

**INVESTMENT ANALYSIS OF NEW FIRE TRUCK
A CASE STUDY: PT. PUPUK KALIMANTAN TIMUR**

FINAL PROJECT

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

By

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**Master of Business Administration Program
School of Business and Management
INSTITUT TEKNOLOGI BANDUNG
2023**

ABSTRACT

INVESTMENT ANALYSIS OF NEW FIRE TRUCK A CASE STUDY: PT. PUPUK KALIMANTAN TIMUR

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(Master of Business Administration Program)

PKT, as a petrochemical company with high potential hazards, prioritizes emergency preparedness and response by complying with regulations and standards. In addition to serving its own needs, PKT's Fire and Rescue department also provides emergency services to four neighbouring companies through an annual fee cooperation scheme. To enhance the emergency response services, PKT conducted an evaluation and identified the need for an additional fire truck unit with up-to-date technology.

To determine the most suitable option, PKT is considered purchasing or renting the new fire truck units. A financial modelling analysis was conducted using income from health and safety services. The financial feasibility analysis, considering parameters such as NPV, IRR, and discounted payback period, resulted in a feasible outcome. The Purchase option exhibited better economic value, with a predicted NPV of Rp. 569,276,495, an IRR of 11.56% (higher than the discount rate of 10.5%), and a discounted payback period of 9.35 years.

Sensitivity analysis, using tornado and spider charts, revealed that the annual fee from clients or joint venture companies had the most significant impact on the project's financial performance, followed by manpower costs. A 20% increase in annual fees led to a significant increase in NPV Rp. 6,639,013,466, while a 20% decrease resulted in a significant decrease in NPV (-Rp. 5,500,460,477). Similarly, a 20% increase in manpower costs resulted in a decreased NPV of Rp. -3,500,609,667.

Based on the sensitivity analysis, the two significant factors influencing the purchase option were identified as the annual fee and manpower cost. Recommendations that are also put forward for this study are identification to anticipate increases in labor costs and to keep manpower costs under control. The increase in manpower costs must be accompanied by an increase in income. Exploring opportunities to attract additional clients, particularly companies in the industrial complex that do not yet have an agreement with PKT, is also advised.

By implementing these recommendations and ensuring cost control, PKT can optimize its emergency response services and maintain a financially viable operation.

Keywords: *Financial Model, Purchase Option, Sensitivity.*

ABSTRACT

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PKT, sebagai perusahaan petrokimia dengan potensi bahaya yang tinggi, mengutamakan kesiapsiagaan dan tanggap darurat dengan mematuhi peraturan dan standar. Selain melayani kebutuhan sendiri, Dinas Pemadam Kebakaran PKT juga memberikan pelayanan darurat kepada empat perusahaan tetangga melalui skema kerjasama iuran tahunan. Untuk meningkatkan pelayanan tanggap darurat, PKT melakukan evaluasi dan mengidentifikasi kebutuhan tambahan unit mobil pemadam kebakaran dengan teknologi terkini.

Untuk menentukan opsi yang paling sesuai, PKT mempertimbangkan opsi untuk membeli atau menyewa unit truk pemadam kebakaran baru. Analisis pemodelan keuangan dilakukan dengan menggunakan pendapatan dari layanan jasa keselamatan dan kesehatan Kerja. Analisis kelayakan finansial, dengan mempertimbangkan parameter seperti NPV, IRR, dan periode pengembalian yang didiskontokan, menghasilkan hasil yang layak. Opsi Pembelian menunjukkan nilai ekonomis yang lebih baik, dengan perkiraan NPV sebesar Rp. 569.276.495, IRR 11,56% (lebih tinggi dari discount rate 10,5%), dan discounted payback period 9,35 tahun.

Analisis sensitivitas, dengan menggunakan diagram tornado dan spider, mengungkapkan bahwa biaya tahunan dari klien atau *Joint Venture Company* memiliki dampak paling signifikan terhadap kinerja keuangan proyek ini, diikuti oleh biaya tenaga kerja. Kenaikan biaya tahunan sebesar 20% menyebabkan peningkatan NPV yang signifikan Rp. 6.639.013.466, sedangkan penurunan sebesar 20% mengakibatkan penurunan NPV yang signifikan -Rp. 5.500.460.477. Demikian pula, kenaikan biaya tenaga kerja sebesar 20% mengakibatkan penurunan NPV sebesar Rp. -3.500.609.667.

Berdasarkan analisis sensitivitas, 2 faktor signifikan mempengaruhi opsi pembelian yaitu biaya tahunan dan biaya tenaga kerja. Untuk mengantisipasi hal tersebut perlu dilakukan identifikasi terhadap potensi kenaikan biaya tenaga kerja dan menjaga agar biaya tenaga kerja tetap terkendali. Kenaikan biaya tenaga kerja harus dibarengi dengan peningkatan pendapatan. Mencari peluang untuk menarik klien tambahan, terutama perusahaan di kompleks industri yang belum memiliki perjanjian dengan PKT.

Dengan menerapkan rekomendasi ini dan memastikan pengendalian biaya, PKT dapat mengoptimalkan layanan tanggap daruratnya dan mempertahankan operasi yang layak secara finansial.

Kata Kunci: *Financial Model, Purchase Option, Sensitivity.*

VALIDATION PAGE

INVESTMENT ANALYSIS OF NEW FIRE TRUCK A CASE STUDY: PT. PUPUK KALIMANTAN TIMUR, INDONESIA

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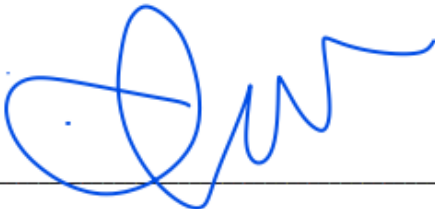
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Bandung, July 2023

Dannys Setyadi Wibawa

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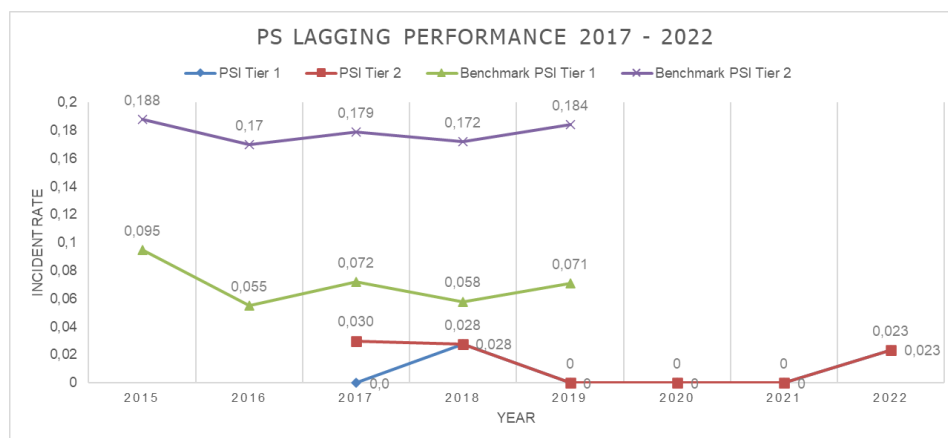
CHAPTER 1

INTRODUCTION

1.1 Background

PT Pupuk Kalimantan Timur (PKT) operates five ammonia plants, five urea plants and two NPK plants in Bontang Indonesia and has a production capacity of 3.43 million tons of Urea per year, 2.74 million tons of ammonia per year and 300 thousand tons of NPK per year. Apart from having 13 factories with the latest technology, PKT also has other supporting facilities such as Coal Boilers with a capacity of 560 tons of steam/hour, 6 Warehouses with a capacity of 315 thousand tons, 6 Jetty of 156 thousand DWT, 3 Ammonia Tanks with a capacity of 102 tons and ISO accredited Health and Safety Management system. 45001:2018. As a petrochemical company that has a major hazard process safety risk such as fire, explosion and toxic release, PKT has a company safety and health policy which includes the implementation of the Process Safety Management (PSM). PKT is committed to carry out all business process activities by always prioritizing safety and health through the implementation of a sustainable OHS management system.

Over the past 5 years, there have been 3 Tier 2 Process safety incidents and 1 Tier 1 Process safety incident at PKT which are depicted in Figure 1.1. Even though the PKT Process safety incident rate is still better than the average benchmark for chemical and oil and gas companies in the world, Process safety incidents certainly have a negative impact on the company that needs to be minimized.



- Source: statistic from Center for Chemical Process Safety (CCPS) Metric and U.S. Refining (API) PSE Summary Public Reporting for years 2014-2018.

Figure 1.1 PKT Process Safety Lagging Performance 2017-2022

In implementing Process Safety Management (PSM). PKT applies several mitigation and prevention layers to minimize incidents including emergency preparedness and response.

PKT's production facility is currently located in industrial complex which also have other tenants/companies located around PKT production facility. Among others, there are PT. Kaltim Parna Industri (KPI), PT. Kaltim Methanol Industry (KMI), PT. Kaltim Daya Mandiri (KDM), PT. Kaltim Nitrate Indonesia (KNI), PT. Kaltim Industrial Estate (KIE) and Pertamina Gas. Which are shown in figure 1.2. Which all of them are also the chemical and oil and gas industries which have great potential hazards in the form of fire, explosion and toxic releases.



Figure 1.2 PKT Industrial Complex

Table 1.1 Company's name and product.

No.	Company	Product
1	PT. Kaltim Parna Industri	Ammonia
2	PT. Kaltim Methanol Industri	Methanol
3	PT. Kaltim Nitrate Indonesia	Ammonium Nitrate
4	PT. Kaltim Daya Mandiri	Utilitas product (Steam, Electricity)

5	PT. Pertamina Gas	Gas Compression Station (CH4)
6	PT. Kaltim Industrial Estate	Industrial Complex and Warehouse
7	PT. Kaltim Ammonium Nitrat	Ammonium Nitrate

In implementing Health and Safety Management System on ISO 45001: 2018 and Permen Perind no. 19 year 2019 concerning on Prevention and Management of Chemical Emergencies in Chemical Industry Business Activities requires the companies prepares to be able to deal with emergency events that have the potential to occur in their operational activities. As a petrochemical company, PKT has facilities and infrastructure that fulfil the emergency preparedness and response clauses in accordance with these regulations and standards.

As a petrochemical company with high potential hazard, PKT has Fire Truck, Water Tender, Ambulance, Fire & Rescue Commander Car facilities, certified fire man Fire & Rescue training Gallery and Fire Water system including Fire tank, pipeline and Fire Pump.

Refer to this background, apart from preparing to deal with emergencies situation that have potential to occur in PKT, PKT also takes on the role of being able to provide emergency services to other companies in industrial complex by providing Health dan safety services to taking action emergency response in the event of emergency and abnormal situation which is dangerous in their facility of each company in industrial complex and creates a safe, healthy and productive industrial area.

Currently, 4 of 7 companies in the industrial complex have a Memorandum of Understanding (MoU) of cooperation with PKT in industrial emergency services with varying amounts of annual fees, depending on the classification level of risk and the number of units and their buildings. By looking at the potential for future industrial area development, there is an opportunity to increase the number of collaborations with other companies that will be built around the industrial complex, one of which is PT. Kaltim Ammonium Nitrate (PT. KAN).

Currently PKT has 9 fleets of fire trucks with an average usage period of more than 20 years. For this reason, in an effort to improve Health and Safety services at PKT and other clients in the area, PKT plans to add one of the new fire truck units whose technology is more up to date and has supporting facilities in the form of a tower ladder that PKT has never owned before. This type of unit is an Aerial Fire Truck which is also capable of helping firefighters reach high areas without having to climb to the plant or building.

To realize this, PKT has 2 alternative solutions in providing new fire truck units, The option is purchase or rent. The scheme to be used is to utilize income from health and safety services, so it is necessary to do financial modelling to determine which option is most suitable for these conditions.

1.2 Company Profile

PT. Pupuk Kalimantan Timur (PKT) is one of the subsidiaries of Pupuk Indonesia Holding Company (PIHC) that meet the increasing demand for fertilizer in line with the high development of the agricultural industry in Indonesia. PKT is the largest Urea and Ammonia producer in Indonesia

Indonesia that located in Bontang – East Kalimantan,

PKT have 5 Ammonia Plant with production capacity 2.74 million tons/ year, 5 Urea Plants with 3.43 million tons / year and 2 NPK Plants with 300 thousand tons/ year. Pupuk Kaltim also has other supporting facilities such as 2 Coal Boilers with capacity 560 tons of steam / hour, 6 Warehouses with a capacity of 315 thousand tons, 6 Jetty of 156 thousand DWT, 3 Ammonia Tanks with a capacity of 102 tons and ISO/ICE accredited laboratories. 17025:2017.

PKT' Production units currently owned.

Table 1.2 Company's name and product.

No	Pabrik	Tahun Berdiri <i>Year of Establishment</i>	Kapasitas Produksi (ton/tahun) <i>Production Capacity (ton/year)</i>			Plant
			Amoniak <i>Ammonia</i>	Urea	NPK	
1	Pabrik 1A	2014	660.000	570.000	-	Plant 1A
2	Pabrik 2	1982	595.000	570.000	-	Plant 2
3	Pabrik 3	1986	330.000	570.000	-	Plant 3
4	Pabrik 4	2002	330.000	570.000	-	Plant 4
5	Pabrik 5	2015	825.000	1.150.000	-	Plant 5
6	Pabrik 7					Plant 7
	NPK Fusion NPK Blending	2010 2005			200.000 100.000	NPK Fusion NPK Blending
Total			2.740.000	3.430.000	300.000	Total

PKT has a marketing area that includes domestic and export that show in Figure 1.3. Of which 50% of production is commercial / non-subsidized products.

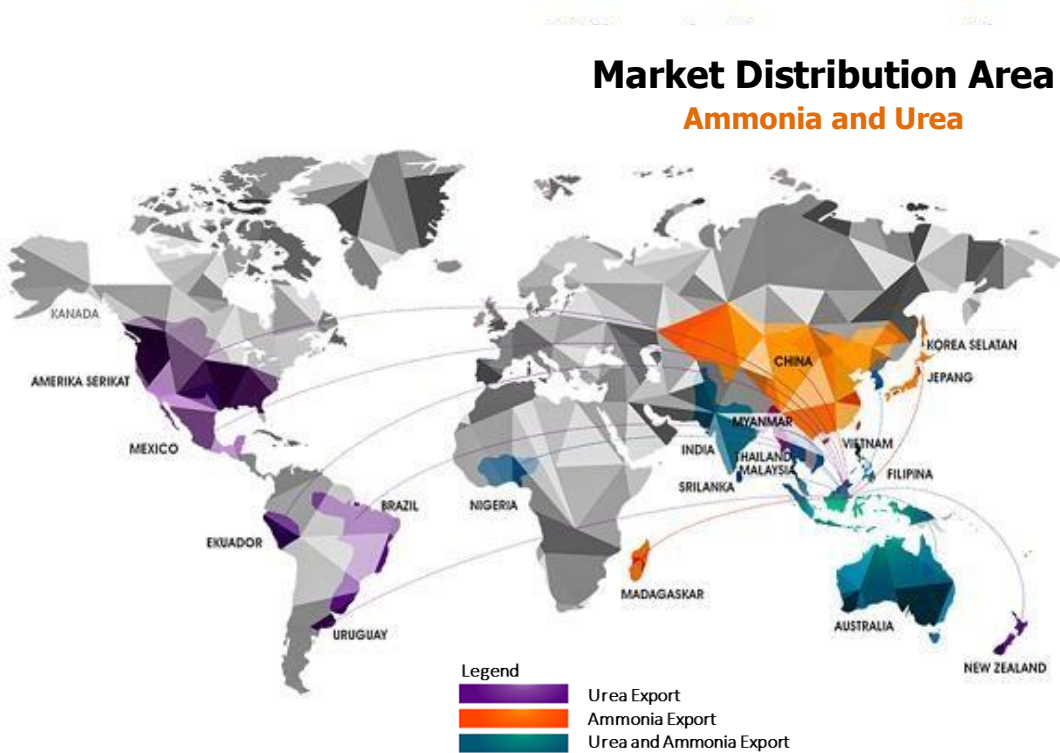


Figure 1.3 PKT Distribution Area

As a state-owned company, PKT is committed to providing the best result to support national fertilizer production. PKT main business is to produce and sell Urea Fertilizer, Ammonia and NPK Fertilizer to domestic and foreign market. The company's business activities area as follows:

1. Manufacturing Industry

Processing certain raw materials into basic materials needed for the manufacture of fertilizer, petrochemicals, agrochemicals, agroindustry and other chemicals and processing these basic materials into various types of fertilizers and other chemical products and their derivative products.

In addition to the production of fertilizer and ammonia products, PKT also produces factory utilities such as steam, electricity and demineralized water to meet the company's industrial needs. In order to support business continuity and strengthen its position in the manufacturing business. PKT specifically plans to expand its business in the field of methanol processing. This is indicated by the planning for the construction of a new processing unit and the preparation of industrial land in the PKT industrial complex.

2. Trading

Conducting the distribution and trading of urea, ammonia, fertilizer products, petrochemicals, agroindustry and chemicals both domestically and internationally, including imports of raw materials, supporting materials, fertilizer production equipment and chemicals.

In addition, to ensure and guarantee the industrial cycle starting from production of goods to reaching to consumer, PKT conducts pre-marketing activities in all marketing lines. Corporately, such policy makes the trading of fertilizer raw materials as a part of corporate business activities.

3. Services

Performing research studies, education, development, engineering design, bagging station, construction, manufacturing, plant operation management, repair, maintenance, consulting (except legal consulting) and other technical services in the fertilizer, petrochemical, agrochemical, agroindustry and other chemical industry as well as services in agriculture and plantation.

In the service sector, PKT conducts research and development consisting of product development, technology and factory maintenance services. The development of product research enables PKT to develop new products that will be marketed through the retail market. In factory maintenance services, PKT provides a variety of plant maintenance and repair services and equipped with facilities to produces a number of spare parts and continues to take part through the sale of services and equipment. The focus of PKT's services business continues to develop with the implementation of PreciPalm, which is smart farming solution management services to increase agricultural efficiency and land productivity.

Overview of PKTs Product



Urea is marketed under the brand name Daun Buah for the non-subsidized sector, with white fertilizer granules and a variety of packaging including 2kg, 5kg, 10kg, 20kg and 50kg. While subsidized urea is distributed with Pupuk Indonesia Holding Company (PIHC) logo, has pink fertilizer granules, with a 50kg package.



PELANGI JOS is an organic NPK Fertilizer with a certain composition and enriched with biological fertilizers or microbes, so that in one product there are nutrients of Nitrogen, Phosphate, Potassium and microbes that are beneficial to both soil and plants. The use of Pelangi JOS with a dosage efficiency of 20-25% obtained 10-15% higher productivity.

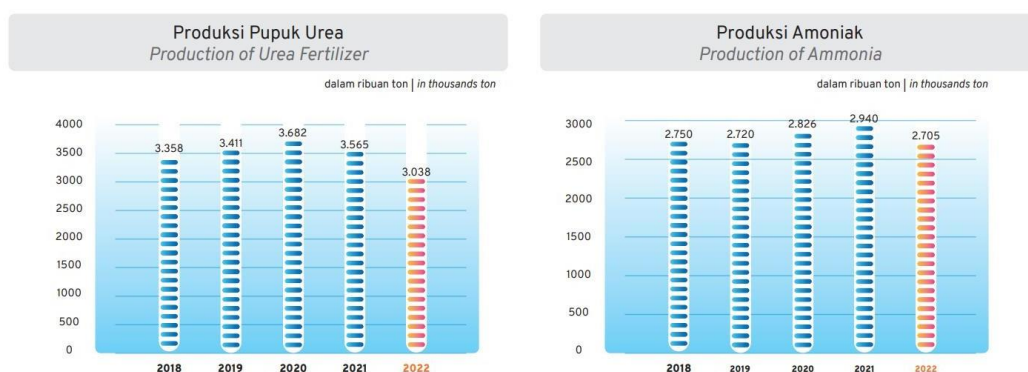
Production Performance

In 2022, the actual urea production was 3.04 million tons, or 88% of the production capacity of 5 (five) urea plant. This has decreased by 14.79% compared to 2021 due to improvement plant 5. Urea sales volume in 2022 was recorded at 2.99 million tons, or 84% of the target. The increase in sales value of urea fertilizer in 2022 was due to an increase in selling price, especially export selling prices which increase from average of USD387/ton in 2021 to an average of USD 582/ton in 2022.

And actual ammonia production in 2022 reached 2.70 million tons, or 99% of the production capacity of the company's 5 (five) ammonia plant. Ammonia sales volume in 2022 was 940 thousand tons, or 113% of the target. The increase in sales value of ammonia in 2022 was due to an increase in the average selling price of USD517/ ton in 2021 to an average of USD803/ton in 2022. In terms of sales volume, domestic ammonia was 31% while export ammonia was 69% of the total Ammonia sales volume

Meanwhile, the total actual NPK production in 2022 reached 251 thousand tons, or 100.5% of the target.

The actual NPK sales in 2022 reached 225 thousand tons, or 76% of the target.



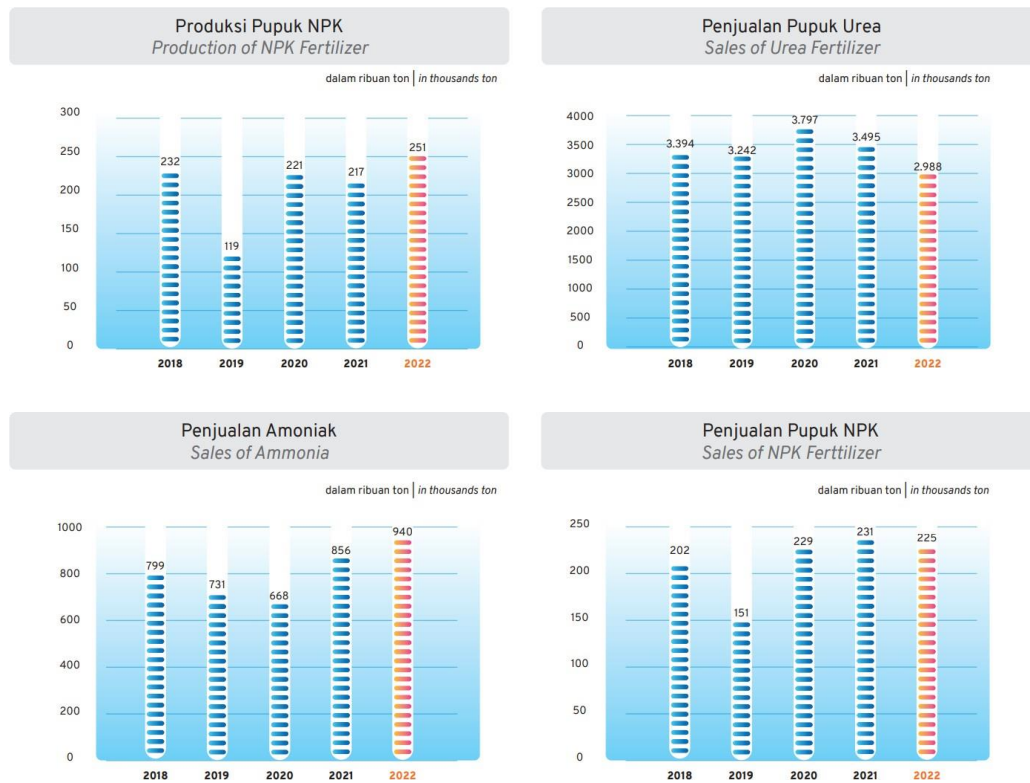
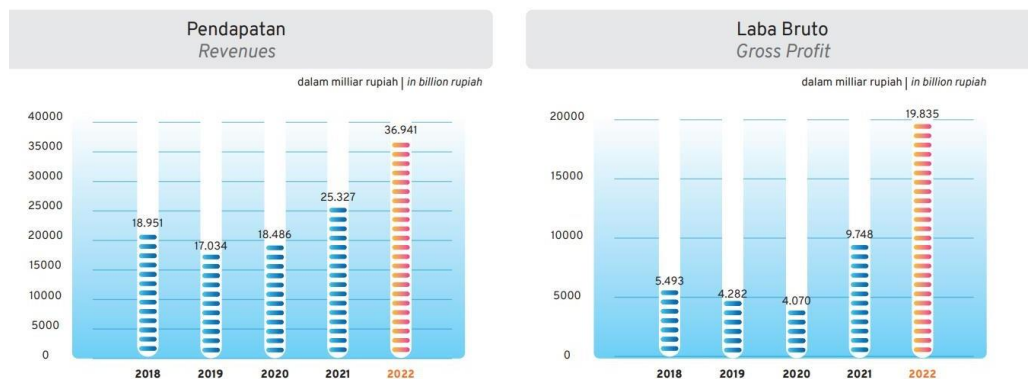


Figure 1.4 PKT Production Performance

Financial Performance

The Company's revenue in 2022 amounted to Rp36.94 trillion, an increase of 46% compared to 2021 Rp25.33 trillion. The increase in average international urea and ammonia prices supported the Company's revenue growth. The average export ammonia price in 2022 was USD816 or 62% higher than in 2021, which was USD505/ton. The average export urea price was USD582/ton or 51% higher than in 2021, which was USD387.



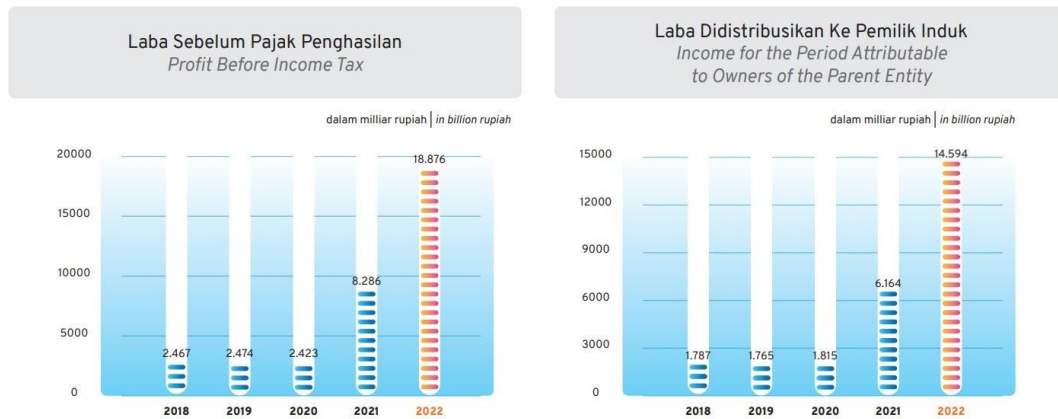


Figure 1.5 PKT Financial Performance

Total equity in 2022 was recorded at Rp.34,387 billion, an increase of Rp8,688 billion or an increase of 34% from 2021 of Rp25,691 billion. There was a significant increase in retained earnings, which amounted to Rp15,877 billion or 101% compared to the previous year.



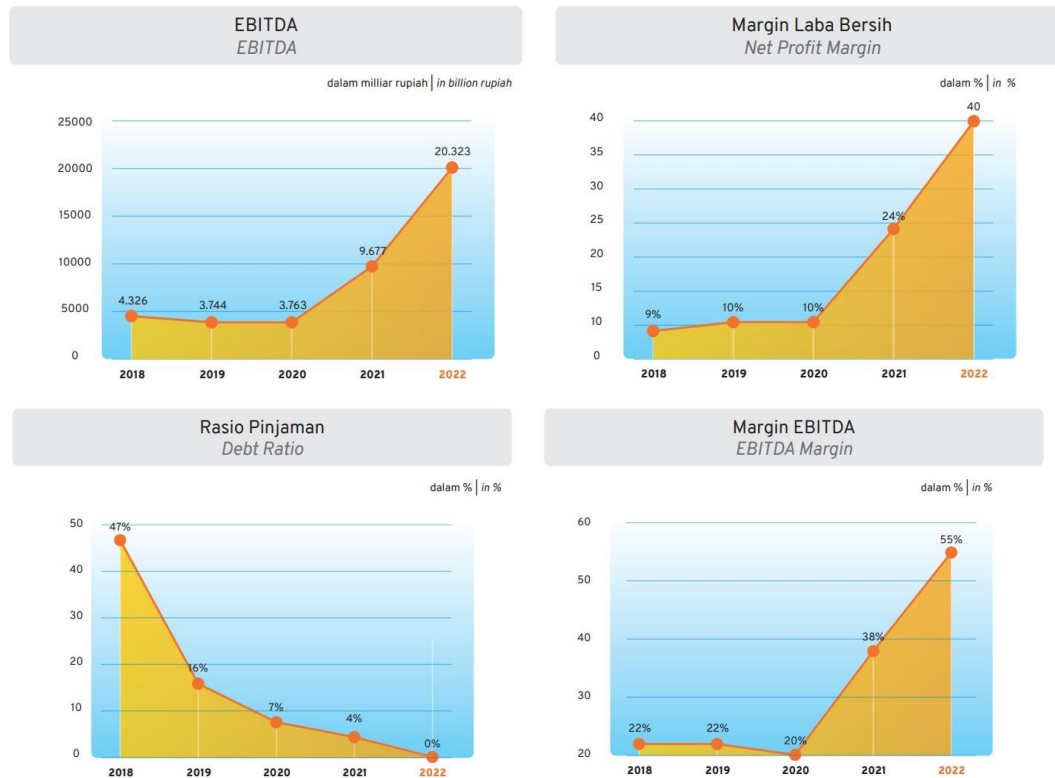


Figure 1.6 PKT Asset and Financial Ratio

1.3 Business Issue

In emergency preparedness and response, PKT has supporting facility such as Fire Truck, Water tender, Ambulance, Command Car dan fire man. The percentage of fire and rescue fleets are 64 owned by PKT and 36% is rent.

Current fleet of the emergency preparedness

Table 1.3 List of Fire and Rescue Fleets

No	Item No	Type	Prod. Year	Age	Brand	Remark
1	PKT 290	Fire Truck	1982	41	ISUZU	PKT
2	PKT 156	Fire Truck	1982	41	Mitsubishi	PKT
3	PKT 396	Fire Truck	1989	34	Mercedes	PKT
4	PKT 409	Fire Truck	2002	21	Mitsubishi	PKT
5	PKT 410	Fire Truck	2004	18	HINO	PKT
6	PKT 414	Fire Truck	2007	15	HINO	PKT
7	PKT 416	Fire Truck	2012	11	HINO	PKT

8	PKT 404	Water Tender	1998	25	Mitsubishi	PKT
9	PKT 406	Water Tender	2002	21	ISUZU	PKT
10	PKT 850	Command Car	2019	4	Toyota Hilux	Rent
11	PKT 851	Command Car	2019	4	Toyota Hilux	Rent
12	PKT 8035	Ambulance	2023	0	Toyota Hiace	Rent
13	PKT 8032	Ambulance	2023	0	Toyota Hiace	Rent
14	PKT 107	Fire & Maintenance Facility	2020		Toyota Hilux	Rent

The list of equipment above is a means of supporting emergency preparedness at PKT, with varying usage life. In general, average life expectancy of a fire truck is around 20 years. (Insurance Grading Recognition of Used and Rebuilt Fire Apparatus). From data above, 7 of 9 fire trucks are more than 20 years old. To operate a fire truck that is more than 20 years old, extra maintenance and testing are required, so that its performance can be maintained. Of all these units, PKT also does not yet have a type of fire truck that can evacuate and deal with fires at height

In the last 10 years, PKT has added 2 new plants, there are Plant 5 and Plant 1A. where the addition of these production facilities also has the potential to increase the risk of explosions, fires and gas leaks.

Apart from serving PKT itself, PKT's Fire and Rescue is currently also serving 4 companies around the area for handling emergencies with a cooperation scheme through the payment of an annual fee. PKT's Fire and Rescue also provides stand by emergency services during ammonia shipment activities carried out by a Joint Venture Company (JVC). So that the role of PKT's Fire and rescue team in this industrial area is quite important to mitigate the impact of an industrial emergency. Looking at several factors and through an evaluation carried out by PKT's Safety Department. it is necessary to improve emergency response services, by providing or adding one fire truck unit units whose technology is more up to date and has supporting facilities in the form of a tower ladder. This type of unit is an Aerial Fire Truck which is also capable of helping firefighters reach high areas without having to climb to the plant or building.

To realize this, PKT has 2 alternative solutions in providing new fire truck units, The option is purchase or rent. The scheme to be used is to utilize income from health and safety services, so it is necessary to do financial modelling to determine which option is most suitable for these conditions.

1.4 Research Questions

PKT plans to improve emergency response services by provide of new unit Aerial Fire Truck.

- a. Which option is going to be used to provide a new aerial fire, purchase or rent?
- b. What factors may affect the financial feasibility project by financial and operational risk in this project?

1.5 Research Objectives

There are several objectives of this research

- a. To find out the optimal cost between purchase or rent alternative scenarios to provide a new unit aerial fire truck in 10-year projection.
- b. To find out the net cash flow on each option for 10-year projection.
- c. Select the alternative option to provide new aerial fire truck by financial feasibility. (NPV, IRR, Discounted Payback Period)

1.6 Research Scope and Limitation

- a. This research only analysis on Fire and Rescue services and financial feasibility.
- b. This new fire truck investment project is projected for 10 years, and has a salvage value of 40% in the 10th year.
- c. If there are other costs that may be present after the project lifetime, related to demobilization, asset transfer or other costs that are beyond this final project's scope.

CHAPTER 2

LITERATURE REVIEW

A literature analysis was conducted to understand the current business issue and determine the optimal course of action for resolving them, considering the present conditions and scenarios.

2.1 Theoretical Foundation

Companies have to make sure that every investment choice increases value for shareholders over and beyond the cost of the investment. Estimating the cash flow that a new investment would provide is crucial when doing a financial analysis for investments. Understanding the parameters used to calculate PKT's cash flow is essential given that the firm is the state-owned enterprise.

2.2 Problem Exploration

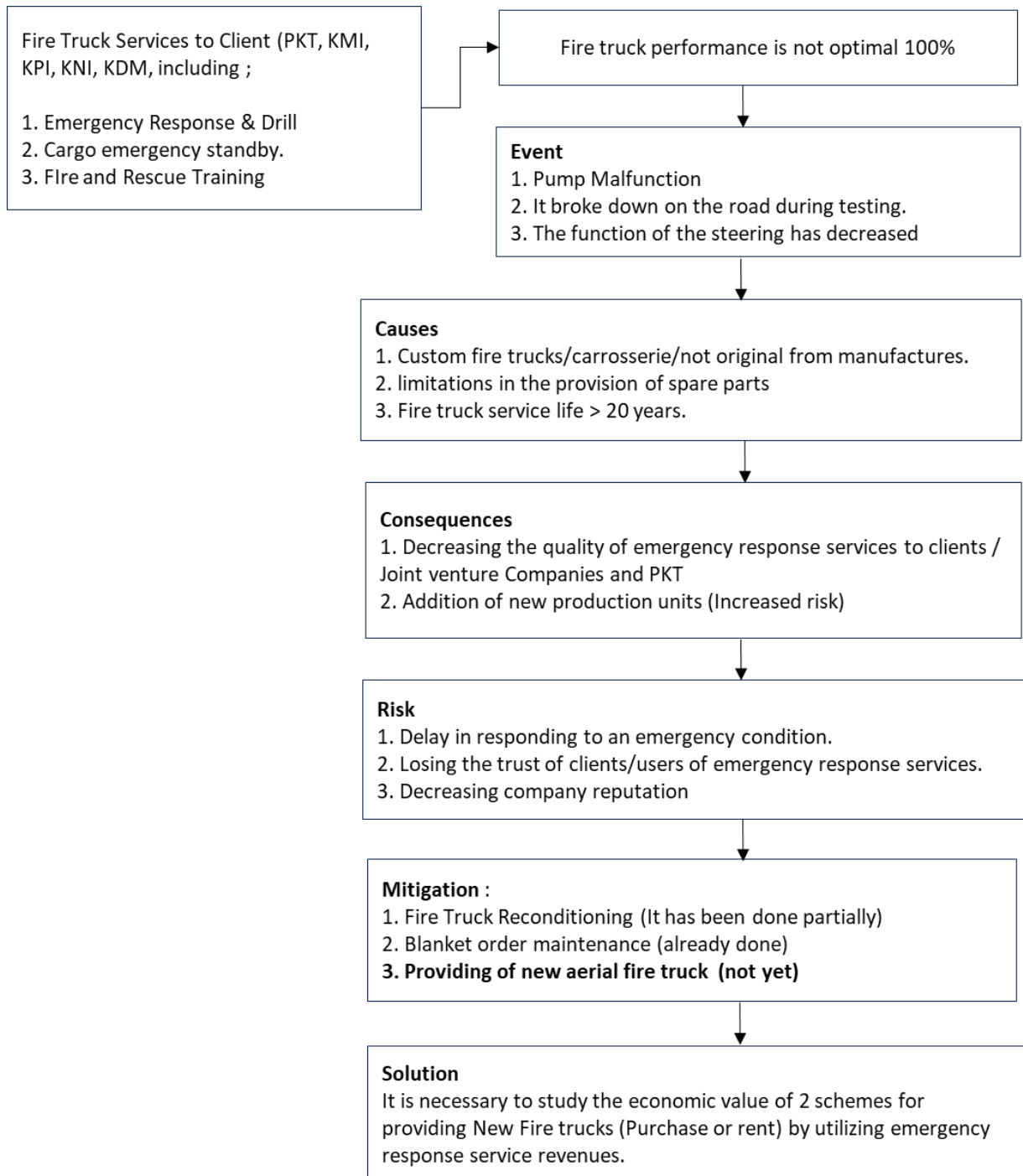


Figure 2.1 Problem Mapping

(Source: Author Analysis)

PKT has an important role in providing fire and rescue services in industrial areas, because PKT is the only company that has an adequate fleet. However, along with

increasing risks to safety, it is necessary to have follow-up actions to accommodate these risks so that they are acceptable. Especially in the provision of New Aerial Fire Trucks.

There are 2 options that are most likely with the company's current conditions. that is, purchase or rent. These alternative options will be determined based on financial modelling calculations.



Figure 2.2 Aerial Fire Truck Model

2.2.1 Operating Cost Sharing

Operational costs for fire and rescue activities are cover by PKT and several client /companies with the following details:

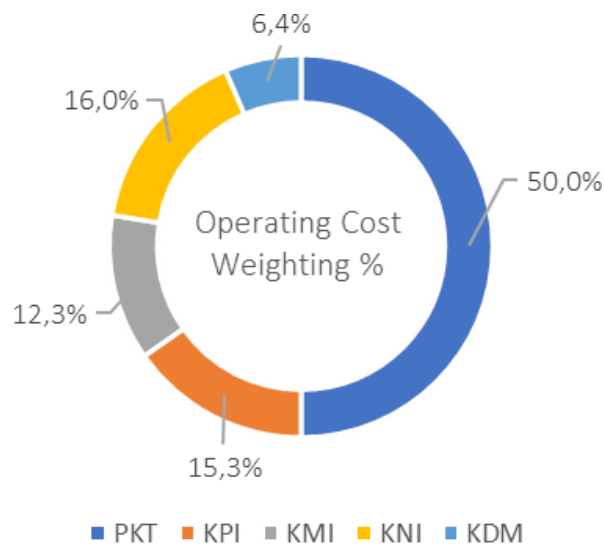


Figure 2.3. Operating Cost Sharing percentage (%)
(Source: Company's data)

The Weighting of operational costs is determined based on the risk category of each company by looking at the number of buildings and the number of plants

2.3 Capital Expenditure.

A capital expenditure is an outlay of funds by the firm that is expected to produce benefits over a period of time greater than 1 year. This study focuses on a capital expenditure directed specifically towards the procurement of new equipment, namely a fire truck and its accessories. The research evaluated two potential options for obtaining the fire truck: purchasing or renting. These alternatives will be carefully examined to determine their cost-effectiveness and the advantages they offer to the company.

2.4 Operating Expenditure.

Opex (operational expenditure) refers to the money a firm or organization spends continuously and regularly on its operations. The expenses might be one-time or ongoing. These expenses in this project might include anything related to the fire and rescue operation such as maintenance, fuel used to run the fleet and salaries given to personnel.

2.5 Discounted Cash Flow (DCF)

DCF is a valuation technique that estimates an investment opportunity's attractiveness by projecting future cash flow and discounting them (most frequently using weighted average cost of capital) to arrive at a present value that used to evaluate the investment opportunity (Garrison,2012)

Garrison (2012) define DCF strategies as those that consider the time value of money. Their premise is that a dollar today is more valuable than a dollar tomorrow. If the value determined by DFC analysis is more that the investment's present cost, the opportunity may be worthwhile.

Discounted Cash Flow Formula is :

$$DCF = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_n}{(1+r)^n} + \dots$$

Where :

CF_1 = The cash flow for year one

CF_2 = The cash flow for year two

CF_n = The cash flow for additional years

r = The discount rate

The concept of DCF is based on the idea of the growth of cash invested by investor by certain percentage over time. The presence of “discounted” term is due to the calculation of the cash itself is an estimation in the future, which takes into consideration the interest rate (Commonly using Weighted Average Cost of Capital) Which may differs between investors based in their consideration and decided financing option. Hence, the valuation of the cash flow is taken into present time equivalent.

The Calculation formula is as follow:

$$PV = \frac{FV_n}{(1 + r)^n}$$

Where :

PV : Present Value

FV : Future Value

n : Periods from initial investment

r : Interest rate

2.6 Capital Structure

Capital structure is one of the most complex areas of financial decision making because of its interrelationship with other financial decision variables. Poor capital structure decisions can result in a high cost of capital, thereby lowering the NPVs of projects and making more of them unacceptable. Effective capital structure decisions can lower the cost of capital, resulting in higher NPVs and more acceptable projects—and thereby increasing the value of the firm. (Gitman, 2013) Capital structure refers to the specific mix of debt and equity used to finance a company's assets and operations. From a corporate perspective, equity represents a more expensive, permanent source of capital with greater financial flexibility. Financial flexibility allows a company to raise capital on reasonable terms when capital is needed. Conversely, debt represents a cheaper, finite-to-maturity capital source that legally obligates a company to make promised cash outflows on a fixed schedule with the need to refinance at some future date at an unknown cost.

Types Of Capital

All of the items on the right-hand side of the firm's balance sheet, excluding current liabilities, are sources of capital. The following simplified balance sheet illustrates the basic breakdown of total capital into its two components, debt capital and equity capital:

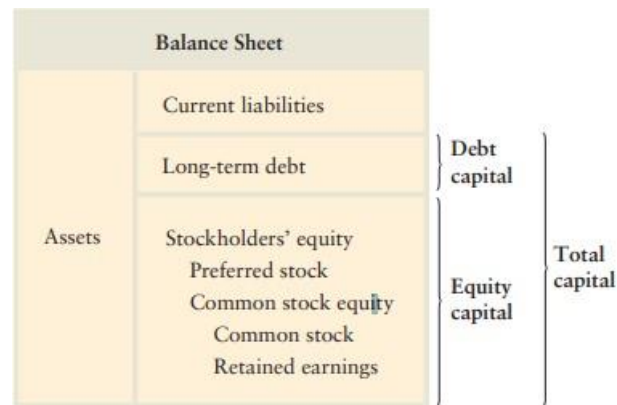


Figure 2.4 Types of Capital

The cost of debt is lower than the cost of other forms of financing. Lenders demand relatively lower returns because they take the least risk of any contributors of long-term capital. Lenders have a higher priority of claim against any earnings or assets available for payment, and they can exert far greater legal pressure against the company to make payment than can owners of preferred or common stock. The tax deductibility of interest payments also lowers the debt cost to the firm substantially.

Unlike debt capital, which the firm must eventually repay, equity capital remains invested in the firm indefinitely—it has no maturity date. The two basic sources of equity capital are (1) preferred stock and (2) common stock equity, which includes common stock and retained earnings. Common stock is typically the most expensive form of equity, followed by retained earnings and then preferred stock. Our concern here is the relationship between debt and equity capital. In general, the more debt a firm uses, the greater will be the firm's financial leverage. That leverage makes the claims of common stockholders even more risky. In addition, a firm that increases its use of leverage significantly can see its cost of debt rise as lenders begin to worry about the firm's ability to repay its debts. Whether the firm borrows very little or a great deal, it is always true that the claims of common stockholders are riskier than those of lenders, so the cost of equity always exceeds the cost of debt.

2.6.1 Cost of Long-Term Debt

In Financing a project, usually a company does not use the equity to cover all capital requirements. Instead, a combination with a long-term debt is used to share the risk of the project, as well as sharing the profit to the creditors involved. The cost of long-term debt of a company is usually approximately equal to the interest rate on a loan, which may be delivered from banks, or non-bank financing institution with particular rating from the government. The calculation formula of cost of long-term debt is as follow:

$$r_i = r_d \times (1 - T)$$

Where:

r_i : Cost of Debt after tax

r_d : Interest Rate (Cost of debt before tax)

T : Income Tax Rate

2.6.2 Cost of Equity

In determining the cost of equity, the discount rate of the project will be strongly depending on the opportunity cost of each company owners. The opportunity cost addressed in this case is the possible return that most likely to be achieved if the owners of the fund invest their money in other project at certain risk level. To obtain the cost of equity, Capital Assets Pricing Model (CAPM) is commonly used in wide range of long-term project. In CAPM approach, Cost of equity is equal to risk free rate with addition of risk premium to cover the investment risk. Risk premium is used by multiplying beta with the subtraction of market risk of return and risk-free rate. The beta itself, is the risk added by an investment into the portfolio market. The calculation of cost of equity uses the following formula:

$$r_s = R_f + \beta (r_m - R_f)$$

Where:

r_s : Cost of Equity

R_f : Risk free rate

r_m : Market rate of return

β : beta

2.6.3 Weight Average Cost of Capital (WACC)

The weighted average cost of capital, r_a , results from a weighted average of the firm's debt and equity capital costs. At a debt ratio of zero, the firm is 100 percent equity financed. As debt is substituted for equity and as the debt ratio increases, the WACC declines because the after-tax debt cost is less than the equity cost ($r_i < r_s$). In this range, the tax benefits of additional debt outweigh the costs of borrowing more. However, as the debt ratio continues to increase, the increased debt and equity costs eventually cause the WACC to rise. In other words, the bankruptcy costs, agency costs, and other costs associated with higher debt levels eventually outweigh the additional tax benefits that the firm could generate by borrowing even more.

Since both sources of funds have different required return, the portion of each in funding the project is used to represent the overall cost of capital, which is later referred as weighted average cost of capital (WACC). Essentially, the WACC is a hurdle rate, the minimum acceptable return that a firm should earn on any investment that it makes. On this case, WACC uses internal company data that has been set, so there is no need for calculations

2.7 Hurdle Rate

Hurdle rate is defined as the minimum expected return that investment projects are required to meet in order to receive funding (Dutta & Fan, 2009) Based on existing assessment on the hurdle rate, the variation across firms can be considered appear in a wide range (Poterba & Summer, 1995). Despite of in the average, firms tend to have lower hurdle rates than their cost of capital in certain projects, there are some conditions that the firms have higher hurdle rate compared to the project's cost of capital executed within the firms. In PKT, based on the interview with the investment and development team, commonly used discount rate or defined as hurdle rate in this final project is 10,5 % on the average.

2.8 Investment Decision Analysis

Investment decision analysis is the process of assessing and analyzing investment possibilities in order to allocate financial resources in a well-informed manner. It entails evaluating several investment possibilities, taking into account their possible risks and rewards, and choosing the best investment projects.

Investment decision analysis involves:

1. Identifying investment opportunities aligned with organizational goals through market analysis and feasibility assessment.
2. Evaluating investment alternatives based on financial viability, returns, risks, and metrics like NPV, IRR, and Payback Period.
3. Assessing potential risks associated with each option, considering market, economic, and regulatory factors.
4. Conducting detailed financial analysis, including cash flow projections, to understand the investment's impact on the organization.
5. Integrating analysis findings with strategic objectives, risk tolerance, and financial constraints to make informed decisions.
6. Continuously monitoring and reviewing the chosen investment, identifying necessary adjustments or corrective actions.

Investment decision analysis maximizes returns and minimizes risks, enabling organizations to align investments with goals, strategies, and risk tolerance

2.8.1 Net Present Value

NPV is a method that takes into account the time value of money and helps assess the profitability and viability of an investment project. This project explores the concept of NPV, its calculation, and its significance in decision-making processes. To calculate NPV, one needs to estimate the expected cash flows associated with the investment project over its projected life and discounted them back to the present using an appropriate discount rate. The discount rate typically reflects the company's cost of capital or the minimum required rate of return. The formula for NPV is as follows:

$$NPV = \frac{Cash\ Flow_1}{(1+r)^1} + \frac{Cash\ Flow_2}{(1+r)^2} + \frac{Cash\ Flow_n}{(1+r)^n} - Initial\ Investment$$

The outcome of NPV calculation can result in a positive, negative, or zero value. A positive NPV indicates that the investment is projected to generate higher value than its initial cost, indicating potential profitability. Conversely, a negative NPV suggests that the investment may not yield enough returns to recover the initial investment, resulting in a loss. Finally, a zero NPV signifies that the investment is expected to break even, generating returns equal to the initial cost.

2.8.2 Internal Rate Return (IRR)

The Internal Rate of Return (IRR) is a financial metric used to evaluate the profitability of an investment project. It represents the discount rate at which the present value of cash inflows equals the present value of cash outflows, resulting in a net present value (NPV) of zero.

The IRR is often considered an essential tool in investment analysis as it helps determine the potential return on an investment and assess its viability. It measures the percentage rate of return that an investment is expected to generate over its projected life.

To calculate the IRR, the cash inflows and outflows associated with the investment project are discounted to their present values. The discount rate is then adjusted iteratively until the NPV equals zero. This discount rate, at which the NPV becomes zero, is the IRR. If the IRR is greater than the required rate of return or the cost of capital, the investment is considered financially viable and potentially profitable. On the other hand, if the IRR is lower than the required rate of return, the investment may not generate sufficient returns to cover the cost of capital, indicating a potential loss.

The IRR is frequently utilized with financial metrics like NPV and payback period to thoroughly evaluate investment opportunities. It enables investors and decision-makers to compare and prioritize projects based on their anticipated returns, facilitating informed investment decisions.

2.8.3 Discounted Pay Back Period

According per Gitman & Zutter (2012), the payback period is a metric used to calculate the duration required for a company to recover its initial investment in a project through cash inflows. However, the payback period is regarded as a relatively basic capital budgeting technique since it fails to explicitly consider the concept of the time value of money.

To address this constraint, a more inclusive approach is to employ the Discounted Payback Period. By incorporating the time value of money, the discounted payback period adjusts future cash flows to their present value. This technique determines the number of years needed to recoup the initial investment by considering the discounted cash flows.

The discounted payback period incorporates discounting to accurately determine when the project's cash inflows will match or exceed the initial investment on a present value basis. This approach provides a more sophisticated and financially prudent measure for evaluating the break-even time and recovering the initial investment.

2.9 Sensitivity Analysis

Sensitivity analysis is a technique used in financial modelling and decision-making to assess the impact of changes in input variables on the output or outcome of a model. It helps evaluate the sensitivity or responsiveness of a model's results to different scenarios or variations in the input assumptions.

The purpose of sensitivity analysis is to understand how changes in key variables affect the overall outcome, such as financial metrics, project viability, or risk exposure. By conducting sensitivity analysis, decision-makers can gain insights into the robustness and reliability of their decisions in the face of different circumstances or uncertainties

Sensitivity analysis involves the following steps:

1. Identify Key Variables: Determine significant input variables affecting the model's output, such as market conditions, costs, interest rates, or demand.

2. Define Assumptions: Specify a range of values or scenarios for each key variable, including best-case, worst-case, or realistic scenarios.
3. Analyze Impact: Recalculate the model using different input values to observe resulting changes in the output, assessing the impact of variable variations.
4. Interpret Results: Understand how changes in input variables affect the model's output, identifying influential factors and their implications for decision-making.

Sensitivity analysis enhances decision-making by providing insights into risks, uncertainties, and opportunities. It identifies key drivers of outcomes, improving risk management and strategic planning. Decision-makers gain a deeper understanding of how choices perform under various scenarios, enabling informed and robust decisions in complex environments.

2.10 Conceptual Framework

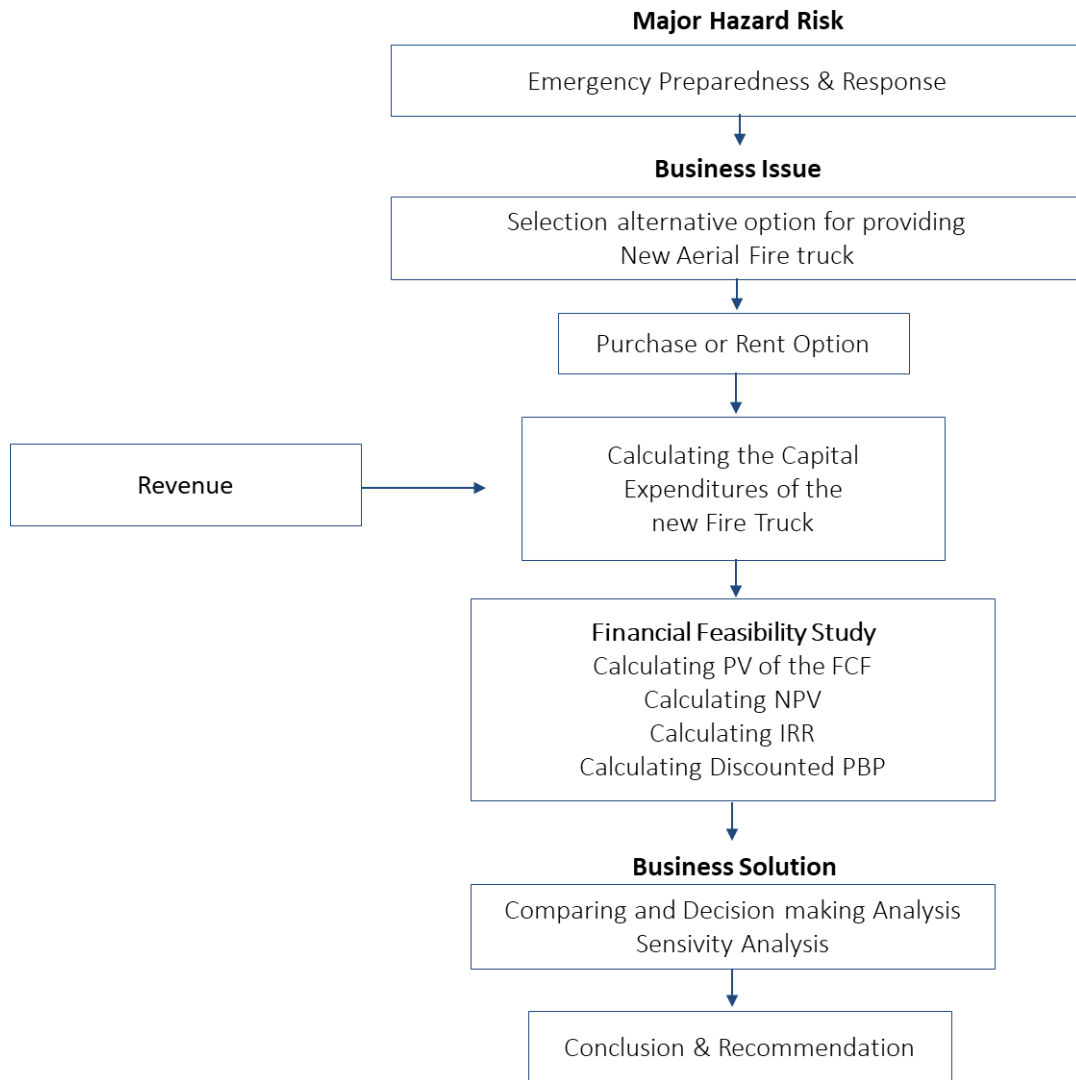


Figure 2.5 Conceptual Framework

(Source: Author Analysis)

The conceptual framework above consists of several steps to find a solution in determining the capital structure of New Fire Truck investment in Safety Department PKT. The initial phase is starting from the identification of major hazard risks and the need to fulfil the requirement of the Safety & Health Management System (SMK3) in Emergency Preparedness and response. This condition is related to the readiness of supporting facilities such as fire trucks that

owned by PKT. Development business issues is needed to identify problems in emergency preparedness and emergency services.

The buying-renting decision involves application of the financial feasibility, it will be determined whether it is financially feasible or not and to find which alternative has better financial model by NPV, IRR and discounted payback period.

CHAPTER 3

RESEARCH METHODOLOGY

3.1. Research Design

This research is design into 4 stages, in the beginning will discuss about background of this research to identify problem. After the problem identified, research objective collected and packaged into several question for this research. In the second step is establishing a conceptual framework that will be a guide in finding solutions.

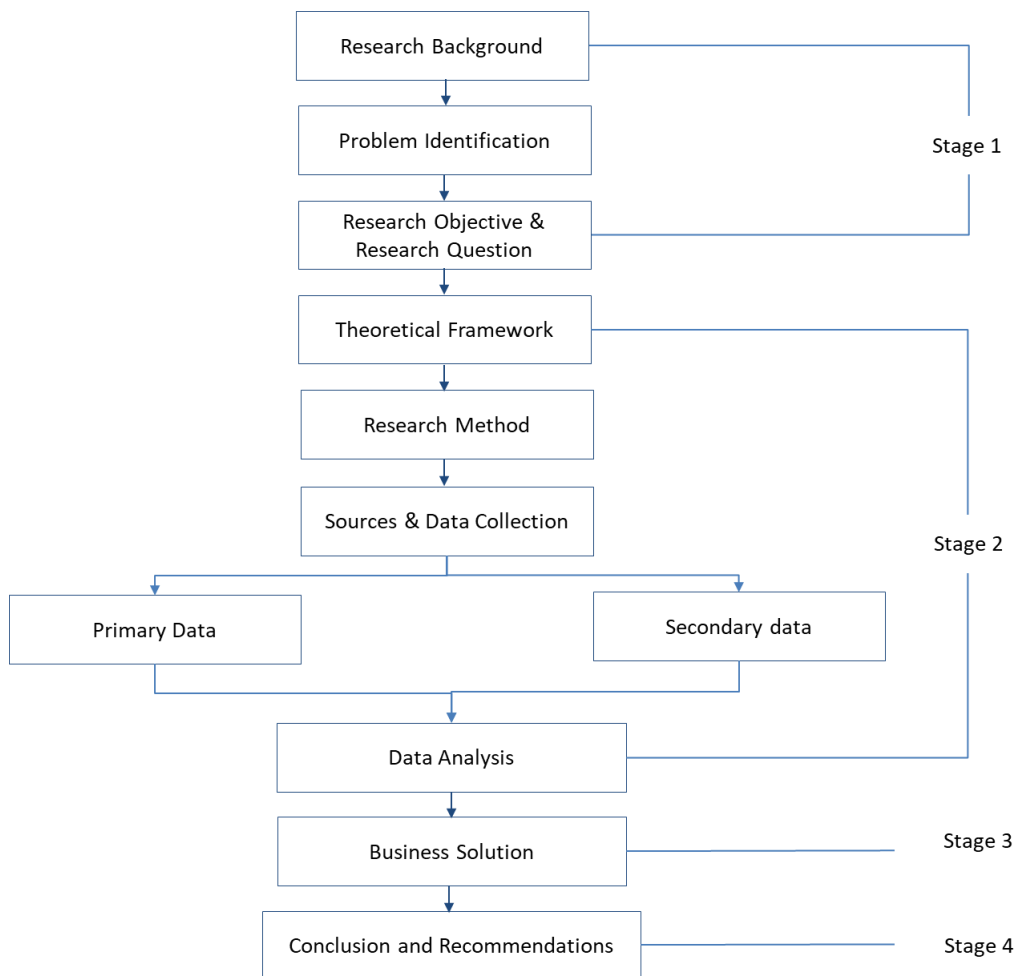


Figure 3.1. Research design Process Framework

(Source: Author Analysis)

The method that used in this research is quantitative and data acquisition as mostly taken from the company's internal secondary data and some primary data obtained by interview with several experts and management at PKT.

After obtaining all supporting data, in the next stage is carried out analysis, find out a business solution which will then concludes the result of this analysis and provide recommendations.

3.2 Data Collection Method

This research uses primary data and secondary data. Primary data obtained by interview with several experts and management at PKT are appropriate to the contextual problem. Secondary data were collected from several source such as reports, books, journals, articles, and websites. Moreover, the author also gets secondary data from the company annual and financial report. Both data primary and secondary data consist of quantitative and qualitative information.

3.3 Data Analysis Method

The collected primary and secondary data will be analysis by internal and external analysis and then used as inputs for financial analysis to calculate financial projections and financial model. A financial model simulation was developed using a Microsoft Excel spreadsheet to analyze the information.

Projected cash flows for each scenario will be generated by the financial model. Utilizing these cash flow projections, various capital budgeting techniques including NPV, IRR, PI, and Discounted Payback Period will be applied. The results obtained from these calculations will be compared across the different scenarios that have been developed

CHAPTER 4

BUSINESS SOLUTION

The business solution for this project will be carried out for 2 alternative solutions between purchase or rent. This chapter will explain detail calculation for investment project analysis, propose business solution, sensitivity analysis and risk management.

4.1 Defining Assumptions

This research applies several assumptions that have been set by company or agreements between companies and business partners. Its serves as a guide to performing the financial calculation. This assumption obtained from secondary data such as expert suggestion, contract agreement, report and historical data in this company.

4.1.1 Financial Analysis Assumption

To calculate the required investment value, data is needed to support calculations in finding the Net Present Value (NPV), Internal Rate of Return (IRR) and Discounted Payback Period. Tha data can be seen in table below:

Table 4.1. Financial Analysis Assumption
(Source: Company's Data)

No	Description	Value	Source
1	Initial Investment	Rp. 9.238.900.000	Company's data
2	Annual Rent Cost	Rp. 1.310.445.162	Company's data
3	Revenue and Operating Cost	Calculated	Company's data
4	Inflation rate avg	4,38%	Calculate from OJK 2023 Last 17 th Months
5	Project Duration	10 Years	Company's data, with assumption
6	Cost and Sales	Following inflation rate	Company's data and process data.

7	WACC	10,5%	Company's data
8	Tax Rate	22%	Company's data
9	Manpower Merit Performance / Year (avg)	4,38%	Company's data & Inflation
10	Depreciation Period	10 Year	Company's data
11	Salvage Value end Period	40%	Company's data

4.1.2 Capital Expenditure (CAPEX)

Capital expenditure in this project will describe in 2 options, Purchase or Rent. Total investment of purchase New Fire Truck in PKT is **Rp. 9.238.900.000**, - for capital expenditure which consist of New Unit, Mobilization, Rotary Lamp, Communication installation, Foam Installation and Training. The breakdown cost for this Capex can be seen in the table below.

Table 4.2 Project Capital Expenditure Purchase Option
Source: Company's data

New Aerial Fire Truck Purchase			Value
1.	Unit Price	Rp	8.120.000.000
2.	Mobilization	Rp	100.000.000
3.	Rotary Lamp	Rp	10.000.000
4.	Communication installation	Rp	12.000.000
5.	Foam installation	Rp	22.000.000
6.	Training	Rp	135.000.000
7.	Total	Rp	8.399.000.000
8.	PPN 10%	Rp	839.900.000
Installed Cost of New Asset			Rp 9.238.900.000

For Rent option, Total initial investment is **Rp. 1.699.989.678**. The **breakdown** cost for this Rent Option can be seen in the table below.

Table 4.3 Project Capital Expenditure Purchase Option
Source: Company's data

Aerial Fire Truck Rent			Value
1.	Capital Cost (Rent)/ Year -1	Rp	1.310.445.162
2.	Mobilization	Rp	100.000.000
3.	Rotary Lamp	Rp	-
4.	Communication installation	Rp	-
5.	Foam installation	Rp	-
6.	Training	Rp	135.000.000
7.	Total	Rp	1.545.445.162
8.	PPN 10%	Rp	154.544.516
Initial Cost of New Rent Asset			Rp 1.699.989.678

4.1.3 Depreciation of Assets

The Depreciation for this New Aerial Fire Truck Project will be using straight line depreciation method for 10 Years of estimate economic life. Refers to the company historical data. Salvage value for 10 Years useful is 40% from cost of new asset, salvage value will be Rp. 3.695.000.000, - The Depreciation projection schedule for the investment project shows in the following table.

Table 4.4 Depreciation Table

Period	Year	Book Value (Rp)	Depreciation Expense (Rp)	Accumulated Depreciation (Rp)
0	2023	9.238.900.000		
1	2024	8.684.566.000	554.334.000	554.334.000
2	2025	8.130.232.000	554.334.000	1.108.668.000
3	2026	7.575.898.000	554.334.000	1.663.002.000
4	2027	7.021.564.000	554.334.000	2.217.336.000
5	2028	6.467.230.000	554.334.000	2.771.670.000
6	2029	5.912.896.000	554.334.000	3.326.004.000
7	2030	5.358.562.000	554.334.000	3.880.338.000
8	2031	4.804.228.000	554.334.000	4.434.672.000
9	2032	4.249.894.000	554.334.000	4.989.006.000
10	2033	3.695.560.000	554.334.000	5.543.340.000

4.1.4 Weighted – Average Cost of Capital (WACC)

PKT is not listed company, the calculation of weighted average cost of capital for New Aerial Fire Truck in PKT is **10,5%**, this value is obtained from the company's internal data which will be used as the discount rate to calculate the investment analysis.

4.1.5 Operation Expenditure (OPEX)

There are 2 option in calculating Operation Expenditure (OPEX) for the New Aerial Fire Truck Project, the option are Purchase or Rent. It will use the following Assumption:

7. Maintenance cost obtained from estimate calculation which the inflation rate will be added every year.
8. Insurance cost all risk that used in this project using annual Premi 1% from book value of new unit aerial fire truck including depreciation. So, every year its value will decrease.
9. Fuel consumption of New Aerial Fire truck is calculate based on historical data activity in company which fuel inflation rate will be added 2,1% every year.
10. Consumable Good of New Fire truck project consist of replace the foam liquid periodically and the cost based on company info and will be increase every year refer to the inflation rate.
11. Annual Rent Price will calculate if using Option "Rent" and the value remains according to the contract 10 years agreement.
12. Employee salaries included in the existing operating cost calculation which will be added a merit increase value equal to the inflation rate 4,38%.
13. Existing Operating cost has been set as sharing costs, and 50% will be covered by PKT will be charged to the client as operating cost.

Table 4.5 Cost of Operating Purchase Option

Operating Cost	1	2	3	4	5
New Fire Truck					
Maintenance Cost	Rp 8.500.000	Rp 8.872.300	Rp 9.260.907	Rp 9.666.534	Rp
Insurance all risk	Rp 87.845.660	Rp 82.302.320	Rp 76.758.980	Rp 71.215.640	
Fuel New FT	Rp 47.943.500	Rp 48.943.900	Rp 49.965.174	Rp 51.0	
Consumable Good	Rp 15.000.000	Rp 15.657.000	Rp 16.342.777	Rp	
Depreciation New FT	Rp 554.334.000	Rp 554.334.000	Rp 554.334.000	Rp	
Total Operating Cost of New FT	Rp 713.623.160	Rp 710.109.520	Rp 706.661		
Existing					
Sallary and Wages	Rp 7.096.712.696	Rp 7.407.548.7			
Vehicle Rent	Rp 58.000.000	Rp 5			
Fuel	Rp 201.742.453	Rp			
Maintenance	Rp 1.283.874.000				
Fire Water Supply	Rp 234.8				
Depreciation Existing Assumed for 5 years	Rp				
Existing Operating Cost					
Sharing 50% Operating C					
Total Shar new					
Operating Cost	6	7	8	9	10
New Fire Truck					
Maintenance Cost	Rp 10.531.868	Rp 10.993.163	Rp 11.474.664	Rp 11.977.254	Rp 12.501.858
Insurance all risk	Rp 60.128.960	Rp 54.585.620	Rp 49.042.280	Rp 43.498.940	Rp -
Fuel New FT	Rp 53.158.646	Rp 54.267.866	Rp 55.400.231	Rp 56.556.225	Rp 57.736.340
Consumable Good	Rp 18.585.649	Rp 19.399.700	Rp 20.249.407	Rp 21.136.331	Rp 22.062.102
Depreciation New FT	Rp 554.334.000	Rp 554.334.000	Rp 554.334.000	Rp 554.334.000	
Total Operating Cost of New FT	Rp 696.739.122	Rp 693.580.349	Rp 690.500.582	Rp 687.502.750	Rp 92.300.300
Existing					
Sallary and Wages	Rp 8.793.133.892	Rp 9.178.273.157	Rp 9.580.281.521	Rp 9.999.897.851	Rp 10.437.893.377
Vehicle Rent	Rp 68.161.600	Rp 68.161.600	Rp 68.161.600	Rp 68.161.600	Rp 68.161.600
Fuel	Rp 223.833.975	Rp 228.534.489	Rp 233.333.713	Rp 238.233.721	Rp 243.236.629
Maintenance	Rp 1.590.775.401	Rp 1.660.451.363	Rp 1.733.179.133	Rp 1.809.092.379	Rp 1.888.330.625
Fire Water Supply	Rp 290.995.500	Rp 303.741.103	Rp 317.044.963	Rp 330.931.533	Rp 345.426.334
Depreciation Existing Assumed for 5 years	Rp -	Rp -	Rp -	Rp -	Rp -
Existing Operating Cost	Rp 10.966.900.368	Rp 11.439.161.711	Rp 11.932.000.930	Rp 12.446.317.084	Rp 12.983.048.565
Sharing 50% Operating Cost	Rp 5.483.450.184	Rp 5.719.580.856	Rp 5.966.000.465	Rp 6.223.158.542	Rp 6.491.524.283
Total Sharing Exist Operation Cost + new Fire Truck Operating Cost	Rp 6.180.189.306	Rp 6.413.161.205	Rp 6.656.501.047	Rp 6.910.661.292	Rp 6.583.824.582

Table 4.6 Cost of Operating Rent Option

Operating Cost	1	2	3	4	5
Rent FT					
Biaya Sewa	Rp 1.310.445.162	Rp 1.310.445.162	Rp 1.310.445.162	Rp 1.310.445.162	Rp 1.310.445.162
Maintenance Cost	Rp -	Rp -	Rp -	Rp -	Rp -
Insurance	Rp -	Rp -	Rp -	Rp -	Rp -
Fuel New FT	Rp 47.943.500	Rp 48.943.900	Rp 49.965.174	Rp 51.007.759	Rp 52.072.098
Consumable Good	Rp 15.000.000	Rp 15.657.000	Rp 16.342.777	Rp 17.058.590	Rp 17.805.756
Depreciation New FT	Rp -	Rp -	Rp -	Rp -	Rp -
Total Operating Cost of New FT	Rp 1.373.388.662	Rp 1.375.046.062	Rp 1.376.753.113	Rp 1.378.511.511	Rp 1.380.323.016
Existing					
Sallary and Wages	Rp 7.096.712.696	Rp 7.407.548.712	Rp 7.731.999.346	Rp 8.070.660.917	Rp 8.424.155.865
Vehicle Rent	Rp 58.000.000	Rp 58.000.000	Rp 58.000.000	Rp 58.000.000	Rp 68.161.600
Fuel	Rp 201.742.453	Rp 205.979.045	Rp 210.304.604	Rp 214.721.001	Rp 219.230.142
Maintenance	Rp 1.283.874.000	Rp 1.340.107.681	Rp 1.398.804.398	Rp 1.460.072.030	Rp 1.524.023.185
Fire Water Supply	Rp 234.855.000	Rp 245.141.649	Rp 255.878.853	Rp 267.086.347	Rp 278.784.729
Depreciation Existing Assumsinya habis dalam 5 tahun	Rp 237.078.000	Rp 237.078.000	Rp 237.078.000	Rp 237.078.000	Rp -
Existing Operating Cost	Rp 9.112.262.149	Rp 9.493.855.087	Rp 9.892.065.201	Rp 10.307.618.295	Rp 10.514.355.522
Sharing 50% Operating Cost	Rp 4.556.131.075	Rp 4.746.927.543	Rp 4.946.032.600	Rp 5.153.809.148	Rp 5.257.177.761
Total Sharing Exist Operation Cost + new Fire Truck Operating Cost	Rp 5.929.519.737	Rp 6.121.973.605	Rp 6.322.785.713	Rp 6.532.320.659	Rp 6.637.500.777

Operating Cost	6	7	8	9	10
Rent FT					
Biaya Sewa	Rp 1.310.445.162	Rp 1.310.445.162	Rp 1.310.445.162	Rp 1.310.445.162	Rp 1.310.445.162
Maintenance Cost	Rp -	Rp -	Rp -	Rp -	Rp -
Insurance	Rp -	Rp -	Rp -	Rp -	Rp -
Fuel New FT	Rp 53.158.646	Rp 54.267.866	Rp 55.400.231	Rp 56.556.225	Rp 57.736.340
Consumable Good	Rp 18.585.649	Rp 19.399.700	Rp 20.249.407	Rp 21.136.331	Rp 22.062.102
Depreciation New FT	Rp -	Rp -	Rp -	Rp -	Rp -
Total Operating Cost of New FT	Rp 1.382.189.457	Rp 1.384.112.728	Rp 1.386.094.800	Rp 1.388.137.718	Rp 1.390.243.604
Existing					
Salary and Wages	Rp 8.793.133.892	Rp 9.178.273.157	Rp 9.580.281.521	Rp 9.999.897.851	Rp 10.437.893.377
Vehicle Rent	Rp 68.161.600	Rp 68.161.600	Rp 68.161.600	Rp 68.161.600	Rp 68.161.600
Fuel	Rp 223.833.975	Rp 228.534.489	Rp 233.333.713	Rp 238.233.721	Rp 243.236.629
Maintenance	Rp 1.590.775.401	Rp 1.660.451.363	Rp 1.733.179.133	Rp 1.809.092.379	Rp 1.888.330.625
Fire Water Supply	Rp 290.995.500	Rp 303.741.103	Rp 317.044.963	Rp 330.931.533	Rp 345.426.334
Depreciation Existing	Rp -	Rp -	Rp -	Rp -	Rp -
Assumsinya habis dalam 5 tahun					
Existing Operating Cost	Rp 10.966.900.368	Rp 11.439.161.711	Rp 11.932.000.930	Rp 12.446.317.084	Rp 12.983.048.565
Sharing 50% Operating Cost	Rp 5.483.450.184	Rp 5.719.580.856	Rp 5.966.000.465	Rp 6.223.158.542	Rp 6.491.524.283
Total Sharing Exist Operation Cost + new Fire Truck Operating Cost	Rp 6.865.639.641	Rp 7.103.693.584	Rp 7.352.095.265	Rp 7.611.296.260	Rp 7.881.767.887

4.1.6 Projected Revenue Calculation

Project revenue in this project consist of Emergency Response Services, Cargo Emergency Standby and Fire & Rescue Training Services. The main revenue in this project is Emergency Response Services. These services include industrial accident such as fire, explosion and toxic release. The client is a company in PKT industrial complex which they don't have emergency response facility in their plant. They pay annual fee to PKT which will be increase following the inflation rate. Currently, PKT have 4 clients consist of PT. Kaltim Nitrate Indonesia (PT.KNI), PT Kaltim Methanol Industry (PT. KMI), PT. Kaltim Daya Mandiri (PT. KDM), PT. Kaltim Parna Industry (PT. KPI).

Table 4.7 Annual Fee of Emergency Response 10 Years Projection.

Year	0	1	2	3	4
Emergency Response Services					
Client	Annual Fee 2023	2024	2025	2026	2027
PT. KNI	Rp 1.587.732.000	Rp 1.704.906.622	Rp 1.830.728.730	Rp 1.965.836.511	Rp 2.110.915.245
PT. KMI	Rp 1.106.815.000	Rp 1.188.497.947	Rp 1.276.209.095	Rp 1.370.393.327	Rp 1.471.528.354
PT. KDM	Rp 382.815.000	Rp 411.066.747	Rp 441.403.473	Rp 473.979.049	Rp 508.958.703
PT. KPI	Rp 1.321.300.000	Rp 1.418.811.940	Rp 1.523.520.261	Rp 1.635.956.056	Rp 1.756.689.613
Total	Rp 4.398.662.000	Rp 4.723.283.256	Rp 5.071.861.560	Rp 5.446.164.943	Rp 5.848.091.916

Year	5	6	7	8	9	10
Emergency Response Services						
Client	2028	2029	2030	2031	2032	2033
PT. KNI	Rp 2.266.700.790	Rp 2.433.983.308	Rp 2.613.611.277	Rp 2.806.495.789	Rp 3.013.615.178	Rp 3.236.019.978
PT. KMI	Rp 1.580.127.147	Rp 1.696.740.530	Rp 1.821.959.981	Rp 1.956.420.628	Rp 2.100.804.470	Rp 2.255.843.840
PT. KDM	Rp 546.519.855	Rp 586.853.021	Rp 630.162.774	Rp 676.668.786	Rp 726.606.943	Rp 780.230.535
PT. KPI	Rp 1.886.333.307	Rp 2.025.544.705	Rp 2.175.029.904	Rp 2.335.547.111	Rp 2.507.910.488	Rp 2.692.994.282
Total	Rp 6.279.681.099	Rp 6.743.121.564	Rp 7.240.763.936	Rp 7.775.132.314	Rp 8.348.937.079	Rp 8.965.088.635

Cargo emergency standby is a standby service for handling emergencies during the ammonia shipment process by the client. The Client who uses

this service is PT. KPI. This service set a fee of Rp. 11.200.000 / cargo activity and an average of 35 times a year. The activity cost will be increased following the inflation rate every year,

Table 4.8 Cargo Emergency Standby 10 Years Projection.

Year		0	1	2	3	4
Cargo Emergency Standby						
Freq/ Tahun		35				
Unit Price	Rp	11.200.000	Rp 12.026.560	Rp 12.914.120	Rp 13.867.182	Rp 14.890.580
Cash in	Rp	392.000.000	Rp 420.929.600	Rp 451.994.204	Rp 485.351.377	Rp 521.170.308

Year		5	6	7	8	9	10
Cargo Emergency Standby							
Freq/ Tahun							
Unit Price	Rp	15.989.505	Rp 17.169.531	Rp 18.436.642	Rp 19.797.266	Rp 21.258.304	Rp 22.827.167
Cash in	Rp	559.632.677	Rp 600.933.569	Rp 645.282.466	Rp 692.904.312	Rp 744.040.650	Rp 798.950.850

Fire and Rescue training also carried out by Joint venture company; they pay Rp. 15.000.000 / activity and average are 6 times in a year. The activity cost will increase following the inflation rate every year.

Table 4.9 Training Fire and Rescue Services 10 Years Projection.

Year		0	1	2	3	4
Training Fire & Rescue Services						
Freq/ Tahun		6				
Unit Price		15.000.000				
Cash in	Rp	90.000.000	Rp 96.642.000	Rp 103.774.180	Rp 111.432.714	Rp 119.656.448

Year		5	6	7	8	9	10
Training Fire & Rescue Services							
Freq/ Tahun							
Unit Price							
Cash in	Rp	128.487.094	Rp 137.969.442	Rp 148.151.587	Rp 159.085.174	Rp 170.825.660	Rp 183.432.593

4.2 Financial Projection

After calculating projected cost and revenue. The next is to find out the discounted cash flow that projected for the next 10 years. After these calculations are carried out and than Net Present Value (NPV), Internal Rate Return (IRR) and Discounted Payback Period values are calculated using a discount rate of 10,5%.

Table 4.10 Operational Expenditure, Revenue, Net Cash Flow and Future Cash Flow 10 Years Projection (Purchase Option)

Operating Cost	0	1	2	3	4	
New Fire Truck						
Maintenance Cost		Rp 8.500.000	Rp 8.872.300	Rp 9.260.907	Rp 9.666.534	
Insurance all risk	Rp 93.389.000	Rp 87.845.660	Rp 82.302.320	Rp 76.758.980	Rp 71.215.640	
Fuel New FT		Rp 47.943.500	Rp 48.943.900	Rp 49.965.174	Rp 51.007.759	
Consumable Good		Rp 15.000.000	Rp 15.657.000	Rp 16.342.777	Rp 17.058.590	
Depreciation New FT		Rp 554.334.000	Rp 554.334.000	Rp 554.334.000	Rp 554.334.000	
Total Operating Cost of New FT		Rp 713.623.160	Rp 710.109.520	Rp 706.661.837	Rp 703.282.523	
Existing						
Sallary and Wages	Rp 6.798.920.000	Rp 7.096.712.696	Rp 7.407.548.712	Rp 7.731.999.346	Rp 8.070.660.917	
Vehicle Rent	Rp 58.000.000	Rp 58.000.000	Rp 58.000.000	Rp 58.000.000	Rp 58.000.000	
Fuel	Rp 197.593.000	Rp 201.742.453	Rp 205.979.045	Rp 210.304.604	Rp 214.721.001	
Maintenance	Rp 1.230.000.000	Rp 1.283.874.000	Rp 1.340.107.681	Rp 1.398.804.398	Rp 1.460.072.030	
Fire Water Supply	Rp 225.000.000	Rp 234.855.000	Rp 245.141.649	Rp 255.878.853	Rp 267.086.347	
Depreciation Existing Assumed for 5 years	Rp 237.078.000	Rp 237.078.000	Rp 237.078.000	Rp 237.078.000	Rp 237.078.000	
Existing Operating Cost	Rp 8.746.591.000	Rp 9.112.262.149	Rp 9.493.855.087	Rp 9.892.065.201	Rp 10.307.618.295	
Sharing 50% Operating Cost	Rp 4.373.295.500	Rp 4.556.131.075	Rp 4.746.927.543	Rp 4.946.032.600	Rp 5.153.809.148	
Operating Cost	0	1	2	3	4	
Total Sharing Exist Operation Cost + new Fire Truck Operating Cost		Rp 5.269.754.235	Rp 5.457.037.063	Rp 5.652.694.438	Rp 5.857.091.671	
Revenue	0	1	2	3	4	
Sales	Rp 4.880.662.000	Rp 5.240.854.856	Rp 5.627.629.944	Rp 6.042.949.034	Rp 6.488.918.673	
Operating Profit/Loss		-Rp 28.899.379	Rp 170.592.881	Rp 390.254.596	Rp 631.827.002	
Income Tax		Rp -	Rp 37.530.434	Rp 85.856.011	Rp 139.001.940	
Net Earnings /loss (NOPAT)		-Rp 28.899.379	Rp 133.062.447	Rp 304.398.585	Rp 492.825.061	
New FT Salvage after Tax						
OCF (Add Back Depre)		Rp 762.512.621	Rp 924.474.447	Rp 1.095.810.585	Rp 1.284.237.061	
Discount Rate PKT	10,5%					
Initial Investment	-Rp 9.238.900.000					
FCF		Rp 762.512.621	Rp 924.474.447	Rp 1.095.810.585	Rp 1.284.237.061	
Net Cash Flow		-Rp 8.476.387.379	-Rp 7.551.912.932	-Rp 6.456.102.347	-Rp 5.171.865.286	
Discounted Factors		0,905	0,819	0,741	0,671	
Net Cash Flow (Discounted)	-Rp 9.238.900.000	Rp 690.056.671	Rp 757.129.827	Rp 812.173.205	Rp 861.382.584	
Accumulated Discounted PBP	-Rp 9.238.900.000	-Rp 8.548.843.329	-Rp 7.791.713.502	-Rp 6.979.540.298	-Rp 6.118.157.713	
Operating Cost	5	6	7	8	9	10
New Fire Truck						
Maintenance Cost	Rp 10.089.929	Rp 10.531.868	Rp 10.993.163	Rp 11.474.664	Rp 11.977.254	Rp 12.501.858
Insurance all risk	Rp 65.672.300	Rp 60.128.960	Rp 54.585.620	Rp 49.042.280	Rp 43.498.940	Rp -
Fuel New FT	Rp 52.072.098	Rp 53.158.646	Rp 54.267.866	Rp 55.400.231	Rp 56.556.225	Rp 57.736.340
Consumable Good	Rp 17.805.756	Rp 18.585.649	Rp 19.399.700	Rp 20.249.407	Rp 21.136.331	Rp 22.062.102
Depreciation New FT	Rp 554.334.000	Rp 554.334.000	Rp 554.334.000	Rp 554.334.000	Rp 554.334.000	Rp 554.334.000
Total Operating Cost of New FT	Rp 699.974.083	Rp 696.739.122	Rp 693.580.349	Rp 690.500.582	Rp 687.502.750	Rp 92.300.300
Existing						
Sallary and Wages	Rp 8.424.155.865	Rp 8.793.133.892	Rp 9.178.273.157	Rp 9.580.281.521	Rp 9.999.897.851	Rp 10.437.893.377
Vehicle Rent	Rp 68.161.600	Rp 68.161.600	Rp 68.161.600	Rp 68.161.600	Rp 68.161.600	Rp 68.161.600
Fuel	Rp 219.230.142	Rp 223.833.975	Rp 228.534.489	Rp 233.333.713	Rp 238.233.721	Rp 243.236.629
Maintenance	Rp 1.524.023.185	Rp 1.590.775.401	Rp 1.660.451.363	Rp 1.733.179.133	Rp 1.809.092.379	Rp 1.888.330.625
Fire Water Supply	Rp 278.784.729	Rp 290.995.500	Rp 303.741.103	Rp 317.044.963	Rp 330.931.533	Rp 345.426.334
Depreciation Existing Assumed for 5 years	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -
Existing Operating Cost	Rp 10.514.355.522	Rp 10.966.900.368	Rp 11.439.161.711	Rp 11.932.000.930	Rp 12.446.317.084	Rp 12.983.048.565
Sharing 50% Operating Cost	Rp 5.257.177.761	Rp 5.483.450.184	Rp 5.719.580.856	Rp 5.966.000.465	Rp 6.223.158.542	Rp 6.491.524.283
Operating Cost	5	6	7	8	9	10
Total Sharing Exist Operation Cost + new Fire Truck Operating Cost	Rp 5.957.151.844	Rp 6.180.189.306	Rp 6.413.161.205	Rp 6.656.501.047	Rp 6.910.661.292	Rp 6.583.824.582
Revenue	5	6	7	8	9	10
Sales	Rp 6.967.800.871	Rp 7.482.024.575	Rp 8.034.197.988	Rp 8.627.121.800	Rp 9.263.803.389	Rp 9.947.472.079
Operating Profit/Loss	Rp 1.010.649.027	Rp 1.301.835.269	Rp 1.621.036.783	Rp 1.970.620.753	Rp 2.353.142.097	Rp 3.363.647.496
Income Tax	Rp 222.342.786	Rp 286.403.759	Rp 356.628.092	Rp 433.536.566	Rp 517.691.261	Rp 740.002.449
Net Earnings /loss (NOPAT)	Rp 788.306.241	Rp 1.015.431.510	Rp 1.264.408.691	Rp 1.537.084.187	Rp 1.835.450.835	Rp 2.623.645.047
New FT Salvage after Tax						Rp 3.326.004.000
OCF (Add Back Depre)	Rp 1.342.640.241	Rp 1.569.765.510	Rp 1.818.742.691	Rp 2.091.418.187	Rp 2.389.784.835	Rp 5.949.649.047
Discount Rate PKT						
Initial Investment						
FCF	Rp 1.342.640.241	Rp 1.569.765.510	Rp 1.818.742.691	Rp 2.091.418.187	Rp 2.389.784.835	Rp 5.949.649.047
Net Cash Flow	-Rp 3.829.225.045	-Rp 2.259.459.535	-Rp 440.716.844	Rp 1.650.701.343	Rp 4.040.486.178	Rp 9.990.135.226
Discounted Factors	0,607	0,549	0,497	0,450	0,407	0,368
Net Cash Flow (Discounted)	Rp 814.982.474	Rp 862.305.417	Rp 904.139.233	Rp 940.898.240	Rp 972.967.422	Rp 2.192.141.422
Accumulated Discounted PBP	-Rp 5.303.175.240	-Rp 4.440.869.822	-Rp 3.536.730.589	-Rp 2.595.832.349	-Rp 1.622.864.927	Rp 569.276.495

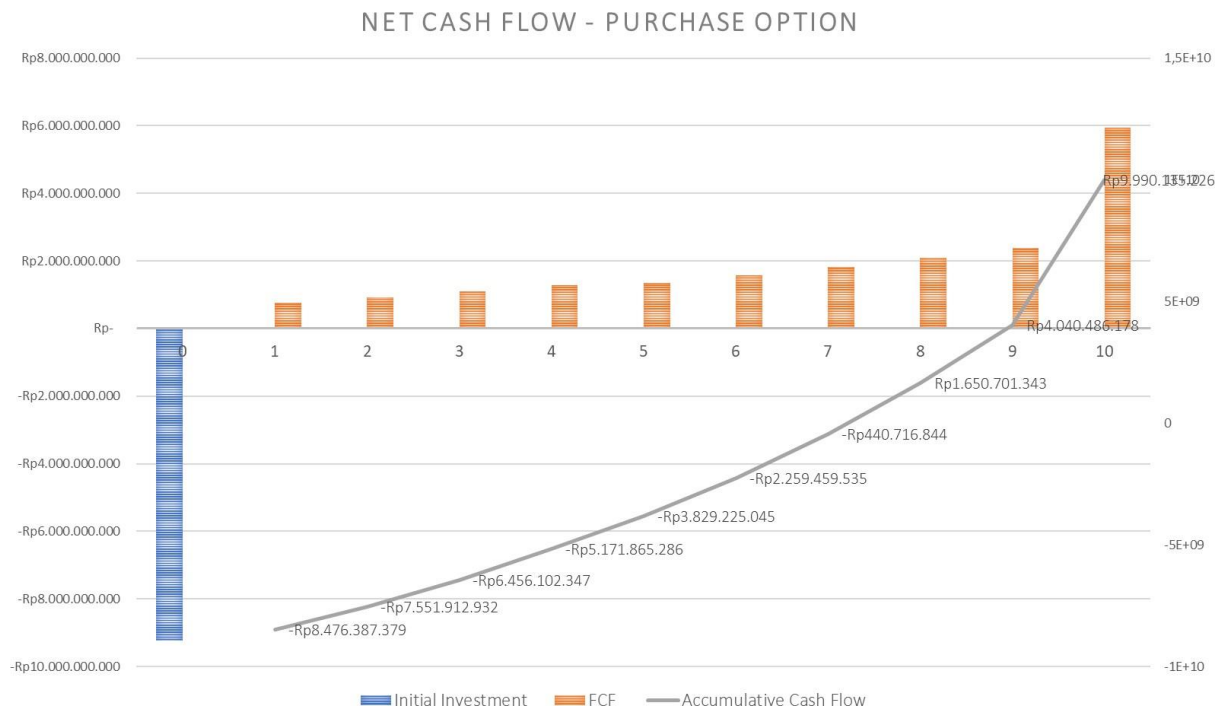


Figure 4.1 Net Cash Flow Chart –Purchase Option

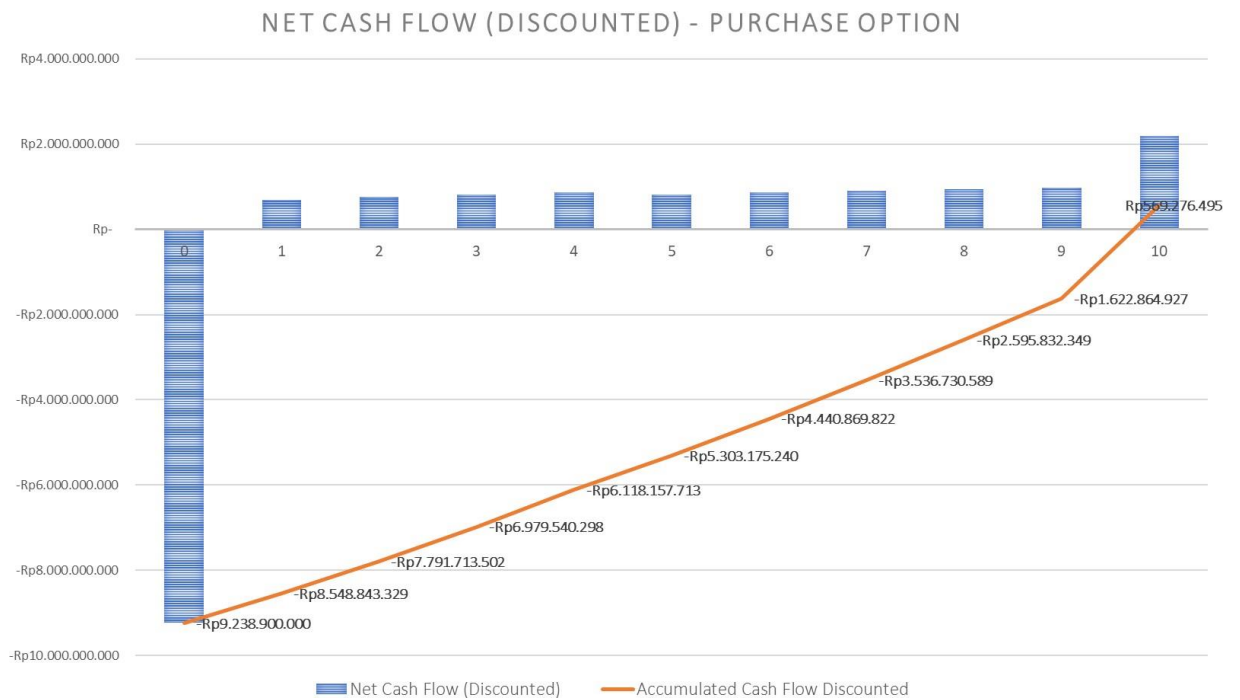


Figure 4.2 Net Cash Flow Chart (Discounted) –Purchase Option

The chart above shows that for 9 years, Commulative Cash flow is still in the mines position and has been positive after the 9th year.

Table 4.11 Operational Expenditure, Revenue, Net Cash Flow and Future Cash Flow 10 Years Projection (**Rent Option**)

Operating Cost	5	6	7	8	9	10
Rent FT						
Biaya Sewa	Rp 1.310.445.162	Rp 1.310.445.162	Rp 1.310.445.162	Rp 1.310.445.162	Rp 1.310.445.162	Rp 1.310.445.162
Maintenance Cost	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -
Insurance	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -
Fuel New FT	Rp 52.072.098	Rp 53.158.646	Rp 54.267.866	Rp 55.400.231	Rp 56.556.225	Rp 57.736.340
Consumable Good	Rp 17.805.756	Rp 18.585.649	Rp 19.399.700	Rp 20.249.407	Rp 21.136.331	Rp 22.062.102
Depreciation New FT	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -
Total Operating Cost of New FT	Rp 1.380.323.016	Rp 1.382.189.457	Rp 1.384.112.728	Rp 1.386.094.800	Rp 1.388.137.718	Rp 1.390.243.604
Existing						
Salary and Wages	Rp 8.424.155.865	Rp 8.793.133.892	Rp 9.178.273.157	Rp 9.580.281.521	Rp 9.999.897.851	Rp 10.437.893.377
Vehicle Rent	Rp 68.161.600	Rp 68.161.600	Rp 68.161.600	Rp 68.161.600	Rp 68.161.600	Rp 68.161.600
Fuel	Rp 219.230.142	Rp 223.833.975	Rp 228.534.489	Rp 233.333.713	Rp 238.233.721	Rp 243.236.629
Maintenance	Rp 1.524.023.185	Rp 1.590.775.401	Rp 1.660.451.363	Rp 1.733.179.133	Rp 1.809.092.379	Rp 1.888.330.625
Fire Water Supply	Rp 278.784.729	Rp 290.995.500	Rp 303.741.103	Rp 317.044.963	Rp 330.931.533	Rp 345.426.334
Depreciation Existing	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -
Assumsinya habis dalam 5 tahun	Rp -	Rp -	Rp -	Rp -	Rp -	Rp -
Existing Operating Cost	Rp 10.514.355.522	Rp 10.966.900.368	Rp 11.439.161.711	Rp 11.932.000.930	Rp 12.446.317.084	Rp 12.983.048.565
Sharing 50% Operating Cost	Rp 5.257.177.761	Rp 5.483.450.184	Rp 5.719.580.856	Rp 5.966.000.465	Rp 6.223.158.542	Rp 6.491.524.283
Total Sharing Exist Operation Cost + new Fire Truck Operating Cost	Rp 6.637.500.777	Rp 6.865.639.641	Rp 7.103.693.584	Rp 7.352.095.265	Rp 7.611.296.260	Rp 7.881.767.887
Revenue						
Sales	Rp 6.967.800.871	Rp 7.482.024.575	Rp 8.034.197.988	Rp 8.627.121.800	Rp 9.263.803.389	Rp 9.947.472.079
Operating Profit/Loss	Rp 330.300.093	Rp 616.384.934	Rp 930.504.405	Rp 1.275.026.535	Rp 1.652.507.129	Rp 2.065.704.192
Income Tax	Rp 72.666.021	Rp 135.604.686	Rp 204.710.969	Rp 280.505.838	Rp 363.551.568	Rp 454.454.922
Net Earnings /loss (NOPAT)	Rp 257.634.073	Rp 480.780.249	Rp 725.793.436	Rp 994.520.697	Rp 1.288.955.560	Rp 1.611.249.270
New FT Salvage after Tax						
OCF (Add Back Depre)	Rp 257.634.073	Rp 480.780.249	Rp 725.793.436	Rp 994.520.697	Rp 1.288.955.560	Rp 1.611.249.270
Discount Rate PKT						
Initial Investment						
FCF	Rp 257.634.073	Rp 480.780.249	Rp 725.793.436	Rp 994.520.697	Rp 1.288.955.560	Rp 1.611.249.270
Net Cash Flow	-Rp 2.000.290.814	-Rp 1.519.510.565	-Rp 793.717.130	Rp 200.803.567	Rp 1.489.759.128	Rp 3.101.008.398
Discounted Factors	0,607	0,549	0,497	0,450	0,407	0,368
Net Cash Flow (Discounted)	Rp 156.383.853	Rp 264.102.766	Rp 360.808.774	Rp 447.420.214	Rp 524.780.202	Rp 593.662.960
Accumulated Discounted PBP	-Rp 2.064.764.062	-Rp 1.800.661.296	-Rp 1.439.852.523	-Rp 992.432.308	-Rp 467.652.107	Rp 126.010.854

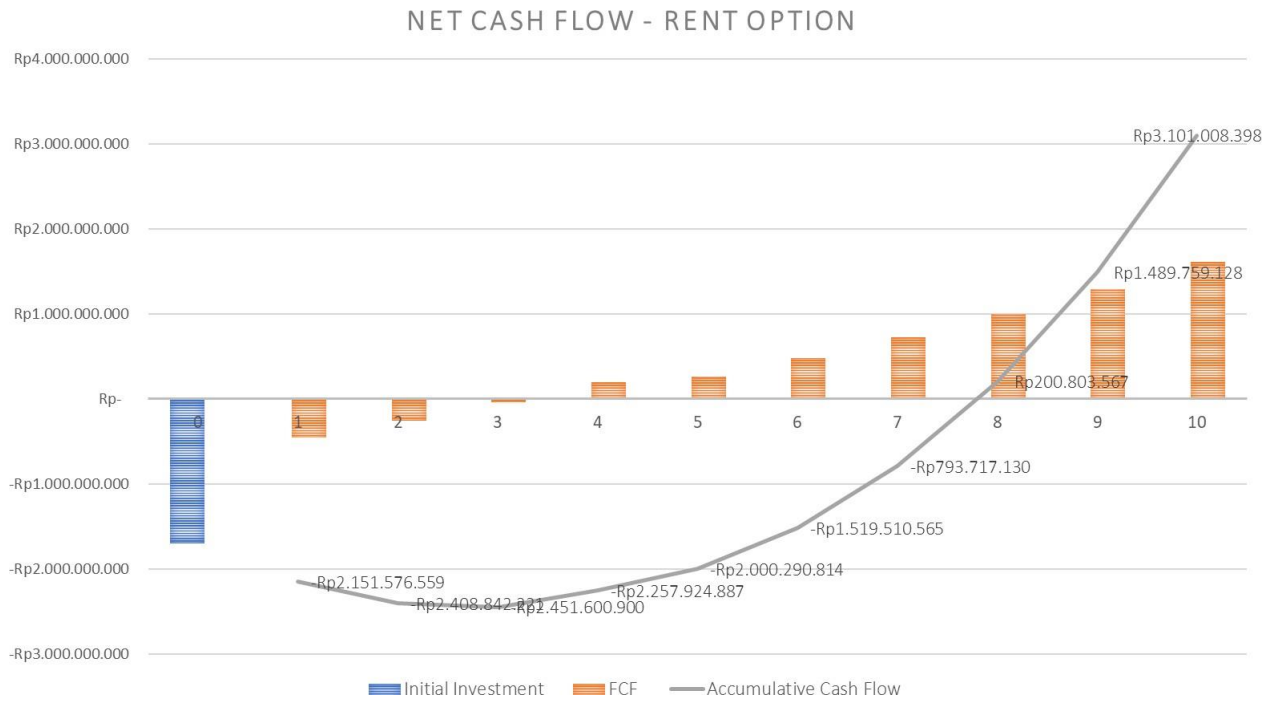


Figure 4.3 Net Cash Flow Chart – **Rent Option**

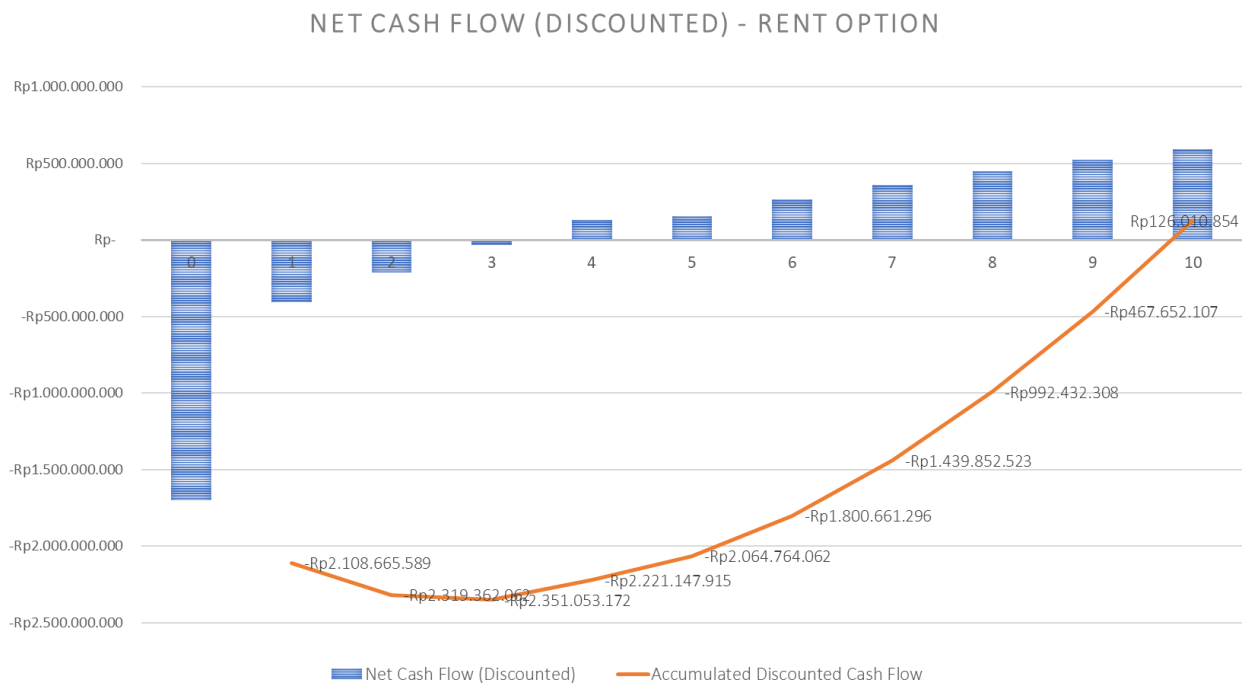


Figure 4.4 Net Cash Flow (Discounted) Chart – **Rent Option**

The chart above explains that the Net cash flow in the first 3 years is still minus, and then in the 4th year it starts to be positive which then slowly brings the accumulated Cash flow (Discounted) to be positive after the 9th year.

4.3 Financial Feasibility Analysis

The table below presents a comparison of the financial analysis between the Purchase and Rent options.

Table 4.12 Comparison Table Purchase Vs Rent

4.4 Analysis of Alternatives

Analysis financial has been carried out with feasible result. Based on the analysis above, the financial parameter comparison shown that Purchase option predicted have better economic value than Rent option. Purchase option provides a predicted NPV of Rp. 569.276.495, Internal rate of return of IRR 11,56 that more than 10,5 % of discount rate. The Discounted Payback Period 9,35 years for Purchase scenario. So, Purchase is the selected option for the provision of New Aerial fire truck. This research conducts sensitivity analysis to determine the impact of significant changes in variables on financial feasibility parameters.

4.5 Sensitivity Analysis

As mentioned previously in the conceptual framework, the sensitivity analysis will perform to testing which variable that have a significant impact to NPV performance. Sensitivity analysis by tornado chart shown that Annual fee of client or joint venture company is the most delicate variable influencing the project's financial performance, then followed by manpower Cost.

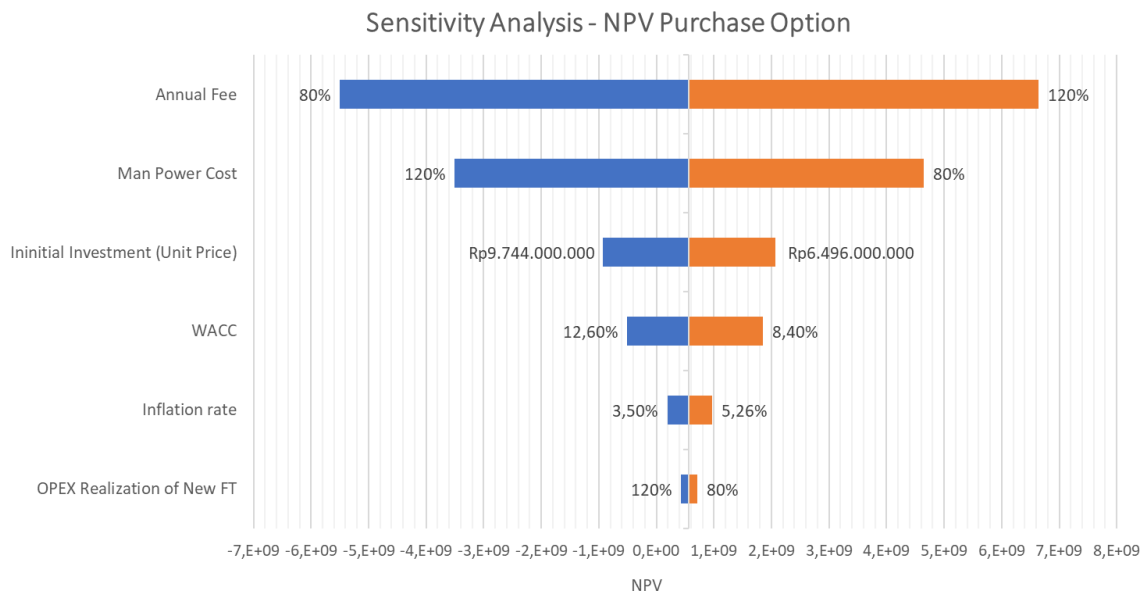


Figure 4.5 Sensitivity Analysis – **Purchase Option**

Based on Tornado Chart analysis above, the following result can be shown:

- If the Annual fee increased from each client increased by 20%, so the NPV has Increased significant to Rp. 6.639.013.466. And the other way if the annual fee has decrease by 20%. The NPV has decrease significant NPV to -Rp. 5.500.460.477
- If the cost of manpower has increased by 20%, so the NPV has decreased to -Rp. -3.500.609.667.
- In the New Fire Truck Unit price has in increased by 20%, NPV will going down to -Rp. 929.885.521 and if the unit price increases by 20%, then the NPV will be better to Rp. 2.068.438.511.
- If WACC or discounted factor has in increased by 20%, then the NPV Value was decrease to -Rp. 514.981.576
- If the inflation rate is going up to 120%, so the NPV also increase to Rp. 967.528.050. This can be happened because the annual fee paid by the client/joint venture company always increases every year following the inflation rate.

The spider chart also shows that the annual fee has a significant influence on NPV performance. This is followed by the company's annual fee.

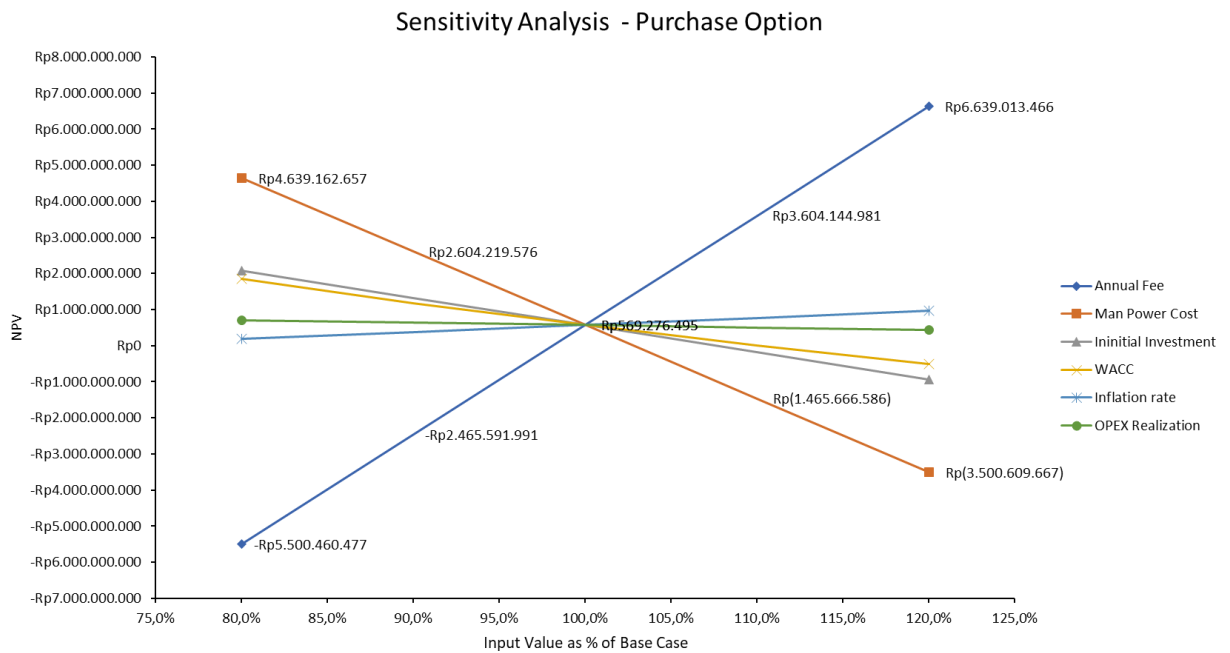


Figure 4.6 Spider Chart – **Purchase option.**

The other chart above is spider chart with X axis is NPV value dan Y axis is scenario input value. It has axis in the centre of chart, also shows the same perspective, the top variable that can be influence the NPV performance are annual fee and manpower cost.

4.6 Solution and Proposed Implementation Plan

From the financial analysis data above has been selected Purchase Option, and the variable that has significant impact to influence the NPV performance is Annual fee. So, the authors recommend if PKT want to improve financial performance. Then company can do an alternative to renegotiate to increase the annual fee for each client or looking for new client for increasing the revenue. While still taking into account the additional operating costs arising from additional clients. For the purchase of a new unit should be realized immediately, because this unit is a Completely Build Up (CBU), so that price increases that occur every year make the financial analysis calculated at this time potentially irrelevant in future years

CHAPTER 5

CONCLUSION AND RECOMMENDATION

4.7 Conclusion

1. Based on financial analysis result above, show that NPV and IRR of Purchase option is greater than Rent Option. NPV obtained Rp. 569.276.495 and Internal Rate of Return (IRR) has 11,56% still better than the WACC set by the company of 10,5%. So, Purchase is the selected option for the provision of New Aerial fire truck
2. According to the Sensitivity analysis by tornado chart and spider chart shown that Annual fee of client or joint venture company is the most delicate variable influencing the project's financial performance. If the Annual fee has increased from each client by 20%, so the NPV has Increased significant to Rp. 6.639.013.466. and the other way if the annual fee has decrease by 20%. The NPV has decrease significant NPV to -Rp. 5.500.460.477.

4.8 Recommendation

Based on the sensitivity analysis using tornado chart and spider chart, the two significant factors influencing the selected purchase option are the annual fee and manpower cost. Therefore, it is advisable to take necessary actions or further examination regarding these aspects:

1. Identification to anticipate increases in manpower costs and keep manpower costs under control. The increase in manpower costs must be accompanied by an increase in income.
2. Looking for opportunities to add clients, especially companies in the industrial complex that do not yet have MoU with PKT.
3. Maintain and carry out proper maintenance of the assets that are owned and always improve the competence of the fire man so that client trust is maintained.

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APPENDICES

Scenario Analysis - Sensitivity

Sensit 1.45, Only For Academic Use
Many Inputs, One Output
Single-Factor Sensitivity Analysis

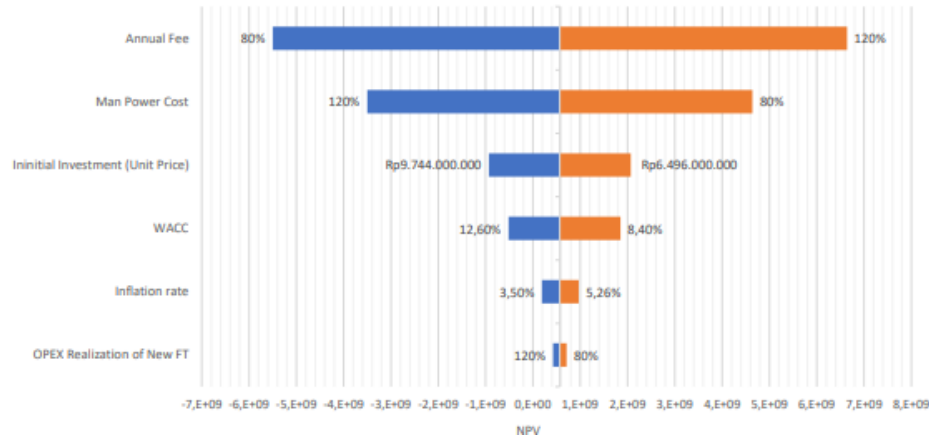
www.DecisionToolworks.com

Date 11-Jul-23
Time 1:59 AM

Workbook PKT hurdle Sensit New Dannels Calculation sheet 08.07.2023.xlsx
Output Cell 'Sensit Purchase 1'!\$F\$12

Input Variable	Corresponding Input Value			NPV Output Value			Percent	
	Low Output	Base Case	High Output	Low	Base	High	Swing	Swing*2
Annual Fee	80%	100%	120%	Rp 5.500.460.477	Rp 569.276.495	Rp 6.639.013.466	Rp 12.139.473.943	64,4%
Man Power Cost	120%	100%	80%	Rp 3.500.609.667	Rp 569.276.495	Rp 4.639.162.657	Rp 8.139.772.323	28,9%
Initial Investment (Unit Price)	Rp 9.744.000.000	Rp 8.120.000.000	Rp 6.496.000.000	-Rp 929.885.521	Rp 569.276.495	Rp 2.068.438.511	Rp 2.998.324.032	3,9%
WACC	12,60%	10,50%	8,40%	-Rp 514.981.576	Rp 569.276.495	Rp 1.849.521.458	Rp 2.364.503.034	2,4%
Inflation rate	3,50%	4,38%	5,26%	Rp 189.711.912	Rp 569.276.495	Rp 967.528.050	Rp 777.816.138	0,3%
OPEX Realization of	120%	100%	80%	Rp 427.233.624	Rp 569.276.495	Rp 711.319.365	Rp 284.085.741	0,0%

Sensitivity Analysis - NPV Purchase Option



Sensit 1.45, Only For Academic Use
Many Inputs, One Output
Single-Factor Sensitivity Analysis

www.DecisionToolworks.com

Date 11-Jul-23
Time 2:00 AM

Workbook PKT hurdle Sensit New Dannels Calculation sheet 08.07.2023.xlsx
Output Cell 'Sensit Purchase 1'!\$F\$12

Input Variable	Corresponding Input Value			Input Value as % of Base			NPV Output Value			Percent	
	Low Output	Base Case	High Output	Low %	Base %	High %	Low	Base	High	Swing	Swing*2
Annual Fee	80%	100%	120%	80,0%	100,0%	120,0%	-Rp 5.500.460.477	Rp 569.276.495	Rp 6.639.013.466	Rp 12.139.473.943	64,4%
Man Power Cost	120%	100%	80%	120,0%	100,0%	80,0%	-Rp 3.500.609.667	Rp 569.276.495	Rp 4.639.162.657	Rp 8.139.772.323	28,9%
Initial Investment	Rp 9.744.000.000	Rp 8.120.000.000	Rp 6.496.000.000	120,0%	100,0%	80,0%	-Rp 929.885.521	Rp 569.276.495	Rp 2.068.438.511	Rp 2.998.324.032	3,9%
WACC	12,60%	10,50%	8,40%	120,0%	100,0%	80,0%	-Rp 514.981.576	Rp 569.276.495	Rp 1.849.521.458	Rp 2.364.503.034	2,4%
Inflation rate	3,50%	4,38%	5,26%	80,0%	100,0%	120,0%	Rp 189.711.912	Rp 569.276.495	Rp 967.528.050	Rp 777.816.138	0,3%
OPEX Realization	120%	100%	80%	120,0%	100,0%	80,0%	Rp 427.233.624	Rp 569.276.495	Rp 711.319.365	Rp 284.085.741	0,0%

Sensitivity Analysis - Purchase Option

