JOSS :
Journal of Social Science
Volume 2 Number 12 November 2023
p- ISSN 2963-1866- e-ISSN 2963-8909

# INVESTMENT PROJECT ANALYSIS OF EXTRA FACILITY BUSINESS MODEL CASE STUDY: PT. PLN (PERSERO) RIAU AND RIAU ISLANDS DISTRIBUTION UNITS

**Silvia Iriani[1], S. K. Wiryono[2]**
Master of Business Administration, School of Business and Management Institut Teknologi Bandung, Indonesia
E-mail: silvi4.iriani@gmail.com[1], sudarso_kw@sbm-itb.ac.id[2]

**KEYWORDS**
Extra Facilities, Feasibility Study, Internal Rate of Return, Net Present Value, Payback Period, Profitability Index.

## ABSTRACT

The development of disruptive business and technology has the potential to reduce the growth of electricity sales. The existence of "Indirect competitors" who also take advantage of the use of assets that do business in the electric vehicle ecosystem, companies providing solar PV rooftop services, and the emergence of new business areas will be a challenge for PLN. Companies must develop a business model strategy to ensure the company's financial sustainability, which ultimately ensures the sustainability of the electricity business in the future. Real improvements are expected to help companies increase revenue, efficiency, and cost effectiveness which can ultimately contribute to company revenue. Through the Extra Facilities business model, as a form of service to meet changing market tastes, sales strategies need to be implemented for customers who have special standards and needs. In this regard, the author carried out an analysis of the investment for connecting Extra Facility services to one of the prospective PLN customers of the Riau and Riau Islands Distribution Main Unit using a build-operate-transfer (BOT) scheme. The feasible indicator that was being used was financial profitability, resulting in IDR. 6,914,249,547 NPV higher than zero. Moreover, this project also gives certain commitment by generating 17.56% IRR > WACC with a payback period of 4 years 8 months less than 10 years (based on the term of the agreement). This indicator is financially feasible because the service fees charged by PLN to customers can cover/reimburse the costs incurred in providing these services, with an adequate rate of return/margin. Financially feasible to conduct with the escalation of +15% and -15%, respectively for sensitivity analysis, with several variables sensitive to changes in NPV values such as changes in investment costs, incremental cashflow/revenue, operating and maintenance costs, and changes in the loan portion. This variable is also used as a reference in conducting scenario analysis and Monte Carlo analysis with a mere 1.27% probability of a negative NPV. The project has an estimated COD at the end of 2024.

## INTRODUCTION

In the era of disruption that we live in today, changes occur so fast and unpredictable, that many factors are difficult to control. Companies are required to have competent adaptive

and exploratory capabilities. Based on these challenges in the electricity business run by PT. PLN (Persero), the company must develop a business strategy to ensure the financial sustainability of the company which in turn is for the sustainability of the electricity business for the future. Measures such as increasing sales through digital-based marketing strategies to improve service to consumers, accelerating cash in for company operations and cash flow, in accelerating connections to increase revenue are strategic steps for the company's financial sustainability. This involves managing its financial resources in a way that ensures it can continue to operate, meet its financial obligations, and achieve its objectives without relying solely on short-term funding or unsustainable practices. For this reason, PLN as a company with very large assets, must prepare a good planning program to obtain optimal benefits from its assets. Awareness of PLN's business processes needs to be built as a business company and not just an operation company. PLN must increase the growth of prospective/existing customers to overcome the issue of non-subsidized customer revenue models (Reksono & Rahim, 2023). It is hoped that this Extra Facility investment analysis model can become one of PLN's future solutions for increasing its income (Bai et al., 2023).

PT. PLN (Persero) is a state-owned company engaged in the business of providing electricity, starting from generation, transmission, distribution, and retail sales of electricity (Adi, 2023). Throughout 77 years of journey, PT. PLN (Persero) is one of the companies with the largest assets in Indonesia of Rp. 1.613 trillion (PT. PLN (Persero) Financial Report 2021 audited). Due to the wide scope of PLN's working area, in terms of electricity distribution services, PLN divides the functions of its main unit into several main units spread throughout Indonesia.

Increasing uncertainty in the business environment requires companies to increase preparations to maintain business continuity. With the development of disruptive business and technology (electrification of the economy, renewable energy, new technology, shifting profit pools, and new competition) it has the potential to reduce electricity sales growth and change electricity business patterns. PLN must look for other solutions to increase sales to ensure sustainable company growth, such as high revenue growth and accelerated cash inflow (cash is king). Real improvements are expected to help companies increase revenue and cost effectiveness which can ultimately contribute to the company's financial sustainability. Companies must look for new business solutions as additional facilities and diversify their business to meet changing market tastes in sales strategies (beyond kWh) (Chesbrough, 2011).

The research objective is to propose a business model using financial criteria in the form of IRR and NPV to increase company revenue. The priority here is apart from PLN's obligations as public service obligations and other mandatory work that must be carried out.

Investment analysis will be focused on business development by PLN collaborating with subsidiaries, to meet the demands of prospective customers who require large investment costs but have a limited budget. Through the calculation of the feasibility study, a large rate of return (IRR> WACC) will be obtained, and positive future cash receipts (NPV> 0).

## METHOD RESEARCH

This research uses primary and secondary data analysis. Secondary data is based on data published by the company, namely the (Annual Report PT. PLN (Persero), 2022), information from PT. PLN, presentation material from PT. PLN, and regulation from the government. Other secondary data collection by looking for references to books and articles related to case studies on the offered business model comes from libraries and the internet that support theoretical analysis, business economics, as well as regulations and regulations set by the government in the electricity sector.

Primary data is a collection of data derived from the results of meetings with several prospective customers who require reliability, aesthetics, and special treatment for the construction of electricity infrastructure which involves calculating the suitability of tariffs regularly paid every month.

**Research Design**

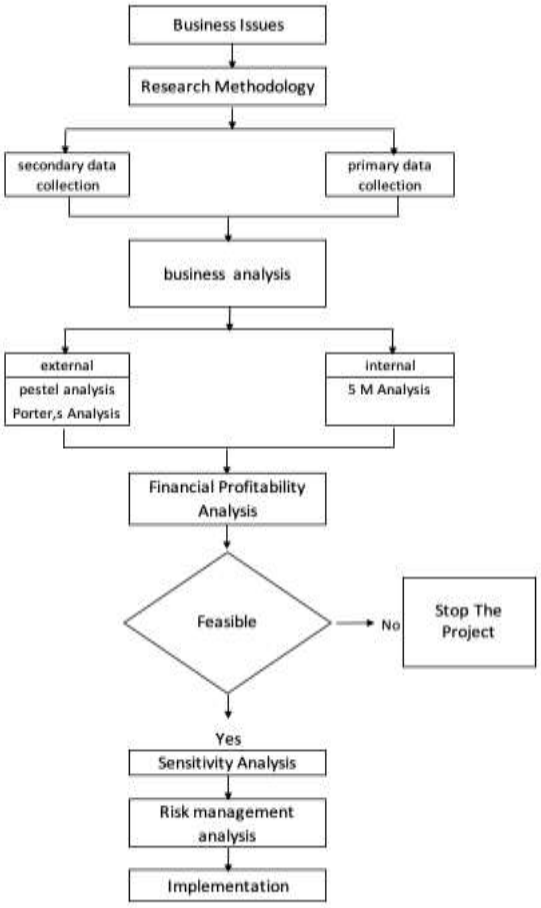


**Figure 1**
**Research Design**

The challenge faced by PLN is managing the capital budget for preparing investment work scenarios to generate good long-term returns. Business analysis is carried out both internally and externally in this study, the project's financial feasibility study is then calculated to generate good company returns, and most identified will use a quantitative approach. For this study, the theoretical framework can be seen in Figure 4.

## RESULTS AND DISCUSSION

A feasible financial analysis is required to assess the feasibility of new business models to increase revenue for the company (Teece, 2010). this value creation is doing business not as usual. Beyond kwh is needed for business diversification. Feasible projects can be identified using financial studies such as the internal rate of return (IRR), Net Present value (NPV), and small payback period. A cash flow is projected and calculated using estimated revenue and O&M cost of the new business model.

### Project Cost Structure

To assess the feasibility of the project, two main components are evaluated: Capital Cost and Operational cost (O&M cost). The following are the general assumptions used in financial calculation carried out:

**Table 1**
**General Assumption Financial calculation**

| Scheme | Bot | Build Operate Trasfer |
|---|---|---|
| Investement cost | 16.196.272.000 | IDR |
| O & M Cost (2% from investment) | 323.925.440 | IDR/Year |
| Depreciation | 1.619.627.200 | Capex/lime time |
| Interestrate | 9,70% | RKAP PLN |
| Connecting power (kVA) | 3.565 | Adapt to customer requests |
| Minimum hour/month | 400 | Minimum customer usage hours, negotiable with customer |
| Minimum energy (kWh/year) | 16.632.000 | Minimum energy as revenue certainty for cost recovery agreed with customer |
| Incremental cashflow or revenue/year (IDR) | 5.987.520.000 | Based on average customer usage. In this project 400 hour/month |
| Lime Time | 10 Year | Negotiable with customer, in this project we use 10 years |
| Inflation | 3,6% | RKAP PLN |
| Government tax | 22% | Tax Rate Idn |
| Equity project portation | 50,0% | |
| Debt Project Portation | 50,0% | |

### Capital Cost

Capital cost is associated with initial investment incurred by investors during the pre-development and construction phase of the project. All costs incurred in extra facility services will vary depending on the project being undertaken. In general, for this project, the capital cost consists of the cost of procuring the main components, development services, and the licensing process. This project is estimated to be completed within ten (10)-twelve (12) months. the period starting 2023 to 2024.

### Operational Cost

Operational Cost consists of Fixed cost as a B component, namely all process costs related to preventive maintenance and operation expenses during the agreement process period (in this project for 10 years).

### Depreciation and Amortization

In this case, the depreciation of the infrastructure built is based on the year of the agreement (in this project for 10 years) so the depreciation is calculated over 10 years.

**Taxes and Projected Cashflow**

In this project, the ratio used refers to the subsidiary loan scheme to the parent company, with the ratio used in the calculation being 50:50 in financial analysis, and amortization is not calculated because the tangible assets are not registered. So only taxes and depreciation will affect the cash flow calculation.

**Cost Of Debt**

Cost of debt is the percentage of fee payable by the firm to get loans, Cost of debt is determined by the interest rate charged to the firm. In this research, the BOT business model uses using same assumption of debt variables in long-term and short-term debt. The company uses debt as a source of financing to support investment.

$$r_i = r_d \, x \, (1 - T)$$

$$r_i = 9{,}7\% \, x \, (1 - 22\%) = 7{,}57\%$$

**Table 2**
**Cost Of Debt**

| Variable | Value | Source |
|---|---|---|
| Interest Rate | 9,70% | Based on RKAP PLN |
| Effective Tax Rate | 22,00% | |
| Cost Of Debt | | 7,57% |

**Cost Of Equity**

The cost of equity is the required return that shareholder expect as compensation for bearing the risk of their investment. The higher the risk of investment the higher the return expected by the investor.

The cost of equity is calculated by using the Capital Asset Pricing Model (CAPM) which is suitable for developing markets. The calculation can be determined by using the below adjusted CAPM model.

*Cost of Equity = Risk-Free Rate + Levered Beta x Equity Risk Premium*

**Table 3**
**Cost Of Equity**

| Variable | Value | Source |
|---|---|---|
| Levered Beta | 0,91 | Risk Project. Slope revenue PLN&IHSG |
| Risk-free rate | 6.60% | IBPA Government 10Y-BOND yield |
| Equity Risk Premium | 7,89% | Damodaran (https://pages.stern.nyu.edu/adamodaran/New_home_page/datafile/ctryprem.html) |
| Cost of equity | | 13,78% |

The result of calculating the average Cost of Equity is 13,78% using the assumption of Risk Project, IBPA, http://www.marketrisk-premia.com/id.html, and Damodaran (https://pages.stern.nyu.edu).

**Weighted Average Cost of Capital**

To calculate the weighted average cost of capital, we use the debt and equity portion to reach WACC. WACC reflects the average future cost of funds over the long term as well (Team, Wallstreetmojo, Ashish Kumar Srivastav, Dheeraj Vaidya, CFA, 2023).

*WACC = Weight of Debt x Cost of Debt after tax + Weight of Equity x cost of equity*

From the data cost of debt and cost of equity above could be summarized as follows:

**Table 4**
**WACC**

| WACC Calculation | | Waight | Cost | Weighted Cost |
|---|---|---|---|---|
| Cost Of Debt (After Tax) | Calculated | 50.0% | 7,57% | 3,78% |
| Cost Of Equity | Calculated | 50,0% | 13,78% | 6,89% |
| **WACC** | | | **10,67%** | |

**Net Present Value**

One of the criteria used to analyze the project feasibility is Net Present Value, where the future cash flow should be discounted to its present value using the WACC discount rate. Based on the calculation, the NPV of the investment of the project is IDR 6.914.249.587, - (positive) therefore it is feasible.

**Internal Rate of Return (IRR)**

The internal rate of return is the discount rate that makes the Net Present Value (NPV) of all cash flows equal to zero in a discounted cash flow analysis. The IRR value is greater than the discount rate, meaning that the project is profitable. Based on the calculation of the IRR value of the BOT business model, it is 17,56% greater than the WACC, which is 10,67%.

**Payback Period**

The payback Period is the time needed to return the investment (break-even point = 0). The faster the payback time, the smaller the risk and the more attractive the investment. Conversely, the longer the return on investment, the greater the risk and the less attractive the investment will be. Based on the calculation of the payback period, the resulting BOT scheme is 4 years and 8 months under the installment period determined for 10 years. So, the break-even point generated in this project is 5 years.

**Profitability Index**

The profitability index is a method of calculating the feasibility of a project by comparing the total present value of the cash flow value with the investment value of the project.

*Profitability Index = (Net Present Value + initial investment) / Initial Investment*

Based on the calculation, the profitability index of the investment BOT scheme project is 1,427 greater than 1, so the project is profitable.

**Sensitivity Analysis**

Sensitivity analysis is calculated with the following parameter variations.

a. Investment Cost

Investment costs increase due to increasing capital costs due to increases in material prices, political and social stability, or the influence of exchange rates and national income. Based on sensitivity analysis, a 15% increase in investment costs will cause the NPV to decrease to IDR 3.353.397.200, - while the IRR is 12,62%. This value is still greater than the WACC of 10,67%. So, the project is said to be feasible if the increase in investment costs is 15%.

**Table 5**
**Sensitivity Analysis in Investment**

| Investment | Base | +5% | +10% | +15% | -5% | -10% | -15% |
|---|---|---|---|---|---|---|---|
| Investment cost (IDR) | 16.196.272.000 | 17.005.085.600 | 17.815.899.200 | 18.625.712.800 | 15.386.458.400 | 14576.644.800 | 13.766.831.200 |
| NPV (IDR) | 6.914.249.557 | 5.727.298.792 | 4.540.347.996 | 3.353.397.200 | 6.101.200.383 | 9.288.151.179 | 10.475.101.974 |
| IRR | 17,56% | 15,80% | 14,16% | 12,62% | 18,46% | 21,52% | 23,76% |

b. Incremental Cashflow/Revenue

Incremental cash flow or revenue is based on the minimum customer energy calculation (kilo-watt hours) x monthly sales rate set for the customer. In this project, the monthly selling rate for Extra Facilities is IDR 360/kWh. Based on sensitivity analysis, the NPV was obtained at IDR 2.502.010.217, - and IRR 12,05%, which still has the potential to be profitable when income falls by 15%.

**Table 6**
**Sensitivity Analysis in Incremental Cashflow**

| Incremental cash flow | Base | +5% | +10% | +15% | -5% | -10% | -15% |
|---|---|---|---|---|---|---|---|
| Usage hour | 400 | 420 | 440 | 460 | 380 | 360 | 340 |
| NPV (IDR) | 6.914.249.587 | 8.384.996.004 | 9.855.742.501 | 11.326.488.957 | 5.443.503.131 | 3.972.756.674 | 2,502.010.217 |
| IRR | 17,56% | 19,32% | 14,16% | 12,62% | 18,46% | 21,52% | 12,05% |

c. Operation and Maintenance Cost

Operation and maintenance costs are 2%-3% of the investment value (in this project the O&M cost limit is 2% x investment costs). For every 15% increase in operating and maintenance costs, the NPV value will decrease to IDR 6.687.967.270, - and IRR 17,27%. The project still has the potential to be profitable when operating and maintenance costs increase by 15%.

**Table 7**
**Sensitivity Analysis in O&M Cost**

| Operation & Maintenance | Base | +5% | +10% | +15% | -5% | -10% | -15% |
|---|---|---|---|---|---|---|---|
| O & M Cost | 323.925.440 | 340.121.712 | 356.317.984 | 372.514.256 | 307,729.168 | 291.532.896 | 275.336.624 |
| NPV (IDR) | 6.914.249.587 | 6.838.822.148 | 6.763.394.709 | 6.687.967.270 | 6.989.677.026 | 7.065.104.466 | 7.140.531.905 |
| IRR | 17,56% | 17,47% | 17,37% | 17,27% | 17,66% | 17,75% | 17,85% |

d. Changes in Loan Proportion

Based on sensitivity analysis when changing the funding proportion using 90% liability, an increase in NPV was obtained to IDR 8.848.218.523, - and a decrease in IRR to 16,09% with a Payback Period of 5 years and 0 months. This loan proportion limit still has the potential to be profitable in the project even though there is a loan interest expense as a cost of funds (tenor 5 years), but the payback period activity is slightly higher than the base case and returns are decreasing.

**Table 8**
**Sensitivity Analysis in Loan Promotion**

| Changes in loan proportions | Base | 50% | 60% | 70% | 90% |
|---|---|---|---|---|---|
| WACC | 10,67% | 10,67% | 10,05% | 9,43% | 819% |
| NPV (IDR) | 6.914.249.587 | 6.914.249.587 | 7.356.009.497 | 7.824.395.919 | 8.948.218.523 |
| IRR | 17,56% | 17,56% | 17,19% | 16,82% | 16.09% |
| Payback period | 4 year 8 month | 4 year 10 month | 4 year 9 month | 4 year 10 month | 5 year 0 month |

From the sensitivity analysis in investment with a discount rate calculation of 10.67%, the sensitivity level allowed is only sufficient for a 15% increase in investment costs, while if the increase in investment exceeds 15% then the project is not feasible. The following is an overview of the sensitivity analysis of the project.

**Table 9**
**Sensitivity Analysis Recap**

| parameter | Base | investment | Incremental cash flow | O & M Cost | Debt Portion |
|---|---|---|---|---|---|
| Variation | 0% | 15% | -15% | 15% | 90% |
| IRR (%) | 17.56% | 12.62% | 12.05% | 17.27% | 16.09 |
| NPV (IDR) | 6.914.249.587 | 3.353.397.200 | 2.502.010.217 | 6.687.967.270 | 8.848.218.523 |
| Payback period (Year) | 4,66 | 5,583 | 5,75 | 4,75 | 5 |

Table 12 shows that in the case of variations in the parameters reviewing the project Extra facilities for connecting potential customers remain potentially profitable.

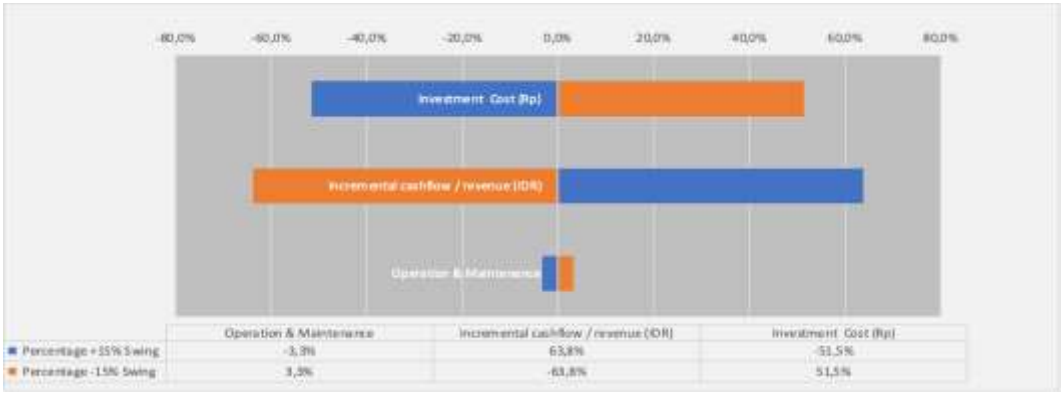


**Figure 2**
**NPV Tornado Chart**

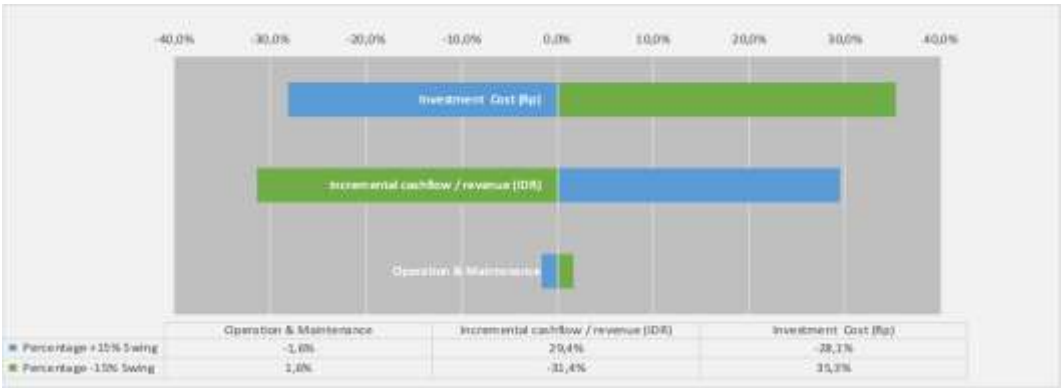


**Figure 3**
**IRR Sensitivity Tornado Chart**

**Risk Analysis (Monte Carlo Analysis)**

**Table 10**
**Descriptive Statistics**

| Descriptive Statistics | |
|---|---|
| Min | (109.932.319.76) |
| Max | 13.275.413.072,99 |
| Mean | 6.616.105.600,77 |
| Standard deviation | 2.960.043.781,84 |
| Median | 6.498.999.195,75 |
| Kurtosis | (0,75) |
| Skewness | (0,05) |
| Prob NPV<0 (Worst Case) | 1,27% |

Based on Monte Carlo simulation, the minimum NPV is negative while the maximum is at (IDR) 13.275.418.072, -. The mean NPV at (IDR) 6.616.105.600, - is slightly lower than the base scenario. The negative value of kurtosis -0,75 indicates that data distribution has a lower peak than normal distribution. The positive value of skewness at 0,05 indicates that indicating that most of the distribution is in low values. This project has a probability when NPV (worst case) is less than 1,27 % as such this risk probability needs to be considered by management.

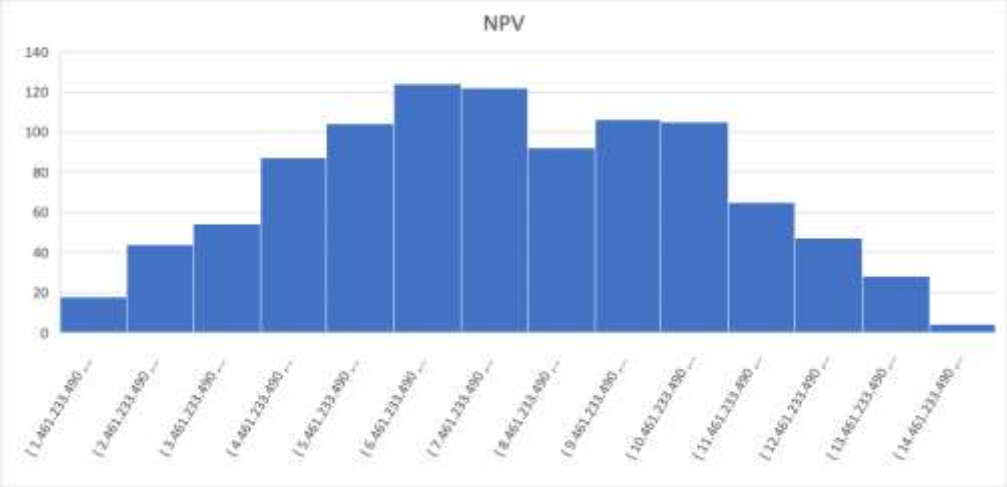


**Figure 4**
**Monte Carlo Chart**

**Scenario Analysis**

**Table 11**
**Scenario Analysis**

| Parameter | Input Cell | Worst Case | Base Case | Best Case | Monte Carb Simulation | Remarks |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | |
| Operation & Maintenance (IDR) | 307.231.075 | 372.514.256 | 323.925.440 | 275.336.624 | 307.231.075,00 | Range (85%115% |
| Incremental cashflow/revenue (IDR) | 362,00 | 340,00 | 400,00 | 460,00 | 362,00 | Range (85%115% |
| Investment cost (IDR) | 18.492.020.310 | 18.625.712.800 | 16.196.272.000 | 13.766.831.200 | 18.492.020.310.00 | Range (85%115% |
| Debt portion (%) | 39% | 58% | 50% | 43% | 39% | Range (85%115% |
| NPV (Mio IDR) | 1.655.535.678 | (97.751.351) | 6.748.765.464 | 13.595.282.27.8 | | |
| IRR Project | 10,73% | 8,64% | 17,38% | 27,89% | | |
| PBP (Years) | | 6,66 | 4,66 | 3,42 | | |
| PI | | 0,92 | 1,33 | 1,91 | | |
| Range Of NPV | | | IDR 13.693.033.629 | | | |
| Probability | | 0,93% | 50,93% | 0,01 | | |

Based on the analysis scenario above, the probability of the risk of the worst case occurring is 0,93% with NPV <0 while IRR = 8,64% and the payback period is 6,66 years. If the company runs according to the base case probability of occurrence of 50,93% then the NPV is > 0, and the project IRR = 17.38% with a payback period of 4.66 years. If the best-case condition occurs then the NPV is > 0, IRR = 27,89% while the payback period is 3,42 years. Based on the scena(rio analysis above, it shows growth, which can offer financial benefits for the company.

**Proposed Investment Strategy**

The investment strategy can be carried out by either holding itself or handing it over to a subsidiary company to manage the cooperation. If it is managed by a subsidiary, most investment costs will be covered by the holding company's loan.

**Risk Management**

In this chapter, we would like to identify the risk that could undermine the objective of the Extra Facilities Business Model. Based on Monte Carlo Analysis the probability of the result NPV < 0 is 0,93%. However, of course, the result of the analysis cannot be fully used as a reference and further mitigation needs to be carried out regarding the potential losses that may be experienced. The risk could be identified based on the following risk, or the risk management consists of three processes, which are identification, analysis, and mitigation. The proposed risk management of the project is explained in Table 12.

**Table 12**
**Proposed Risk Management of Extra Facility**

| No | Identification | Analysis | | Evaluation ( Mitigation) |
|---|---|---|---|---|
| | | Cause | Impact | |
| 1 | Incremental cash flow (revenue) | Customer usage decreases so that operating hours decrease | Income decreases which will affect project income/net income | Determining a binding minimum target for customer usage hours during the contract period |
| 2 | Investment cost | Increasing cost of capital due to interest rate polocies and monetary tightening in major currency coubtries | Increasing investment cost | The funding side from creditors during the project period uses a fixed interest rate scheme issuing corporate bonds/bonds to obtain funding at lower costs with interest and loan payment tems adjusted to the company's circumstances. |
| 3 | inflation | Conditions of economic, social and political in stability | Increasing cost of production | Monitoring project work progress and placing orders for main materials in advance |
| 4 | Delay in project execution | Delay in making project decision, delay in licensing process, delay in plant material delivery,delay in constraction and custom issues | Decrease in project value due to CoD delays has material/revenue (time value of money) and non-material impacts | Online single submission (OSS) application, electronic consultancy, standard tender documents, setting cooperation patterns for severa, parties, e SCM Monitor work projects periodically with vendors and impose fines on vendors if delays accour |

**Justification Of Implementation Plan**

In this chapter, the author is aware of the latest issuance of Board of Director regulation no 0049.P/DIR/2020 as service guidelines for using electricity with extra facilities by PT. PLN (Persero). The purpose of this regulation is to provide a solution for customers who need extra facilities, minimize potential sales loss in kwh caused by sensitive load outages on the customer's side, as well as obtain additional potential sales from customers or potential customers. The IRR for service offerings is at least 13% (thirteen percent). The amount of ROK (risk overhead profit) for service offerings is at least 5% (five percent). The proposed IRR of 13% (minimum) and 15% (as initial calculation) and ROK 5% (minimum) and 7% (as initial offer) is enough to provide an adequate profit margin for PLN so that customer requests for extra facility services are worthy of being followed up.

As a rule, the component determined in a service solution is not the amount of the service fee rate, but rather how to calculate the service fee which is reflected in the agreed IRR or ROK. So, whatever the estimated costs incurred will provide information on the amount of service costs by the approved IRR/ROK margin.

## CONCLUSION

Realization of beyond kWh revenue did not reach the 2022 RKAP target, so to anticipate potential opportunities and disruptions in technology, it is necessary to develop beyond kWh Product and Business Innovation and the concept of developing derivative business products. PLN answers the challenge of continuing to grow in serving customer needs by utilizing its assets, infrastructure, and services that are spread all over the country. In line with the spirit of transformation, PLN is innovating to provide comprehensive solutions for customers, presenting new services based on the assets and resources that PLN has. Increasing electricity revenue and beyond kWh through managing B2B Key Account relationships, industrial areas and special economic zones, BUMN, government, and institutions which in turn can contribute to the company's financial sustainability. For the development of extra facilities beyond kWh, financial analysis is performed with some assumptions made to assess the feasibility of the new business model from a perspective model of finance. In this project, the financial evaluation uses base case calculation associated with the following method: (i) IRR on the project is calculated from the outflow stream of investment versus the inflow stream of net profit. (ii) Depreciation is assumed to use a double declining balance on a salvage basis. (iii) The monthly installation is paid fixed price refers to the connected power and minimum on-time hours.

The feasible project can be identified if its interest rate of return (IRR) is above the expected return Net present value (NPV) is positive and a small payback period to mitigate the risk. A cash flow is projected and calculated using estimated revenue and O&M cost of the equipment, the cost depends on the project being carried out and the project lifetime. The feasible indicator that was used was financial profitability, resulting in IDR 6.914.249.587, - NPV higher than 0. This project also gives certain commitment by generating 17,56% IRR on the project with a 5-year payback period of less than 10 years (based on the agreement term of the agreement). This indicator is financially feasible because the service fees that PLN applies to customers can cover/recover the costs that arise in providing these services, at a sufficient level of return/margin.

Sensitivity analysis of the change for installment price, cost, and effective interest rate where it is still financially feasible to conduct with the escalation +15% respectively. Likewise, incremental cash flow decreased by 15%, operating and maintenance costs increased by 15%, and in terms of funding, changes in the loan proportion to 90% debt still provided profitable potential for the project.

In analyzing project risks, scenario analysis involves assessing the impact of various possible scenarios or future conditions on the results of a decision or project. Several risks can still be controlled with existing internal controls and mitigated so that these risks can be accepted. Meanwhile, for risks whose level of measurement is still high, a contingency plan will be carried out so that the risk becomes an acceptable level. Overall, based on the scenario analysis above, it shows growth that can provide financial benefits for the company.

## REFERENCES

Adi, T. W. (2023). Influence of fuel price, electricity price, fuel consumption on operating cost, generation and operating income: a case study on PLN. *International Journal of Energy Sector Management*, *17*(2), 227–250.

Annual Report PT. PLN (Persero). (2022). *Leading The Way to Empower The Nation, data is obtained from the website*. https://web.pln.co.id/statics/uploads/2023/06/Laporan-Tahunan-2022_Final_3005_Med-Res.pdf

Bai, Y., Zhang, Y., Zhang, X., & Ng, T. S. (2023). Business model and supporting policies for projects to implement carbon capture and power-to-gas technologies. *Science of The Total Environment*, *888*, 164150. https://doi.org/https://doi.org/10.1016/j.scitotenv.2023.164150

Chesbrough, H. (2011). *Open services innovation: Rethinking your business to grow and compete in a new era*. John Wiley & Sons.

Reksono, M. B., & Rahim, A. R. (2023). Assessment Models for Feasibility Study of Extra Electricity Facilities Investment Projects. *Proceeding of The International Seminar on Business, Economics, Social Science and Technology (ISBEST)*, *3*(1).

Team, Wallstreetmojo, Ashish Kumar Srivastav, Dheeraj Vaidya, CFA, F. (2023). *Weighted Average Cost of Capital (WACC)*. WallStreetmojo. https://www.wallstreetmojo.com/weighted-average-cost-capital-wacc/

Teece, D. J. (2010). Business models, business strategy and innovation. *Long Range Planning*, *43*(2–3), 172–194.

Perera, R. (2017). The PESTLE Analysis. Sri Lanka: Nerdynaut.

Porter, M E (1980). Competitive Strategy. Technique for Analysing Industries and Competitors. New York: The Free Press.

Rencana Usaha Penyediaan Tenaga Listrik (RUPTL) PT. PLN (Persero) 2021-2030, data is obtained from the website: https://web.pln.co.id/statics/uploads/2021/10/ruptl-2021-2030.pdf. Downloaded on October 6, 2022.

Damodaran, A. (2023, July 14). Damodaran online. Retrieved August 01, 2023, from NYU Stern School of Business: https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html.

Gitman, Lawrence J., Zutter, Chad J. (2014). Principles of Managerial Finance Fourteen Edition, Pearson Education Limited, England.

PT. PLN (Persero) (2023). Rencana Kerja dan Anggaran Perusahaan (RKAP) 2023, Jakarta.

Thompson, M. (2016). Strategic Management: Awareness and Change 6th edition. Southampton: South-Western Pub.

Saltelli, A., Tarantola, S., Campolongo, F., & Ratto, M. (2004). Sensitivity Analysis in Practice. Chichester: John Wiley & Sons Ltd

Regulations of Board of Directors of PT. PLN (Persero) No. 0049.P/DIR/2020. (2020). Pedoman Layanan Pemakaian Tenaga Listrik dengan Fasilitas Ekstra. PT. PLN (Persero).

Regulation of the Minister of Energy and Mineral Resources No. 27. (2017). Tingkat Mutu Pelayanan Dan Biaya Yang Terkait Dengan Penyaluran Tenaga Oleh Listrik PT Perusahaan Listrik Negara (Persero).