD conversion program, which is about 80 percent complete at the installation stage, are not accompanied by technological progress. In this scenario, the government's goal of attaining a renewable energy mix is reached and executed, followed by RPTUL obtained by decreasing the use of PLTD in Indonesia, the dedieselization program is implemented on schedule, and diesel demand has dropped. In terms of the energy transition, Indonesia's development is swift and dependent on the use of renewable energy, which comprises a greater proportion. Investment in the renewable energy sector is already underway due to the government's focus on creating infrastructure to satisfy the needs of renewable energy. Despite technological development and product innovation, businesses are still unable to employ renewable energy to power their assets and continue to rely on diesel fuel. The corporation cannot keep up with the current rate of energy transition, and several of its rivals have already begun using renewable energy in their products..

Conquered

Jakarta Post 2028, the result of join venture with a foreign company, SM Company succes provide renewable generator. In this scenario, the rate at which the transition from traditional energy sources to renewable energy sources is typically slow, and the demand for fossil fuels is also still high or has not been able to successfully shift to renewable energy. As a consequence of these two factors, the development of the industry from the investment side and the supply infrastructure is also not ready, which means that investment in the renewable energy power sector is also still minimally planned, which causes the entire plan to take longer than anticipated or be delayed. The company is able to convert its assets from fossil fuels to renewable energy and has begun to gradually abandon fossil energy. The company also produces new products that are related to renewable energy and is able to adapt to the rapid pace of energy transition before policy makers are ready for it.

Rateably

Jakarta Post 2028, Indonesia is on track to meet its renewable energy objective in 2030 with a positive index. In this scenario, the energy development strategy connected to the renewable energy mix has been successfully accomplished, and PLN has successfully executed the RPTUL program, which has resulted in a lower usage of power generated by fossil fuels. The country of Indonesia is making strides toward a more sustainable energy future at a breakneck pace. The focus of the government, which is already under way, is on constructing infrastructure to meet the needs linked to renewable energy. As a result, technological advancements and investments in the renewable energy sector are already under way. The advancement of technology is quite significant, and a number of technologies that can compete with generators powered by power diesel have already been launched. These technologies aim to replace power diesel. Alongside the proliferation of new product ideas, there has been a concurrent decline in the demand for fossil fuels.

IV.2.3 Option Consideration

Following are the results of the implications and options made based on the scenario creation described in the previous sub-chapter.

Innnocuous scenario (hampered government support & policy, low technology advancement)

Implications	Options
- The RPTUL program and the National energy strategy have not been fully implemented/delayed..	- Focus on the company's current strategy to balance the company's portfolio through services
- Transitioning slowly to renewable energy still necessitates fossil fuels.	- Increase the non-unity market for the power rental business
- Increasing fossil fuel demand	- Cost leadership strategy
- Carbon emmision increase	- Improving generator technology to enhance efficiency and reduce emissions.
- Product innovation does not occur in the company. As a result, it continues to rely on diesel-powered assets.	

- There is no technology that can surpass the dependability of a diesel generator.	- Analysing and preparing for renewable energy projects, LDES batteries. - Initiate a new project business model for energy as service as the company's main focus going forward

Behindhand (punctual government support&policy, low technology advancement)

Implications	Options
- Both the national energy plan and the RPTUL program have been successfully implemented. - The transition to renewable energy is gaining momentum, and the demand for traditional forms of energy is sliding. - Carbon emmision decrease - create new opportunities for investment in Renewable Energy Technology - Infrastructure for renewable energy supported by the government - Product development has been sluggish, and there is no alternative to the dependability of a diesel power generator.	- Improving market penetration on non utility market, Open new market segmentation. - Cost leadership strategy - Product innovation strategy installing equipment for renewable energy fuel in generator set or using gas engine - Importing technology from other countries - Trying to colaborative project about renewable energy on product - Conducting research development for the creation of new business models for renewable energy in the services industry - Initiate a new project business model for energy as service as the company's main focus going forward

Conquered scenario (hampered government support & policy, high technology advancement)

Implications	Options
- Regulations continue to emphasize fossil fuels	- Current corporate assets can survive as long as diesel power is required. - Diferentiation strategy

- The RPTUL program and the National energy strategy have not been fully implemented/delayed . - Insufficient renewable energy investment - The gradual transition to renewable energy is dependent on fossil fuels. - Carbon emmision increasing - Technological progress occurs within the organization. - Product innovation occurs, and alternatives to the dependability of diesel generators are discovered.	- Improving market penetration on non utility market - Trying to make an colaboration with renewable energy project - Long term plan oriented initiated diversification business model on product about renewable energy - Analysing and preparing for renewable energy projects, such as LDES batteries

Rateably scenario (punctual government support & policy, high technology advancement)

Implications	Options
- Both the national energy plan and the RPTUL program have been successfully implemented. - The transition to renewable energy is gaining momentum, and the demand for traditional forms of energy is sliding - Government support for renewable energy infrastructure - Create potential new entrants, competition will be tight - Increasing air quality due to greener power generation - Technological progress occurs within the organization. - Product innovation occurs, and alternatives to the dependability of diesel generators are discovered	- Differentiation strategy - Add new business model energy as a services - Already converting diesel generator to biogas or biofuel - Shifting to renewable asset - Long term plant oriented trying to make significant investment on long distributed energy system batteries - Long term plan oriented trying make significant investment on energy as service on renewable sector

IV.2.4 Integration Early Warning Signals

This research provides early warning signs for the SM Company strategy & governance team and top management to consider in business orientation decisions. Early warning indicators for the concerns highlighted include: policy, technology, energy transition, economic, regulation, and environment. It is strongly recommended that early warning signals be scanned regularly, at least once a year, to ensure that any possible threats are identified and dealt with promptly.

Table IV.2. 1. Early warning signals for innocuous scenario

	Measure	**Signals**
		Innocuous
Policy	RUPTL & National Energy Development plan	below expectations
	Program 35,000 MW	still not fulfil the target
	installed capacity for Renewable Energy Power	below than 30%
	installed capacity for non-Renewable Energy Power	more than 70%
Technology	Power Generation Technology	Diesel generators have not been replaced.
Energy Transition	Energy Mix	below than 23%
	renewable energy consumption	below than 5.77%
	renewable energy generation	growth below than 8.86%
Economic	Economic Growth	decrease
	Investment in RNE	low
Regulation	Renewable Energy Policy	regulations remain the same.
Environment	Carbon Emission	increase

Table IV.2. 2. Early warning signals for behindhand scenario

Indicator	Measure	Signals
		behindhand
Policy	RUPTL & National Energy Development Plan	exceed expectations
	Program 35,000 MW	fulfill the target
	installed capacity for Renewable Energy Power	more than 30%
	installed capacity for non-Renewable Energy Power	below 50%
Technology	Power Generation Technology	Diesel generators can be phased out in favor of renewable energy sources.
Energy Transition	Energy Mix	more than 23%
	renewable energy consumption	more than 5.77%
	renewable energy generation	growth of more than 8.86%
Economic	Economic Growth	increase
	Investment in RNE	high
Regulation	Renewable Energy Policy	Regulation framework investment & incentives for private sector
Environment	Carbon Emission	decrease

Table IV.2. 3. Early Warning Signals for conquered scenario

Indicator	Measure	Signals
		Conquered
Policy	RUPTL & National Energy Development Plan	below expectations
	Program 35,000 MW	still not fulfill the target
	installed capacity for Renewable Energy Power	below 30%
	installed capacity for non-Renewable Energy Power	more than 70%
Technology	Power Generation Technology	Diesel generators have not been replaced
Energy Transition	Energy Mix	below 23%
	renewable energy consumption	below 5.77%
	renewable energy generation	growth below 8.86%
Economic	Economic Growth	decrease
	Investment in RNE	low
Regulation	Renewable Energy Policy	regulations remain the same.
Environment	Carbon Emission	increase

Table IV.2. 4. Early warning signals for rateably scenario

Indicator	Measure	Signals rateably
Policy	RUPTL & National Energy Development Plan	exceed expectations
	Program 35,000 MW	fulfill the target
	installed capacity for Renewable Energy Power	more than 30%
	installed capacity for non-Renewable Energy Power	below 50%
Technology	Power Generation Technology	Diesel generators can be phased out in favor of renewable energy sources
Energy Transition	Energy Mix	more than 23%
	renewable energy consumption	higher than 5.77%
	renewable energy generation	growth of more than 8.86%
Economic	Economic Growth	increase
	Investment in RNE	high
Regulation	Renewable Energy Policy	Regulation framework investment & incentives for private sector
Environment	Carbon Emission	decrease

Trends Power rental industry

Based on the results of scenario planning analysis, the factor with the most driving forces is government support, which is caused by several factors including energy development plans, environmental issues, political stability, and economic conditions in Indonesia, and the factor with the second most driving forces is technological advancement, which is controlled by investment in renewable energy, market demand, business development capability, and competition among competitors.

For non-utility markets, such as non-government, manufacturing, mining, oil & gas, healthcare, the development of new national capitals, and data centers continue to demand diesel generators. It is expected that the market utility that sells its goods to the government will continue to endure a reduction due to the decreased use of PLTD and increased emphasis on renewable energy.

The advantages of diesel generator sets are that they do not require large areas of land and do not require a lengthy starting phase, they can produce a high amount of

power in a relatively small package, making them suitable for a variety of applications, and they are reliable because they are a common way to provide electricity in areas where the grid is not yet available.

The development of government policy towards the use of renewable energy cannot be said to be positive either. Economic factors also play an important role in the success of a policy. New renewable energy generating capacity has increased by 1,730 MW with an average annual growth of 4.3%. The installed capacity of new, renewable energy power plants in 2021 came at 654.76 MW out of the target of 854.78 MW (IRENA, 2022).The investment structure to encourage greater private engagement in renewable energy investment, Indonesia must modify its investment environment. In addition, the excessive prices provide a substantial barrier.

Regulation is also a factor in the development of this renewable energy transition; when regulations support renewable energy, investment in the renewable energy industry will increase, and if that occurs, so will the technological development of renewable energy, resulting in an expansion of the renewable energy market sector. Several renewable energy projects have been delayed as a result of the current rules, which include technical risk, environmental planning, fossil fuel subsidies, and insufficient investment due to the significant risk of investing in the business. Countries that have maximized their use of renewable energy, such as China, provide regulations in the form of financial sector incentives, such as tax incentives (corporate income and import taxes), low interest loans to reduce financing costs for private sector developers, and subsidies for R&D and installation of renewable projects. The attractiveness of renewable energy projects has also become RE developers' concern. According to RE developers survey, three main financial supports are needed by developers, namely (Feed in Tariffs) FiT, fiscal incentives, and soft loan (IESR, 2023).

The oversupply problem that stakeholders are currently experiencing cannot be understated. According to the data, oversupply has existed since 2013, and this will increase the financial burden on PLN, which will have a number of repercussions, including decreased revenue and costs for the maintenance of idle power plants, reduce investment in new power plants, and difficult to meet energy target mix.

When this occurs, the rate of energy transition will slow, resulting in a continued need for diesel generator power. Based on past events for several years PLN was not able to fulfil its capacity expansion plans, the reasons being excessive capacity addition plans due to unrealistic load growth forecasts and unforeseen delays in grid capacity investment (IRENA, 2022). But that doesn't mean it's pessimistic, possibilities for other possibilities exist, so it's based on that assumption that the scenario in sub-chapter 4.2 was created.

Taking into account recent events, that a several of fossil fuel companies, both state-owned and privately held, that are listed on the Indonesia Stock Exchange (IDX), have begun to diversify their company towards low-carbon industries. Some have established their net zero emissions targets, made steps to minimize GHG emissions from their primary activities, and intend to add more renewable energy developments to their portfolio of commercial ventures. (IESR, 2023).

According to the industrial life cycle, the power rental industry is currently in the maturity period (the gray square). At the period of market maturity, demand from any further market is minimal. The majority of current demand comes from either replacements or subsequent acquisitions. The market has reached its maximum size, and going forward, it is anticipated that the growth rate of the industry will be either nil or even negative (Rothaermel, 2021). Market demand has dropped, increasing corporate competitiveness. In the maturity stage, when companies are trying to decrease costs, process innovation peaks while incremental product innovation drops.

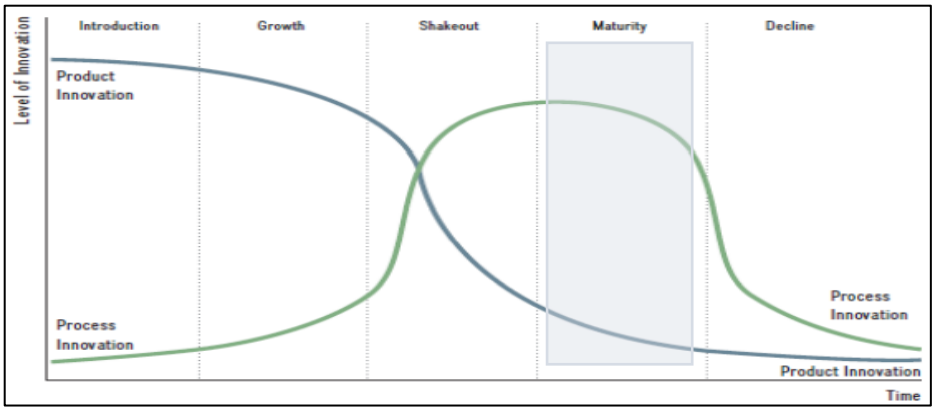

Figure IV.2. 2. life cycle industry analysis
Sources: edited from (Rothaermel, 2021))

According to the graph in figure IV.2.2, the priority should be placed on process innovation rather than product innovation. Process innovations are new ways to produce existing products or to deliver existing services (Rothaermel, 2021). In this instance, process innovation is optimizing the current assets, need installation new or extra devices on the assets or develop a new business model with the current assets.

On this basis, the responsiveness and preparedness of the firm's plan must be evaluated, and it is intended that the early warning signals would support the organization in determining the optimal decision-making strategy. The power rental business model for short-term can still be maintained, but not for long-term plants. For this case, the primary issue is the company's product diversification; limited product or business types impede the organization's flexibility; a new business model must be developed based on evidence; and the author's approach to making proposed strategies is discussed further in subchapter 4.3, namely selecting a strategy and proposing a new business model that resembles the company's current business but with a focus on renewable energy

IV.3 Implementation Plan

IV.3.1 Implementation Process

The power rental industry is subject to a multitude of external factors, each of which can have a significant and unpredictable impact on the industry as a whole. The challenge for businesses is to analyze these aspects in order to generate future possibilities that are in line with the strategy of the company. The significance of understanding the current state of the market and making plans to compete with other businesses. The following is an outline of the stages of process implementation that can be carried out after designing scenarios as a method for responding with unpredictability. These steps include:

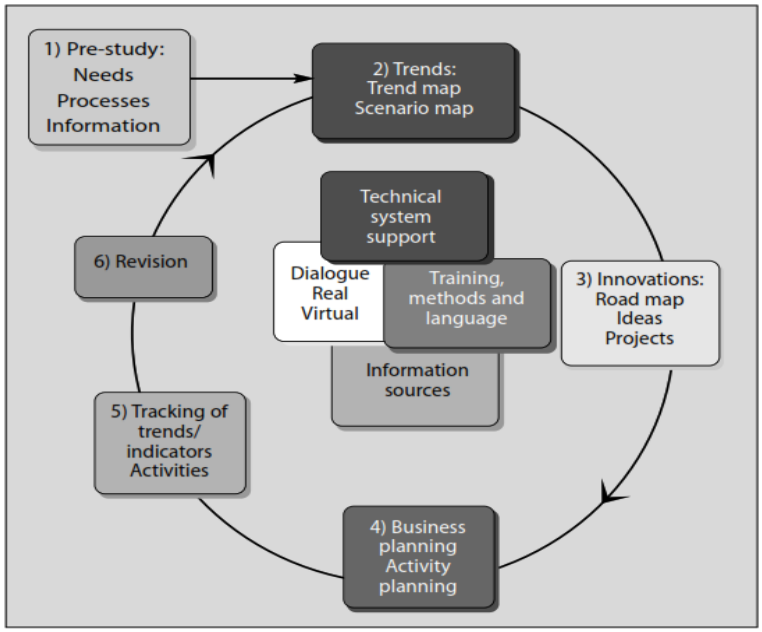

Figure IV.3. 1. Trim Process
Sources: (Lindgren & Bandhold , 2009)

Success factor in scenario planning is clear understanding of the business context, trends and uncertainties key to success, especially in more turbulent business environments. that a continuous and integrated approach to business environment analysis is most effective (Lindgren & Bandholds, 2009). At this step in the implementation process, the TRIM process scheme is carried out based on these considerations.

Based on that stage, after the scenario was made, the next step is innovation roadmap ideas. In this case, there was a discussion about aligning the corporate strategy roadmap with the proposed scenario, the author also makes suggestions about the strategy that was used (in chapter 3.2 implementation plan). The next step is business planning activity that chosen by company.

In the stage tracking indicators, an evaluation is done during the time strategy roadmaps are made. In the stage of analyzing and developing options, an evaluation is done to make changes to the indicators in the early warning signals. This will produce implications and new options for more accurate results due to the nature of this industry. In the revision stage, if managers or top management receive unfavorable performance feedback or if the external environment undergoes a shift, they must decide whether to make additional adjustments to the dominant strategic

plan in order to improve the performance of the company or whether to implement an alternative strategic plan.

IV.3.2 Implementation Plan

Strategic imperatives are frequently produced as part of a company's overall strategic plan and are intended to provide the business with a clear path to follow, and its preparation is included in the strategic roadmap. The strategic roadmap is a visual representation of the organization's long-term goals and objectives, as well as particular actions with main factors, including long-term goals, strategic imperatives, and a timeframe. The planning is based on the four alternative scenarios stated in the preceding chapter.

Due to their lack of product diversification and the obstacles posed by the energy transition, the strategy outlined in their most recent annual report is to balance the company's business unit portfolio. The company's future plan is to innovate both its products and services in the direction of renewable energy. The technique for identifying strategy imperatives employs the WUS framework, which addresses the three aspects (Want, Utilize and Should).

Based on this statement, the authors try to carry out an alignment with the scenarios that are made and make several additional proposed strategies:

1. Maintain strategy by providing ongoing help on marketing issues to optimize presently owned assets by expanding market penetration in non-utility sectors such as the oil and gas industry or mining sector. Monitoring customer preferences, foster brand loyalty with consistent and high quality product or services, and innovative marketing approach to stay ahead of the competition this include exploring new market segment and technologies for reaching customer. as long as there is demand and it is commercially profitable, it can be employed as a short-term solution.
2. The incremental innovation strategy involves balancing the business portfolio in other business unit sectors, such as service / operation maintenance, which the company already has. Based on business trends outlook for the power industry, one of the alternative business models in the

power industry is energy as a service. energy as a services offers various energy-related services rather than only supplying electricity such as energy advice, energy installation, and energy management (IRENA, 2019). By developing a new business model for renewable energy services, can increase the diversification of business lines owned by the organization that are related to the desired direction. This business model was chosen to utilize the present strengths of organizations that have been conducting business operation and maintenance for a long time and have capable employees with certifications that demonstrate professionalism. Based on the results of discussions with a source who was once a customer company, a professional company in carrying out its duties in overhauling five machines for PLN needs.

3. Product innovation strategy, by recombined knowledge embodied in new product. Conversion of diesel-powered generating sets to fuels derived from renewable sources. Another alternative is to convert the diesel generator to run on biodiesel, which is a form of diesel fuel made from renewable biomass sources such as vegetable oils or animal fats. This option may be the easiest as it involves replacing the diesel fuel system with a biodiesel fuel system, which is similar to the existing diesel system. This option may require modification to the generator's fuel system and control system. In addition, biomass has an installed capacity of 1616 MW in 2021, accounting for 56% of the entire installed capacity in the off-grid region. (MEMR, 2021) and The various forms of biomass (including waste) have a total capacity of 1.9 GW with the majority of this total comprises off-grid systems with a total capacity of more than 1.7 GW (IRENA, 2022). During the 2022 period, biofuel production also keeps increasing this year and its trend will continue to be positive next year, with an intensive research and development in the catalyst technologies for biofuels, processes needed to produce biofuels can become cheaper and more efficient (Arya, et al., 2021)
4. Product innovation strategy, converting generator sets that still use diesel fuel to gas engines, natural gas engines typically have higher thermal efficiencies than diesel engines, which can result in lower fuel consumption

and emissions and natural gas is a cleaner fossil fuel than diesel, it is considered as more environmentally friendly. This was chosen to enhance the efficiency of the current assets by analyzing the product's durability and utilization. This step might be chosen in the transition period for a brief length of time, even though it has not yet fully reached the usage of renewable energy. The proposed improvements in this proposal are based on the most efficient method for replacing diesel generators.

5. A system that is effective for storing, managing, exchanging information and knowledge inside an organization must be developed and maintained in order to improve knowledge organization for business support. These tactics can help a business organize its knowledge and information, which will improve decision-making, increase productivity and efficiency, and boost innovation and competitiveness. When the new business unit model was introduced, the internal readiness was excellent in all aspects, from the operating process to the availability of spare parts and maintenance, and the company was prepared to take responsibility for the items that were distributed.
6. Reconfirm plans for financial and investment computation. Using data-driven strategic calculations, the governance and strategy team and top management may determine future investment strategies for growing new firms and making investments. Organizations can optimize their risk-based operations, particularly their investments in the renewable energy sector. For scenarios that are projected to be unprofitable but can result in long-term cooperation impacts, it must be examined, for instance, if the assets possessed do not fulfill the requirements, then it is possible to rent other commodities or conduct a collaboration project.
7. One of the proposed tactics for building a new business model is to form strategic alliances with one of the firms in the field of technology or competitors in order to share knowledge, resources, and capabilities before developing a new business model for both products and services. This is done because the industry to be targeted is a new market, namely renewable

energy, and other corporations in the fossil fuel industry have also applied this pattern by focusing their capital expenditure on renewable energy research and development. Furhermore in dynamic markets,strategic alliances allow firms to limit their exposure to uncertainty in the market (Rothaermel, 2021).

8. Creating business sectors to increase product diversification through the use of renewable energy products and long distributed energy system or LDES batteries. LDES systems are designed to store large amounts of energy for at least 10 hours, utilizing advanced battery technologies that have a long cycle life, require less maintenance and replacement than other batteries, and are optimized for long-duration energy storage, making them well-suited for applications requiring extended energy storage, such as grid-level energy storage or backup power for critical infrastructure. This fits perfectly with the company's market share in the power rental industry. In addition, PLN is partnering with IBC (Indonesian battery business) on the development of one of the largest projects in Southeast Asia, the 100 MW LDES battery storage project in Sulawesi. This suggests that the utilities sector company's business market is likewise moving in this direction so that it can be linked with the company's goal.

Secara tahapan yang dilakukan adalah fokus untuk memaksimalkan aset yang dimiliki saat ini dengan melakukan product innovation strategy untuk diesel generator. Selama berjalannya waktu dan acive melakukan scanning terhadap masing-masing indicator langkah selanjutnya adalah mempersiapkan internal perusahaan sudah siap, dan melakukan inisiasi new project on renewable energy. ketika demand terhadap power rental busines ini terus menurun maka kesiapan perusahaan dalam memilih exit strategy sudah ada dan exit strategy yang dilakukan adalah fokus ke energy as a service or product diversify in LDES battery system

Alignment strategic imperatives with time frame

Table IV.3. 1. strategic implementation for innocuous scenario

Scenarios	2023-2024	2025-2026	2027-2028
Innocuous	- Early Warning System monitoring and planning - improve power rental business market trying to enter new segment market. - massive market penetration on non-utility market such as oil & gas industry, FMCG, and manufacture	- fuel efficiency installed such as common rail fuel injection and electronic control units. - installed technology in engine system hybrid fuel. - Starting to develop project about energy as a service.	- improving in technology on digitalization that remote monitoring and control of the generator's operation. - improvement on internal aspect, such as people, process, and technology to create a new product. - start renewable energy project on energy as service on renewable energy

Because of the low pace of technological advancement and the impediments to various policies and plans in the scenario based on condition 1, the primary goal of the selected strategy should be to maximize the existing assets. Diesel generators offer the dependability that renewable energy sources do not, hence one technique selected to establish a non-utility market is the cost leadership strategy. Enhancing the effectiveness and advanced control systems of currently owned generators since, according to consumer behavior, efficiency is what consumers will value most in the near future. In this case, the energy as a service business model was adopted for product diversification.

Table IV.3. 2. strategic implementation for behindhand scenario

Scenarios	2023-2024	2025-2026	2027-2028
behindhand	- Early warning system monitoring and planning - massive market penetration on non-utility market such as oil & gas industry, FMCG, and manufacture - strategic alliance, with another company to gain experience and learn about technology on renewable system	- improving in technology on digitalization that remote monitoring and control of the generator's operation. - installed technology in engine system for using biomass fuel.	- improvement on internal aspect, such as people, process, and technology to create a new product. - generating project planning about product in renewable energy - starting to renewable energy project on product in LDES batteries

For the scenario based on condition 2, the strategy formulated is to focus on developing asset power rental towards renewable energy because the policies are running faster than expected and the pace of energy transition is also according to plan. a cost leadership strategy can be chosen to enter the optimization of assets owned by opening new market segments. Doing improvement by producing products fueled by biomass or hybrid can be selected by using strategic aliances by join venture or import technology. Improved product diversification is by producing products with renewable energy fuels, such as using a gas engine that is more environmentally friendly, then using a generator set that runs on biomass.

Table IV.3. 3. strategic implementation for conquered scenario

Scenarios	2023-2024	2025-2026	2027-2028
Conquered	- Early warning system monitoring and planning - balancing portofolio business organization in operation & maintenance - installed technology in gas engine system. - installed technology in engine system using biomass fuel.	- improving in technology on digitalization that remote monitoring and control of the generator's operation. - utilization operation & maintenance business into new business model development energy as a service - already converting diesel into biofuel or biogas system	- start renewable energy project on power rental business model product in LDES batteries.

For the scenario based on condition 3, since the company's product innovation has been successful in incorporating renewable energy into its products. The primary goal of this strategy is to diversify business lines in favor of renewable energy products, specifically biomass fuel, and to invest in that sector using a LDES batteries model. However, the power rental business will continue until the utility sector's demand has drastically decreased, at which point the company will have other product diversifications that are ready for improvement.

Table IV.3. 4. strategic implementation for rateably scenario

Scenarios	2023-2024	2025-2026	2027-2028
Rateably	- Early warning system monitoring and planning - - balancing portofolio business organization in operation & maintenance - improving in technology on digitalization that remote monitoring and control of the generator's operation.	- improving in technology on digitalization that remote monitoring and control of the generator's operation. - start renewable energy project on power rental business model product in battery storage. - Collaborative project with another company on renewable energy project	- new business model introduces such as energy as services in battery storage.

For the scenario based on condition 4, the policy and pace of energy transition are on track, there are no delays, and the demand for fossil fuel energy has reduced; on the firm side, product innovation is feasible using the new technology. The primary objective of this scenario is to implement a renewable energy project by operating a business model for both services and goods. The chosen business line is energy as a service in the field of renewable energy and products in the form of battery models in the field of renewable energy, specifically LDES batteries.

IV.3.3 Justification

In designing this research, the authors have justified the company by discussing the results of the research. There is some feedback given by the company such as the type of exit strategy that was previously proposed by the author to be changed.

Initially the author proposed an exit strategy from a power rental business that uses diesel fuel to a solar system business that uses a leasing business model, the reason underlying the author is the similarity of business models, namely rental and leasing, of course, will provide an easier approach, in line with incremental innovation, namely an innovation that squarely builds on an established knowledge base and steadily improves an existing product or service offering (Rothaermel, 2021). Besides that, it is also based on the potential of the solar system in Indonesia based to (IRENA, 2022), Solar photovoltaic (PV) is crucial in all scenarios in the future due to Indonesia's enormous solar resources. At the end of 2021 total installed solar power generation capacity reached 190 MW (MEMR, 2021).

In a market with a red ocean, companies compete with one another for a share of the existing customer base, which frequently results in price battles and a reduction in the profit margins available to each company. The possibility of not entering the market has also been explained; consequently, the author makes an effort to locate other alternatives that are included in the implementation plan, specifically the storage of long-term energy using a battery system..

Chapter V Conclusion and Recommendation

V.1 Conclusion

As a result of the research conducted on the prior chapter's relevant literature, interviews with key stakeholder representatives, and situational analysis, the conclusions of the final project research are as follows:

1. The key focal issue for this case is how is the impact of power rental business to SM company in 5 years amidst the energy transition process to renewable energy, with driving forces that have the highest level of uncertainty and impact are government support & policy and technology advancement.
2. From the results of determining the driving forces, 4 scenarios are produced, namely innocuous, which is in the lower left quadrant where government support & policy is in a hampered condition and technology advancement is low, the second scenario is behindhand which is in the upper left quadrant where government support & policy is in a hampered condition and technology advancement is low , the third scenario is Conqueror is in the lower right quadrant where government support & policy is in punctual and technology advancement high conditions, and the last scenario is rateably in the upper right quadrant where government support & policy is punctual and technology advancement high.
3. The implications and options generated in this search vary based on each scenario, but the main objective is to added diversify product / business lines in order to address the main root problems faced by the company.
4. The early warning signal generated for this thesis consists of six factors, namely policy, technology, regulation, energy transition, economics, and environment. The implementation plan is made in the form of a proposed strategy aimed at increasing the company's product diversification based on each timeframe.

V.2 Recommendation

The recommendations provided are in the form of proposed strategies that can be implemented in each scenario.

1. Optimization of presently owned assets, including raising product efficiency, expanding market share in non-utility sectors like the oil and gas industry, or mining industry
2. The incremental innovation strategy involves balancing the business portfolio in other business unit sectors.
3. Product innovation strategy, the replacement of diesel fuel in generator sets with renewable energy sources like biomass.
4. Product innovation strategy, converting generator sets that still use diesel fuel to gas engines.
5. maintained a system that is effective for storing, managing, and exchanging information and knowledge inside an organization in order to improve knowledge organization for business support.
6. building a new business model is to form strategic alliances with one of the firms in the field of technology or competitors in order to share knowledge, resources, and capabilities before developing a new business model for both products and services.
7. Reconfirm plans for financial and investment computation. Using data-driven strategic calculations, the governance and strategy team and top management may determine future investment strategies for growing new firms and making investments.
8. Developing business segments to enhance product diversification by using renewable energy items, such as battery storage, with LDES batteries model & energy as a service business model

Due to the constantly changing nature of the industry, it is vital to assess and evaluate each indicator's early warning signals. Changes may cause scenarios and techniques to be modified and adapted to actual conditions.

References

Aliekperov, A., 2021. *Creating Business and Corporate trategy: An Integrated Strategic System.* s.l.:Routledge.

Arya, L. et al., 2021. . Current Trends and Future Prospects of Nanotechnology in Biofuel Production. *Catalyst.*

Bank Indonesia, 2022. *GDP Growth.* [Online] Available at: https://www.bi.go.id/en/statistik/indikator/data-inflasi.aspx

Barney , J. & Hesterly, W., 2014. *Strategic Management and Competitive Advantage 5th edition.* Upper Saddle River: Pearson Prentice Hall.

Bruske-Hohlfeld, I., Mohner, M. & Ahrens, W., 1999. A Case-Control Study of Lung Cancer in Florence, Italy—I. *Occupational Risk Factors: J. Epidemiol,* Volume 39, pp. 244-250.

Chandra, A., Jannif, N., Prakash, S. & Padiachy , V., 2017. *Cloud based real-time monitoring and control of diesel generator using the IoT technology.* s.l., nternational Conference on Electrical Machines and Systems.

Dale S, 2021. *BP Statistical Review of World Energy,* United Kingdom: BP PLC.

Dutton, J. E. & Jackson, S. E., 1988. *Discerning Threats and Opportunities.* s.l.:Sagge Oublications, Inc.

Garvin, D. A. & Levesque , L. C., 2005. *A note on Scenario Planning.* s.l.:Harvard Buisness Review.

Gausemeier, J., Fink, A. & Schlake, O., 1998. *'Scenario management: an approach to develop future potentials, Technological forecasting and social change.* Muenchen: s.n.

Grace, Q. & Claudia, A., 2019. Scenario analysis for strategy design: A case study of the Colombian electricity industry. *Energy Strategy Reviews,* pp. 57-68.

IESR, 2022. *Indonesia Energy Transition Outlook,* s.l.: IESR.

IESR, 2023. *Indonesia Energy Transition Outlook,* s.l.: IESR.

IRENA, 2019. *Innovation landscape brief: Energy as a Service,* Abu Dhabi: International Renewable Energy Agency.

IRENA, 2022. *Indonesia Energy Trasnition Outlook,* Abu Dhabi: International Renewable Energy Agency.

Johnson, G., Scholes, K. & Whittington, R., 2008. *Exploring Corporate Strategy: Texts and Cases,8th Edition.* United Kingdom: Prentice Hall International.

Kassu, J., 2019. *Research Design and Methodology.* s.l.:Intechopen.

Kompas, 2021. *Jejak dan Langkah Energi Terbarukan Indonesia,* Jakarta: Kompas Gramedia Nusantara.

Kvale, S., 1996. *InterViews.* Thousand Oaks: CA: Sage.

Lindgren, M. & Bandhold , H., 2009. *Scenario Planning: The link between fututre and strategy.* s.l.:Palgrave Macmillan.

Llyod, A. C. & Thomas, A. C., 2015. Diesel Engines: Environmental Impact and Control. *Journal of the Air & Waste Management Associatio.*

M. Augier, D. J. T., 2016. *The Palgrave Encyclopedia of Strategic Management.* s.l.:s.n.

Maack, J., 2001. *Scenario Analysis: A tool for task managers.* s.l.:s.n.

Maulidevi, N., Khodra, M., Susanto, H. & Jadid, F., 2014. *Smart online monitoring system for large scale diesel engine'.* s.l.:Book Smart online IEEE.

McKinsey&Company, 2021. *Net-zero power Long duration energy storage ,* s.l.: LDES Council.

MEMR, 2017. *Renacan Umum Energi Nasional,* s.l.: s.n.

MEMR, 2021. *Statistik Ketenagalistrikan,* s.l.: Sekretariat Direktorat Jenderal Ketenagalistrikan.

Our World in Data, 2022. *Our Wolrd In Data.* [Online] Available at: https://ourworldindata.org/ [Accessed December 2022].

Pandey, S., Mohanty, S. & Catalao, J., 2013. *An advanced LMI-based-LQR design for load frequency control of an autonomous hybrid generation system'.* s.l.:Springer.

Peng , M. W., Meyer, K. E., Estrin, S. & Bhaumik, S. K., 2009. Institutions resources and entry strategies in emerging economics. *Strategic amnagement Journal,* Volume 30, pp. 61-80.

PLN, 2021. *RUPTL 2021-2030,* s.l.: PLN.

Porter, M. E., 2008. *The Five Competitive Forces That Shape Strategy.* s.l.:Harvard Business Review.

Radosevic , S. & Yoruk, E., 2013. Entrepreneurial propensity of innovation systems: Theory, methodology and evidence. *Research Policy,* pp. 1015-1038.

Ramirez, R., Riku, Ö. & Daniel, G., 2013. *Scenarios and early warnings as dynamic capabilities to frame managerial attention, Technological Forecasting and Social Change.* ISSN 0040-1625 ed. s.l.:s.n.

Ravitch, S. M. & Riggan , M., 2016. *Reason & rigor: How conceptual frameworks guide research.* s.l.:Sage Publications.

Robson, C., 2002. *Real world research: A resource for social scientists and practitioner-researchers.* s.l.:Wiley-Blackwell..

Rothaermel, F. T., 2021. *Stratgeic Management Fifth Edition.* New York: Mc Graw Hill.

Saunders, M., Philip, L. & Thornhil, A., 2009. *Research methods for business students..* s.l.:Pearson education.

SBI, 2022. *SBI Scenario Approach.* [Online] Available at: http://www.strategicbusinessinsights.com/consulting/scenarioplan.shtml

Schoemaker, P. J. H., 1995. *Scenario planning: A tool for strategic thinking.* s.l.:Sloan Management Review.

Schwartz, P., 1996. *The Art of the Long View Planning.* New York: DOUBLEDAY.

SM Company, 2021. *Annual Report* , s.l.: s.n.

Tachev, V., 2022. *The Growth of Renewable Energy in Indonesia 2022 – Current State, Opportunities and Challenges.* [Online] Available at: https://energytracker.asia/renewable-energy-in-indonesia/ [Accessed December 2022].

T, Y. C., O.S, Y., F, M. H. & W, N. S., 2009. *Renewable energy technology portfolio planning with scenario analysis: a case study for Taiwan.* s.l.:Energy Pol.

Van Der Heijden, K., 2005. *Scenarios: the art of strategic conversation.* s.l.:John Wiley & Sons..

Van Zijverden, M., Van der Pijl, A. & Bol, M., 2000. Diesel Exhaust Carbon Black, and Silica Particles Display Distinct Th1/Th2 Modulating Activity. *Toxicol. Appl Pharmacol.*

Wack, P., 1985. *Scenarios: Uncharted waters ahead.* s.l.:Harvard Business Review.

Wandebori, H., 2019. *Manajemen Strategi Dalam Perspektif Indonesia.* Bandung: ITB Press.

William, J. R. & Pasman, J. H., 2021. Selecting a method/tool for risk-based decision making in complex situations. *Journal of Loss Prevention in the Process Industries.*

Wulf, T., Meissner , P., Brands, C. & Stubner, S., 2013. *Scenario-based strategic planning: A new approach to coping with uncertainty. In Scenario-based strategic planning Developing strategies in an uncertain world.* Wiesbaden: Springer Fachmedien Wiesbaden.

Yamashita, N., Sekine, K., Miyasaka, T. & Kawasima, R., 2001. Platelet-Derived Growth Factor is Involved in the Augmentation of Airway Responsiveness through Remodeling of Airways in Diesel Exhaust Particulate-Treated Mice. *J. Allergy Clin.*

Appendixes

Appendixes a. Result of Interview
Speakers: Mr. P

From: GM PLN Pembangkitan Sumatra Utara

Years' Experience: 20 Years

1. **Did you know SM Company?**

   Sumatra, Aceh, Nias, Riau, Kep. Riau is the area where I work and have a relationship with the SM company. Like one of the units in Arun, O&M uses the SM Company, which used to be famous for its power temporary business. Incidentally, for now a generator with an installed power of 3000 MW using SM will be too much.

2. **Current and future Power Rental business prospects**

   If now it's a bit difficult, except for temporary ones, the advantage is that the installation is fast but requires a large amount by analogy with 60 MW of power, the installation required 60 machines and only one and a half years will cost money and also damage the environment. In addition, instructions from the government to use renewable energy must be carried out.

3. **What are the prospects for the next 5 years?**

   It would be very difficult, but you can use biomass.

4. **The RPTUL program wants to convert PLTD, can you tell me what it's like?**

   Dedieselization is the current RPTUL program for converting diesel. In the future, Pln wants to use a hybrid by installing solar PV to reduce the use of fossil energy. The goal is zero carbon emission in 2060.

5. **What are internal & external factors should power temporary business?**

   Most importantly economical, especially hsd prices, regulations are also very important because for the future the main focus is zero emissions, reducing the use of fossil fuels and replaced with PV solar, wind, biomass, biodiesel. The diesel engine has been removed unless it is temporary. His main determination is to zero emissions to maintain sustainability for our children and grandchildren.

6. **What aspect that we must done to prevent the declining phase in organization**

   Now the company is focusing on professional service based, but in the future it must be able to convert PLtd to renewable energy. Must have the courage to

diversify the business to the most possible biomass. Because the fuel is almost the same, namely using fuel.

7. **Are there still opportunities in the midst of this energy transition? because it's possible that the whole plan doesn't run on time**

   PLN's philosophy is power, efficiency, renewable. The installation is not fast if during this transitional period the use of diesel will definitely be needed but it is temporary in nature but cannot be used as a long-term solution.

Speakers: Mr. M.A

From: Corporate Strategy Team of SM Company

Years' experience: 12 years

1. **What is current business challenge for company?**

   Regarding generators, namely regulations, the main customer is PLN, so the impact is when PLN regulations change to reduce diesel use, it will impact Sewatama customers. The company's portfolio has not diversified much product diversification.

2. **Would you identify as a critical issue for the power rental business?**

   Power rental is a business model, it must be underlined. And the sustainability will not be affected, but the market will always be there. The product will die, so product diversification must be added and varied. The second critical issue is the selected market segment above 100 Kva. Business power rental is full with unpredictable and temporary period.

3. **Identify 3 driving forces that have the most impact to future electricity business toward Indonesia power sector and global energy transition?**

   Policy regulation, innovation of product, Indonesia economic growth.

4. **What are expectations from Indonesia energy / electricity sector practitioner in terms of government and regulation to support the renewable energy transition?**

   It must be as attractive as possible to attract private business actors, with attractive tariff variations or purchase prices including for renewable energy. For now the multiplier factor is the basic cost of electricity generation and is different for each region. Do not let its own policies hinder energy growth.

5. **What are internal & external factors should power temporary business have to be a market leader in Indonesia energy transition?**

   Internal: good value chain end to end support, supporting inventory, reliable brand, types of solutions offered. External: capital or investment combined with technology factors. Must have a product that is better than power rental and O&M

6. **What issues should be prioritized to prevent unfavourable future conditions on the business, at least in the next 5 years?**

   Power rental must have wide and varied types of products and a long period of time. Knowledge from the organization must also be improved so that it supports the business and must be responsible for the goods that are leased. Utilization of digital technology that can reduce costs.

7. **How impact about the renewable energy transition to industries**

   All companies are encouraged to become green companies and have an impact on reducing demand for the fossil fuel generator industry.

8. **How is level of threat from substitute product?**

   The main substitute for electricity from PLN, the choice of renting a generator is to have the ability to buy power / connect power with PLN. Meanwhile, the replacement for diesel rental power is to replace the product with solar pv leasing.

9. **Based on the power rental, how significant consumer behaviour influence application and substitution product**

   Now the era of efficiency, green energy, saving, zero efficiency so that the market needs are like that, that is the challenge that companies must face.

10. **How is the prospect of Indonesia power rental business in the next 5 years**

    Moderate, in the next 5 years for power rental. For the utility declining sector and the moderate non-utility sector, it depends on the dynamics of the economy and PLN's performance.

Speakers: Mr. A

From: Engineering Operational Excellence of SM Company

Years' experience: 10 years

1. **What is current business challenge for company**

Government policy, diesel-fueled power rental which has been reduced by PLN.

2. **Can the current technology be updated or not?**

   We already have a diesel generator asset that converts diesel into mechanical energy to generate electricity, if you still use the same asset there is no other way but to use diesel.

3. **Would you identify as a critical issue for the power rental business?**

   The government's policy is driven by several factors such as reducing fossil fuels, imports of fuel now want to be reduced so that this connection drives policies to reduce diesel use.

4. **What are internal should power temporary business have to be a market leader in Indonesia energy transition?**

   SM several years ago its core business was selling assets to PLN, if the policy is like now the market will definitely go down. There are several factors that can still be improved, such as the use of technology in operation maintenance.

5. **What is digitalization at the SM Company like??**

   In terms of business support, they have started digitizing, but in the operational area, maybe only around 20% in terms of digitization. But when compared to competitors mostly there are many that are worse, there is only one that is better but already wants to close

   Not yet taking advantage of digitalization in several sectors whose potential should be utilized.

6. **What issues should be prioritized to prevent unfavorable future conditions on the business, at least in the next 5 years?**

   The market leader should be re-evaluated because the battlefield has changed, in the power rental business framework, namely clearly defining the company's strategy in which direction to go and making it based on data, not assumptions. The implemented strategy must be evaluated or improved. Not only selling anything as long as you get money even though revenue is achieved but that is not in accordance with the strategy.

7. **How impact about the renewable energy transition to industries?**

Now or 2 years from now, actually there won't be too many slots. The impact is there but not too big in the short term. But in the long term a long term project must be made to be able to compete in the renewable energy era

8. **How about bargaining supplier in power rental? Caterpilar especially**?
   As a Caterpillar product, it's broad, not only power generation, and there are lots of gas, mix, and diesel. When discussing solar, Caterpillar has unique value propositions compared to competitors, for example, different market segments, namely size. There are no different technologies, only size and specific fuel consumption. However, there are deficiencies in the ex-Waersilax digitization sector which implements digitization in its generator set, for example condition-based monitoring which is used for predictive maintenance, while Cat focuses on data collection for the manufacturing area so that data can be taken for more accurate insight into spare parts with the aim of maintenance based on a schedule but from a users can be assisted from a monitoring point of view for predictive maintenance.
9. **what is opportunity & threat for power rental business in future?**
   if you only take advantage of current technology to become even bigger it is difficult without any improvement in many ways. There must be an adjusting strategy to be able to compete in the future.
10. **How is the prospect of Indonesia power rental business in the next 5 years?**
    The difference is only in the scale of demand, because it is temporary, it will still be needed, but regulatory changes will be increasingly difficult to predict. It could be even more decline in the future. If you only focus on power rental, the scale will continue to decline and it may not be attractive for a business scale anymore.

Speakers: Mr. R & T

From: Business Expertise on Power rental industry

Years' experience: 8 years

1 **What are the most important issues happening right now for the power rental business industry? Especially for the power rental sector, which still uses non-renewable energy?**

Policy issues are actually a factor that can change business continuity, but on the business side it remains promising. Because nothing can replace a generator yet, a generator is a source of electricity that can be issued directly without starting stages and natural conditions and that will become the reliability of the generator. For the time being, 5-10 cannot be replaced with renewable energy because of its reliability, which requires fast processing time.

2 **Does the relationship between more installed capacity than PLN have anything to do with future business?**

The difference is that business rentals made by companies for PLN are then sold back to consumers, but business rental power that is rented out in hospital buildings, or with emergency and backup status is still very promising. From a utility standpoint, it is really influenced by policy factors, the difference in market segments is very influential and promising, for example, a data center building that requires temporary electricity, or there is no PLN electricity source yet, so a generator will play a role there.

3. **The power rental industry is dynamic, and many factors are unclear or uncertain, what do you think are the factors that can affect the sustainability of this business? Example: Government regulation, economy, technological advancement.**

Regulation still has the highest impact, followed by product innovation, and lastly technology.

4. **From the diesel engine itself, is there the most efficient way to make the engine still usable? In the midst of a renewable energy policy that reduces the use of diesel, is there a possibility to replace the generator with new fuel but use the same generator? Is the modification cost really big or not?**

It is still possible but requires installation / modification and additional equipment on the engine side. My estimate is that from the generator side it can still be used on the engine side to be replaced according to the fuel you want to use such as biomass, biogas or gas. Combining the generator and

engine is the trickiest and requires a high cost. PLTD to PLTmg can still be done but add more equipment towards the injection by adding equipment.

5. **what issues should be prioritized to prevent unfavourable business conditions in the future, at least in the next 5 years?**

   The transition period is 2030, it goes green based on the president's request, in my opinion there are still conflicts with existing regulations, for example PLTS regulations already exist and can, but when in the field the licensing process for operating PLTS is not that easy, there are still calculations and approval from PLN and finally in the field it will continue to operate but not yet legal. For 70;30 technology, the difference is only in the segment. This generator is a generator that is still used because of its reliability. Starting PLTS, PLTA takes hours while the generator only takes 10 minutes. Battery storage requires a large investment, and its use is still not effective because it only lasts 2-3 years and can be damaged.

6. **For companies that have generator assets with diesel engines, what fuel is the most efficient to change to renewable energy? Is it biofuel or biomass? Or have to replace the asset**.

   Gas engines, for biofuels or biomass, must require large areas of land, making them less suitable for urban areas. An example of a fireboat that uses a gas engine does not require a large area.

7. **In the next 5 years, what fuel generators will be able to compete in the renewable energy era?**

   Gas engine or Biomass source

Speakers: Mr. KP

From: Board of Director – Internal Organization

Years' experience: 20 years

1. **What are the issues and challenges currently being faced by the company?**

   If you look at this business from several angles: namely the power rental business itself and the second is the fuel. Power rental is still needed but in line with current developments is the fuel diversification. People think diesel

is bad, it should be an appropriate fuel if it's still needed in remote places. So you have to look at the market needs of one area with different regions. The main challenge is in terms of the type of fuel, the more PLN's transmission range, the less the need for power rental.

2. **Will there always be a market for power rental??**

   If we talk about the market for rental power and diesel, it won't grow, but it won't necessarily shrink. There is economic growth in the relevant areas where diesel rental will be needed. Will it grow? We don't expect it to grow as a general view, because the more fuel it comes in, the greater the sentiment against diesel which is seen as unclean and not cheap. Will it shrink? Not necessarily either, because the need for the rental business has persisted in the last two years. The size of the business has reached a saturation point, but it's still there except for when it will shrink.

3. **In the next 5 years, what fuel generators will be able to compete in the renewable energy era?** economically valuable.

4. **The power industry is dynamic with lots of uncertainties that are influenced by external factors that can disrupt business, what do you think is the most influential factor on the company's business.**

   State stability, if the country is not stable investors will not enter and cause the business model to be limited. If private electricity returns on investment, it will take a long time, so what is most needed is stability, that also depends on when we talk about the power industry.

   Beyond that, it is commercial in nature, such as technology, renewable energy. the highest impact is economic growth, technology advancement,

5. **What things should be prioritized to prevent unfavourable business conditions in the future, at least in the next 5 years?**

   My address is a bit different, unfavourable condition cannot be prevented because that's how we are adaptive to it, we implement risk based operations, risks regarding changes in the business climate we have to have a fairly disciplined risk management team whose job is to see all the potential that exists both in the market and finances and make sure are not trapped, end up in stalled products so that risk based operations in

investment carry out several alternative examples of bringing up solutions for renting tools so as not to cause a capital burden for the company. Risk management is the key that will develop into other aspects of the company. Risk based operations can help adapt in the event of a loss of business, will increase awareness and trigger the entire team to be agile and adaptive in the industry.

6. **How to maximize the current asset power? Is it possible to change fuel to renewable energy such as biomass?**

   There are some things I might not answer that we will do, maybe the way of thinking. People can be formed but things are not. For example, if the technology is not too old-fashioned and there is a possibility of switching, then we can switch, is there a market? We need to look deeper into that. For example, the technology is too old to do hybrid, but look at the market. The market is different because it's b2b so that's what matters. If it is, it cannot be done by rejuvenating assets towards renewable energy. doing so will increase the diversification of business models. However, it is the market and its products that must be considered whether they need it or not. Look at the market if you really need to diversify.

7. **What is next business model development that can be new prospect? How about energy as a service?**

   Energy as a service has been around for a long time, it depends on the company's existing business objectives.

Appendixes b. Questionnaire answer form each speakers

	Mr. P		Mr. A		Mr. AZ		Mr. RS		Mr. KP	
Driving Forces	Level of Uncertainty	Level of Impact	Level of Uncertainty	Level of Impact	Level of Uncertainty	Level of Impact	Level of Uncertainty	Level of Impact	Level of Uncertainty	Level of Impact
Government Support or Regulation	9	9	9	9	8	8	7	7	9	9
Indonesia Economic Condition	5	5	7	8	9	9	9	9	9	9
Technology advancement	7	8	9	8	9	9	8	7	8	8
Environmental Impact	9	9	5	7	8	8	8	8	7	7
Pace of Energy Transition in Indonesia	7	7	7	7	8	8	7	6	8	8
Digital Transformation	3	3	7	7	3	3	7	8	6	6
market price	7	3	8	3	8	5	7	5	8	4
employee capability	7	5	7	3	6	6	6	4	8	3
business development capability	7	7	5	5	6	6	5	5	8	5