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Financial Feasibility Analysis of Capacity Enhancement in Water Treatment Plants: A Case Study

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ABSTRACT:- PT XYZ, a major provider of clean water in Cilegon, faces increased demand due to population growth and industrial expansion, particularly in the petrochemical sector. To ensure a sustainable and reliable water supply, the Phase III Capacity Enhancement Project is proposed. This project aims to upgrade infrastructure, increase capacity, and improve the distribution network and Water Treatment Plant (WTP), along with enhancing mechanical, electrical, instrumentation, and automation (MEIA) facilities.A capital budgeting analysis was conducted to evaluate the financial feasibility of this project, considering Net Present Value (NPV), Modified Internal Rate of Return (MIRR), and Discounted Payback Period (DPP), using the Weighted Average Cost of Capital (WACC) as the discount rate.The analysis indicates the project is financially viable, showing positive financial returns and a payback period within the project's economic lifespan. These findings support the project's capacity to meet Cilegon's water demand sustainably.

KEYWORDS –Capital Budgeting, NPV, MIRR, DPP, WACC

I. INTRODUCTION

PT XYZ is a company that provides clean water in the Cilegon area and nearby places. Their vision is to be a top water provider in Indonesia, focusing on both industries and communities while prioritizing environmental sustainability. PT XYZ plans to achieve this vision through increased investment, particularly in providing water for industries. The company's purpose is to conduct business in the water management industry and optimize PT XYZ's resources to produce high-quality goods and/or services, ensuring competitiveness and aiming to generate profits to increase PT XYZ's value as a Limited Liability Company. To achieve these goals, PT XYZ focuses on water storage, purification, and distribution, raw water storage and distribution. As a water provider company in the Cilegon area, PT XYZ distributes water to industrial and domestic customers. The distribution area covers approximately 225 km² with an 80% market share in Cilegon. PT XYZ's distribution network includes five pump stations and various reservoir capacities to ensure efficient water supply.

In addition to its main activities, PT XYZ may engage in supporting activities to optimize its resources, either independently or in collaboration with others, in accordance with applicable laws and regulations. Due to the rising demand for clean water in Cilegon and nearby areas, PT XYZ receives numerous requests for water. In 2024, demand is expected to reach around 2,300 liters per second (lps), especially from companies like PT LCI, PT CA, PT NSI, and Perumda CM. However, the existing water treatment plant can only handle a maximum of 2,250 lps. To address this demand, PT XYZ intends to enhance its capacity through Phase III of the Investment Project, which includes improving capacity and distribution network, building a new Water Treatment Plant (WTP), enhancing the reliability of mechanical, electrical, instrumentation, and automation (MEIA) facilities

This study focuses on analyzing the capital budgeting of the Phase III capacity enhancement investment. It aims to assess incurred costs and determine the net cash flow generated by the project. The analysis will employ capital budgeting methods and the Discounted Cash Flow approach to evaluate the investment's feasibility.

II. LITERATURE REVIEW

2.1 Problem Exploration

The demand for clean water in the Cilegon area is rapidly increasing, with projections indicating a rise to 2,300 liters per second by 2024. The current Water Treatment Plant (WTP) can only handle up to 2,250 liters per second, necessitating the construction of a new WTP with a capacity of 600 liters per second, expansion of the distribution pipeline network, and enhancement of equipment reliability to ensure consistent water quality and supply.

2.2 Literature Review

1. Capital Budgeting

Capital budgeting, as defined by Zutter and Smart (2021), is the process of evaluating and selecting investments that create wealth for investors by being worth more than their cost. The capital budgeting process involves five steps: proposal generation, review and analysis, decision making, implementation, and follow-up. Several methods, including Net Present Value (NPV), Internal Rate of Return (IRR), Modified Internal Rate of Return (MIRR), and Discounted Payback Period, are used to determine the financial feasibility of capital investments.

2. Net Present Value (NPV)

NPV evaluates investment projects by calculating the difference between the present value of operating cash flows and the initial investment cost.
For investment proposals, the decision rule is:
- if the NPV is greater than Rp.0, accept the project;
- if it's less than Rp.0, reject the project.

A positive NPV means the present value of the project's benefits outweighs the present value of the project's costs.

3. Modified Internal Rate of Return (MIRR)

MIRR modifies project cash flows to ensure a single internal rate of return, making it a reliable measure for investment evaluation. Some considerations for using MIRR in this analysis are due to the following investment case conditions:
1. There is No Year 0

This type of investment involves capacity expansion where the investment is built within an existing plant system, allowing revenue from the new investment to be generated in the same year.
2. Cash flows during the economic lifetime of the investment alternates between positive and negative signs.

In year 1 and year 2, cash flow is negative due to investment expenditures.

According to (Zutter, Chad, J. and Scott B. Smart. , 2021.) : *The modified IRR transforms a project's cash flows by discounting all negative cash flows to the beginning of a project's life and compounding all positive cash flows to the end of the project's life. The rate used to discount or compound cash flows is the firm's cost of capital. This results in a single cash outflow at the beginning and a single cash inflow at the end. Those adjustments guarantee that there wil be a single IRR, which is called the modified IRR because the project's cash flows were modified before calculating the IRR.*

Based on this, calculating MIRR is necessary to avoid multiple IRRs and to determine the internal rate of return on this investment.
For investment proposals, the decision rule is:
- if the MIRR is greater than the WACC, accept the project.

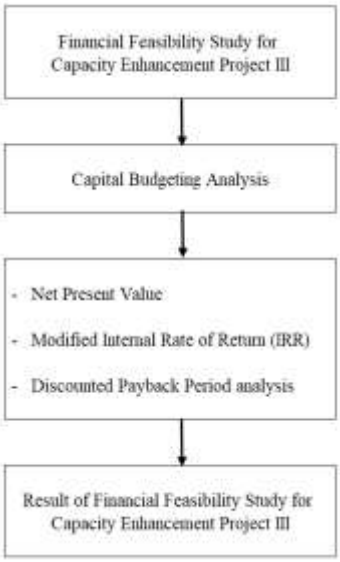
MIRR is the discount rate that results in a zero NPV. Therefore, if the WACC is lower than the MIRR, the NPV will be positive, which means that the project is financially feasible.
- if it is less than the WACC, reject the project.

4. Weighted Average Cost of Capital (WACC)

WACC is the average rate of return required by a firm's lenders and investors, considering the mix of debt and equity financing. It reflects the firm's cost of capital, adjusted for tax effects, and influences investment decisions based on the firm's risk profile.

2.3 Conceptual Framework

The conceptual framework for this study analyzes the financial feasibility of the Capacity Enhancement Project Phase III using capital budgeting methods.



Source : Writer's own work

Figure II. 1. Conceptual Framework

Key indicators include:

- Net Present Value (NPV): Measures project feasibility by comparing initial investment costs to the present value of future cash flows.
- Modified Internal Rate of Return (MIRR): Calculates the expected rate of return, ensuring NPV equals zero.
- Discounted Payback Period (DPP): Determines the time required to recover the initial investment from discounted cash flows.

III. RESEARCH METHODOLOGY

3.1. Data Collection

1. Type and Technique of Data Collection

Data collection focuses on specifying the types of data to be gathered, identifying data sources, and outlining data collection techniques. The study employs both primary and secondary data. Primary data includes financial records directly obtained from PT XYZ, such as financial statements and sales reports. Secondary data is sourced from existing publications, including industry reports and market data. The secondary data collection involves literature studies using both printed and digital materials.

Table 3.1 Data Collection Technique

Tools	Research Instrument Data Collection Techniques
Financial analysis : - NPV - MIRR - DPP - WACC	Secondary data: Study-desk

Source: Writer's own work

2. Defining Research Variables

- Net Present Value (NPV)

$$NPV = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} - CF_0$$

- NPV : Net Present Value
- CF_t : Cash Inflows in each period t

- r : Discounted rate
- CF0 : Initial Investment

- Modified Rate of Retun (MIRR)

$$\text{MIRR} = \sqrt[n]{FV(Positive\ cash\ flow\ x\ WACC)/PV(Negative\ cash\ flow\ x\ WACC)}\text{-1}$$

- WACC : Weighted Average Cost of Capital. In this formula, the finance rate is equal to the reinvestment rate and equal to the WACC.
- FV : Future value of positive cash flows at the WACC
- PV : Present value of negative cash flows at the WACC
- n : Numbered of periods

- Discounted Payback Period (DPB)

$$\text{DPB} \rightarrow \sum_{n=1}^{N} \frac{CF_n}{(1+r)^n} \equiv \sum_{n=1}^{N} \frac{I_n}{(1+r)^n} \equiv I_0$$

- DPB : Discounted Payback Period
- CFn (1+r)-n : Net discounted cash flow (net receipts) in n period
- r : Discounted rate

- Weighted Average Cost of Capital (WACC)

$$r_{wacc} = (w_d \times r_d)(1 - T) + (w_p \times r_p) + (w_s \times r_{sorn})$$

- rwacc : Weighted Average Cost of Capital
- wd : Proportion of long term debt in capital structure
- wp : Proportion of preferred stock in capital structure
- ws : Proportion of common stock equity in capital structure
- T : Corporate Tax Rate
- rd : Cost of Debt
- rp : Cost of Capital-Preferred Stock
- rp : Cost of Capital-Common Stock

3.2. Research Methodology

The research methodology involves the operationalization of research tools and the detailed methodology for data analysis. This includes defining how variables will be measured or observed and specifying the data analysis process to address the research questions. Financial feasibility is assessed using methods such as Net Present Value (NPV), Modified Internal Rate of Return (MIRR), and Discounted Payback Period (DPP).

3.3. Research Design

The research design determines how the research will be conducted, including the selection of qualitative or quantitative approaches, research paradigms, and the specification of research types, locations, time frames, and stages. A quantitative approach is used to gather and analyze internal company data from PT XYZ, focusing on financial tools to assess project feasibility. The primary tools include NPV, MIRR, DPP, and Weighted Average Cost of Capital (WACC), essential for evaluating the financial viability of the project.

IV. FINDINGS: BUSINESS SOLUTION

4.1 Financial Feasibility Analysis

1. Financial Component

Table 4. 1 Assumption

Depreciation Period	
Distribution Network	20 years
WTP	20 years
MEIO Facility	10 years
Amortization Period	
Project Supervision	5 years
Land Rent	5 years
Permit & legal	5 years
Social Cost	5 years
Insurance	5 years

Minimum Take or Pay	
Minimum Take or Pay Rate	75%
Cost of Debt Before Tax	
Cost of debt before tax	8.0%

Growth	
Growth for Revenue	2.50%
Growth for Operating Exp.	4%
Growth for Wages	7.5%

Investment Funding	
Debt	80%
Equity	20%
Corporate Income Tax	
Corporate tax rate	22%
Cost of Equity	
Risk Free Rate	6.49%
Beta	0.71
Market Return	10%
Cost of Equity	8.98%
WACC	
Cost of Equity	8.98%
Cost of Debt after Tax	6.24%
Weight of Equity	20%
Weight of Debt	80%
Total WACC	6.79%

Source : Writer's own work

2. Project Investment Cost

The assumptions outlined earlier are used to calculate the project investment cost for the capacity enhancement of a water treatment plant (600 liters per second) and its supporting investments. This calculation considers various cost estimation aspects necessary to execute the project in alignment with its objectives.

- Engineering, Procurement, Construction (EPC) Cost
  EPC costs cover design, materials, construction, labor, and other related expenses. Details include:
  - Distribution Network
  - Water Treatment Plant
  - Mechanical, Electrical, Instrumentation, and Automation (MEIA)

- Supporting Investment Cost
  Supporting investment costs are indirect expenses that support the project during its implementation.

- Interest During Construction (IDC)
  IDC represents the interest incurred on debt during the project's construction period, estimated at 8% per annum for a 2-year period.

- Total Investment Cost
  The total investment cost for the water treatment plant capacity enhancement project is Rp. 303,440,327,984.

Table 4.2 Investment Cost

No.	EPC Cost	Total
1	Distribution Network	46,620,000,000
2	WTP	164,280,000,000
3	MEIO Facility	48,840,000,000
	Total	259,740,000,000

No.	Supporting Investment Cost	Total
1	Project Supervision (3% EPC)	7,792,200,000
2	Land Rent (4.406 m2; Rp120.000/month)	2,863,718,064
3	Permit & legal (1.4% EPC)	3,636,360,000
4	Social Cost (0.5% EPC No.1 & 2)	1,687,200,000
5	Insurance (0.35% EPC)	909,090,000
	Total	16,888,568,064

Total EPC & Supporting Investment	276,628,568,064
Interest during construction (IDC)	26,811,759,920

Grand Total	**303,440,327,984**

Source : Writer's own work

- Project Timeline
  The project construction spans two years, from 2024 to 2025. The distribution network installation is completed first in 2024, allowing for the immediate supply of water and generation of revenue. Concurrently, the Water Treatment Plant (WTP) and Mechanical, Electrical, Instrumentation, and Automation (MEIA) are implemented over the two-year period, along with project supervision.

3. Revenue Projection

The revenue projection from the Water Treatment Plant (WTP) capacity enhancement project is based on additional water sales to three customers:

- PT LCI
  PT LCI, a new customer in the petrochemical industry, will build a factory requiring up to 305 liters per second (lps) of water, equivalent to 9,486,720 cubic meters (m^3) per year.
- PT CAP
  PT CAP, an existing customer in the petrochemical industry, plans to increase its production capacity, necessitating an additional 100 lps of water, equivalent to 3,110,400 m^3 per year.
- PT NSI
  PT NSI, another existing customer in the petrochemical industry, requires an additional 16.67 lps of water, equivalent to 518,400 m^3 per year.

Table 4.3 Water Demand and Revenue Projection

Water Demand

No.	Customer	Max. Vol	2024	2025	2026	2027
	Min. Take or Pay		*75%*	*75%*	*75%*	*75%*
1	PT LCI	9,486,720	474,336	4,506,192	7,115,040	7,115,040
2	PT CAP	3,110,400	2,332,800	2,332,800	2,332,800	2,332,800
3	PT NSI	518,400	388,800	388,800	388,800	388,800
4	PDAM	839,808	629,856	629,856	629,856	629,856
	Tariff (Rp./M3)		11,532	11,820	12,116	12,419
	Tariff Growth	2.5%				

**PT. LCI Min.Take or Pay 5% (2024), 47.5% (2025) and 75%*

Revenue

No.	Customer	2024	2025	2026	2027
1	PT LCI	5,470,042,752	53,264,541,298	86,204,454,995	88,359,566,370
2	PT CAP	26,901,849,600	27,574,395,840	28,263,755,736	28,970,349,629
3	PT NSI	4,483,641,600	4,595,732,640	4,710,625,956	4,828,391,605
Total		**36,855,533,952**	**85,434,669,778**	**119,178,836,687**	**122,158,307,604**

**Perumda Cilegon isn't part of the revenue because it's intended for community allocation*

Source : Writer's own work

4. Operating Expense Projection

- Fixed Cost Projection

  Fixed costs are recurring expenses, such as monthly or annual payments, that are unaffected by production or sales fluctuations.

Table 4.4 Fixed Cost Projection

Cost	2024	2025	2026	2027
Fixed Cost				
Operation				
Salary & Wages	865,440,000	930,348,000	1,000,124,100	1,075,133,408
Repair & Maintenance	5,194,800,000	5,402,592,000	5,618,695,680	5,843,443,507
Insurance Rent Tax				
Industrial Water Royalty	2,000,000,000	2,080,000,000	2,163,200,000	2,249,728,000
Utility	1,632,810,333	1,698,122,747	1,766,047,657	1,836,689,563
Transportation & Communication	220,421,860	229,238,735	238,408,284	247,944,616
Sub Total	9,913,472,194	10,340,301,481	10,786,475,721	11,252,939,093
Labour				
Training	200,000,000	208,000,000	216,320,000	224,972,800
Development	200,000,000	208,000,000	216,320,000	224,972,800
General Adm Fees	48,000,000	49,920,000	51,916,800	53,993,472
Subtotal	448,000,000	465,920,000	484,556,800	503,939,072
Total Fixed Cost	**10,361,472,194**	**10,806,221,481**	**11,271,032,521**	**11,756,878,165**
Depreciation Expense	13,922,713,613	13,922,713,613	18,806,713,613	18,806,713,613
Sub Total	**24,284,185,806**	**24,728,935,094**	**30,077,746,133**	**30,563,591,778**

Source : Writer's own work

The difference between the total investment cost of Rp.303,440,327,984 and the capital expenditure depreciated in this calculation amounting to 276,628,568,064 is due to the Interest During Construction (IDC) of Rp. 26,811,759,920. In the calculation of investment cost, the considerations are as follows:

- Interest During Construction (IDC) is included in the Total Investment Cost because interest expenses incurred during construction must be capitalized as part of the investment cost according to PSAK 26 – Borrowing Cost.
- Interest During Construction is not added back to EBIT after tax because Interest During Construction is a cash out transaction, distinct from depreciation and amortization expenses which are non-cash economic events. In calculating Operating Cash Flow (OCF), depreciation and amortization expenses are added back to EBIT after tax. This is due to the fact that depreciation and amortization expenses are non-cash economic events, whereas Interest During Construction is a cash out transaction.
- IDC also cannot be included in operating expenses because IDC is a financing cost, Operating Cash Flow (OCF) only addresses the revenue and the operating expenses associated with the specific project.

Table 4.5 Depreciation and Amortization

CAPEX	Useful Life	Total	2024	2025	2026	2027
EPC						
1. Distribution Network	20	46,620,000,000	2,331,000,000	2,331,000,000	2,331,000,000	2,331,000,000
2. WTP	20	164,280,000,000	8,214,000,000	8,214,000,000	8,214,000,000	8,214,000,000
3. MEIO Facility	10	48,840,000,000			4,884,000,000	4,884,000,000
Total EPC		**259,740,000,000**	**10,545,000,000**	**10,545,000,000**	**15,429,000,000**	**15,429,000,000**
Supporting Investment						
1. Project Supervision	5	7,792,200,000	1,558,440,000	1,558,440,000	1,558,440,000	1,558,440,000
2. Land Rent	5	2,863,718,064	572,743,613	572,743,613	572,743,613	572,743,613
3. Permit & legal	5	3,636,360,000	727,272,000	727,272,000	727,272,000	727,272,000
4. Social Cost	5	1,687,200,000	337,440,000	337,440,000	337,440,000	337,440,000
5. Insurance	5	909,090,000	181,818,000	181,818,000	181,818,000	181,818,000
Total Supporting Investment		**16,888,568,064**	**3,377,713,613**	**3,377,713,613**	**3,377,713,613**	**3,377,713,613**
Total		**276,628,568,064**	**13,922,713,613**	**13,922,713,613**	**18,806,713,613**	**18,806,713,613**
Grand Total		**276,628,568,064**	**13,922,713,613**	**13,922,713,613**	**18,806,713,613**	**18,806,713,613**

Source : Writer's own work

- Variable Cost Projection

  Variable costs are operating expenses that vary with the volume of water production. These costs increase with higher production and decrease with lower production.

Table 4.6 Variable Cost Projection

Cost	2024	2025	2026	2027
Variable Cost				
Chemical Expense (Unit Cost)				
Alum Sulfate	230	239	248	258
Koagulan Aid	37	38	40	41
Desinfektan (Chlorine Gas)	50	52	54	56
Desinfektan (Chlorine 60%)	24	24	25	26
PH Adjustment	5	5	5	5
Mud flocculant				
Lime Milk	10	10	11	11
Sub Total (Unit Cost)	355	369	383	399
Sub Total Chemical Expense	1,360,483,374	2,901,639,793	4,018,233,770	4,179,083,918
Non Chemical Expense (Unit Cost)				
Electricity	911	948	986	1,025
Raw Water Fee	197	204	213	221
BJPSDA	155	161	168	174
Spareparts	91	95	98	102
Sub Total (Unit Cost)	1,354	1,408	1,464	1,523
Sub Total Non Chemical Expense	5,179,886,842	11,064,322,521	15,327,344,125	15,940,437,890
Total	**1,708**	**1,777**	**1,848**	**1,922**
Total Variable Costs	**6,540,370,216**	**13,965,962,314**	**19,345,577,895**	**20,119,521,808**

Source : Writer's own work

5. Operating Cash Flow (OCF) Calculation

To perform capital budgeting analysis, the Operating Cash Flow (OCF) is calculated by subtracting costs from revenue after tax and adding back depreciation and amortization expenses. This provides a comprehensive view of the project's financial feasibility.

Table 4.7 Operating Cash Flow Projection

Item	2024	2025	2026	2027
EBIT	6,030,977,929	46,739,772,369	69,755,512,659	71,475,194,019
NOPAT	4,704,162,785	36,457,022,448	54,409,299,874	55,750,651,334
ADD BACK : Depr.Exp. & Amort.Exp	13,922,713,613	13,922,713,613	18,806,713,613	18,806,713,613
OCF	**18,626,876,397**	**50,379,736,061**	**73,216,013,487**	**74,557,364,947**

Source : Writer's own work

6. Project Investment Analysis

Capital budgeting analysis utilizes various parameters to evaluate project investments. They comprise calculations for NPV, IRR, and Discounted Payback Period. To calculate these parameters, we need to determine the weighted average cost of capital (WACC), which is obtained by summing weighted average of the cost of capital and the cost of debt.

- Cost of Equity

The risk-free rate, which is the return on a riskless investment, was 6.49% in Indonesia for December 2023. The beta for the utility (water) industry is 0.71, and the implied market return is 10%. Using the Capital Asset Pricing Model (CAPM), the cost of equity is calculated as follows:

Table 4.8 Calculation of Cost of Equity

Cost of Equity	
Risk Free Rate	6.49%
Beta	0.71
Market Return	10%
Cost of Equity	8.98%

Source : Writer's own work

- Cost of Debt After Tax

The effective rate a company pays on its borrowed funds is the cost of debt. Based on an 8% interest rate and a 22% corporate tax rate, the after-tax cost of debt is 6.24%.

Table 4.9 Calculation of Cost of Debt after Tax

Cost of Debt after Tax	
Interest rate on Loan	8.00%
Corporate Tax Rate	22%
Cost of Debt after Tax	6.24%

Source : Writer's own work

- Weighted Average Cost of Capital

WACC is calculated by combining the cost of equity and the after-tax cost of debt, weighted by their respective proportions in the company's capital structure.

Table 4.10 Calculation of Weighted Average Cost of Capital

WACC	
Cost of Equity	8.98%
Cost of Debt after Tax	6.24%
Weight of Equity	20%
Weight of Debt	80%
Total WACC	6.79%

Source : Writer's own work

- NPV, MIRR, and Discounted Payback Period

To evaluate the financial viability of investment projects, NPV, Modified Internal Rate of Return (MIRR), and Discounted Payback Period are used.

Because the project has no cash flow in Year 0 and negative cash flows in the initial years, MIRR is used instead of IRR. MIRR is preferred in this scenario as it accounts for the actual reinvestment cost of cash flows at the project's cost of capital, addressing the limitations of IRR.

Table 4.11 Calculation of NPV, MIRR and Discounted Payback Period

(In thousands rupiah)

Items	2024	2025	2026	2027	2028	2029
	1	*2*	*3*	*4*	*5*	*6*
Investment Cost	(172,923,623)	(130,516,705)	-	-	-	-
OCF	18,626,876	50,379,736	73,216,013	74,557,365	75,413,707	76,025,016
CASH FLOWS	**(154,296,747)**	**(80,136,969)**	**73,216,013**	**74,557,365**	**75,413,707**	**76,025,016**
Present Value	(144,488,276)	(70,272,368)	60,122,024	57,331,580	54,303,708	51,263,890
Accumulated PV Cash Flow	(144,488,276)	(214,760,644)	(154,638,619)	(97,307,040)	(43,003,332)	8,260,558
WACC	6.79%					

MIRR	**13.88%**	
NPV	**514,063,221**	
Discounted PB Period	**6.84**	**Years**

Source : Writer's own work

4.2 Solution and Proposed Implementation Plan

1. Net Present Value

The Net Present Value (NPV) of this project is calculated to be Rp. 514,063,221,000, indicating a positive NPV. This suggests that the project is financially feasible.

2. Modified Internal Rate of Return

The Modified Internal Rate of Return (MIRR) for this project is 13.88%, which exceeds the Weighted Average Cost of Capital (WACC) of 6.79%. This indicates that the investment is financially viable based on the MIRR.

3. Discounted Payback Period

The Discounted Payback Period for this project is estimated at 6.84 years, which is shorter than the investment's economic lifetime. This shows the financial feasibility of the investment.

V. CONCLUSION AND RECOMMENDATION

5.1. Conclusion

The project's viability was evaluated using capital budgeting methods, focusing on Net Present Value (NPV), Modified Internal Rate of Return (MIRR), and Discounted Payback Period. The analysis reveals that the NPV of the project is Rp. 514,063,221,000, indicating a positive net value, thereby confirming the project's financial feasibility. Additionally, the MIRR stands at 13.88%, which is significantly higher than the Weighted Average Cost of Capital (WACC) of 6.79%, further substantiating the project's financial viability. Furthermore, the Discounted Payback Period is estimated at 6.84 years, which is shorter than the project's economic lifetime, showing the investment's feasibility. In summary, the capital budgeting analysis verifies that PT XYZ's Phase III capacity enhancement project is financially feasible and capable of effectively meeting the increasing demand for clean water in the Cilegon area.

5.2. Recommendations

Based on the conclusions drawn from the financial analysis, several recommendations are proposed for PT XYZ. Firstly, it is essential to implement continuous financial monitoring and assessment throughout the project's lifecycle. Regular updates and evaluations will ensure that the project remains on track and any deviations from the expected financial outcomes are quickly addressed. Secondly, PT XYZ should ensure that the project aligns with its vision of environmental sustainability. Investing in green technologies and practices will strengthen the company's reputation as a responsible water provider. Lastly, investigating the potential of emerging technologies, such as smart water management systems and advanced treatment processes, could significantly enhance the project's efficiency and sustainability.

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