

## **FINANCING STRATEGY FOR SIMBELIN MINI HYDRO PROJECT (CASE STUDY: PT ENERGI MEKAR LESTARI)**

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### ***Abstract***

PLTMH is a mini power generation system that can convert water potential with a certain height and discharge into electrical power below 500 kWh, by operating a water turbine and generator. This water discharge management system is an alternative to meet the electricity needs of rural communities. Two micro hydro power plants (PLTMH), namely in Lau Gunung Village, Tigalingga District with a capacity of 10 megawatts (MW) under the banner of PT Impola Mekar Energi and in Pardomuan Village, Siempat Nempu Hilir District with a capacity of 7 MW under the banner of PT Energi Mekar Lestari. The company as a whole is very attractive because the construction of this power plant is for a small scale, usually the largest investment in dam infrastructure, but the dam has already been built by the government, so only a few more can run the project located in Pegagan Julu VI Village, Sumbul District, with an investment of Rp. 164,201,659,771. This author aims to help PT Energi Mekar Lestari, particularly in the Simbelin Project, to find a suitable funding model for the project. Some of the funding models described by the author are using company capital, single investors and debt to the bank. The author uses several financial analyzes such as NPV, WACC, ROE, ROI, US Index, IRR, Profitability Index and Total Fair Market Value. The author uses the current interest rate on loans and deposits of 4.3% and 2.8%. In addition, the author can also determine the value of a company based on the funding model. After obtaining several funding alternatives, the author will determine conclusions regarding the most suitable model used by the company. Having several alternatives can help companies find the right composition of funding to run their projects.

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**Keywords:** Profitability Index, Total Fair Market Value, NPV

### **Abstrak**

*PLTMH merupakan sistem pembangkit listrik mini yang dapat mengubah potensi air dengan ketinggian dan debit tertentu menjadi daya listrik di bawah 500 kWh, dengan mengoperasikan turbin air dan generator. Sistem pengelolaan debit air ini menjadi salah satu alternatif untuk memenuhi kebutuhan listrik masyarakat pedesaan. Dua pembangkit listrik tenaga mikrohidro (PLTMH) yakni di Desa Lau Gunung, Kecamatan Tigalingga berkapasitas 10 megawatt (MW) di bawah bendera PT Impola Mekar Energi dan di Desa Pardomuan, Kecamatan Siempat Nempu Hilir berkapasitas 7 MW di bawah spanduk PT Energi Mekar Lestari. Perusahaan secara keseluruhan sangat menarik karena pembangunan pembangkit listrik ini untuk skala kecil, biasanya investasi terbesar pada infrastruktur bendungan, namun bendungan tersebut sudah dibangun oleh pemerintah, sehingga hanya sedikit lagi yang dapat menjalankan proyek tersebut. di Desa Pegagan Julu VI Kecamatan Sumbul dengan nilai investasi sebesar Rp. 164.201.659.771. Penulis ini bertujuan untuk membantu PT Energi Mekar Lestari khususnya di Proyek Simbelin dalam menemukan model pendanaan yang cocok untuk proyek tersebut. Beberapa model pendanaan yang penulis jelaskan adalah menggunakan modal perusahaan, investor tunggal dan hutang pada bank. Penulis menggunakan beberapa analisis keuangan seperti NPV, WACC, ROE, ROI, US Index, IRR, Profitability Index dan Total Fair Market Value. Penulis menggunakan suku bunga pinjaman dan simpanan saat ini sebesar 4,3% dan 2,8%. Selain itu, penulis juga dapat menentukan nilai suatu perusahaan berdasarkan model pendanaannya. Setelah memperoleh beberapa alternatif pendanaan, penulis akan menentukan kesimpulan mengenai model yang paling cocok digunakan oleh perusahaan. Memiliki beberapa alternatif dapat membantu perusahaan menemukan komposisi pendanaan yang tepat untuk menjalankan proyeknya.*

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*Kata kunci: Indeks Profitabilitas, Total Nilai Pasar Wajar, NPV*

### **I. Introduction**

The availability of electricity is still not evenly distributed throughout Indonesia, especially in remote areas in various provinces in Indonesia. The condition is exacerbated by the increasing demand for electricity in Indonesia along with population growth. Followed by fuel from natural resources (SDA) which is running low and non-renewable. PLTMH is a mini power generation system that can convert water potential with a certain height and flowrate into electric power below 500 kWh, by operating a water turbine and generator. This water discharge management system is an alternative to meet the electricity needs of rural communities.

According to data from the Indonesian Institute of Sciences (LIPI) quoted at [www.lipi.go.id](http://www.lipi.go.id) in 2008, the total hydroelectric potential in Indonesia reached 75,000 megawatts and only 2.5 percent was absorbed. The MHP potential could reach 10 percent of the total electricity potential. hydropower, or about 7,500 megawatts. However, only 60 megawatts of MHP have been used. Various advantages of PLTMH itself, namely the abundant water potential, reliable and robust technology, so that it can operate for more than 15 years, environmentally friendly and renewable technology, and high efficiency reaching 70-85 percent. According to data from the Indonesian Institute of Sciences (LIPI) quoted at [www.lipi.go.id](http://www.lipi.go.id) in 2008, the total hydroelectric potential in Indonesia reached 75,000 megawatts and only 2.5 percent was absorbed. The MHP potential could reach 10 percent of the total electricity potential. hydropower, or about 7,500 megawatts. However, only 60 megawatts of MHP have been used. Various advantages of PLTMH itself, namely the abundant water potential, reliable and robust technology, so that it can operate for more than 15 years, environmentally friendly and renewable technology, and high efficiency reaching 70-85 percent.

To solve this case, we would like take all the related data and investigate each of them then understanding and giving business scheme recommendation. The result will help the company to arrange the business strategy based on data analysis.

PT Energi Mekar Lestari (EML) sees the potential need for energy (electricity) in Indonesia as very high, so it requires various resources including funds and humans to meet these needs. PT EML is under the banner of PT Asri Power Group. The company finds it very attractive overall because

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the construction of the power plant is for a small scale, usually the largest investment in the dam infrastructure, but the dam has already been built by the government, so just a little more can run project located in Pegagan Julu VI Village, Sumbul District, with an investment Rp.164.201.659.771

The government's strong determination to suppress fossil-based energy from year to year encourages a massive increasing in New and Renewable Energy (EBT) power plants is targeted for the mix to reach 23% by 2025. The Ministry of Energy and Mineral Resources also projects that in the next five years the investment cost for increasing the EBT power plant will reach USD 36.95 billion.

Meanwhile, PT EML needs to growth and expand its service to solve some issues, the company proposes a new business model starting with analyzing the company's current business situation using two analytical approaches: Business Process Analysis and Value Proposition. This result relates in operatiration management and fianancial management.

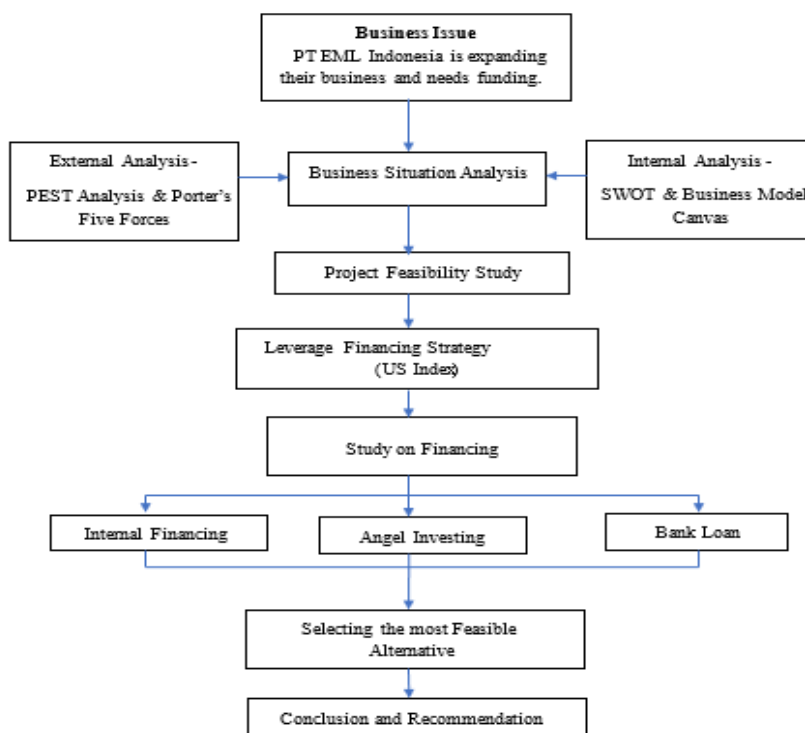


Fig. 1. Conceptual Framework of Simbelin Project

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### Business Process Analysis

A business process is a set of interrelated activities designed to produce an output for the customer. A company must have clear objectives, have input, have creation, use resources, have several activities which in several stages can affect more than one unit in the organization and can create value for consumers. In addition, a great business process is one of the business strategies for a company to compete in the market [4]. The business process in New and Rebewable Energy is the future of energy utilization. The following is a business process analysis from PT EML that consists of six steps.

TABLE I: BUSINESS PROCESS ANALYSIS

Stages	Stakeholder	Problems
Initial Brief	Engineer, Government	Design tariff and contract duration
Business Proposal	Consultant, Engineer, Finance	Accpeting input from government
Design Engineering Detail	Consultant, Engineer, Finance	Design revisions, especially on finishing and material changes
Construction	Consultant, Subcontractor, Engineer, Finance	Quantity of technical drawings in a limited time
Start Construction	Consultant, Subcontractor, Engineer, Finance	Finishing and material change due to client's estimated budget
Final Project	Engineer, Finance, Government	

The business process starts with explaining Indonesia Renewable Energy Roadmap. In the early stages, both the client and the engineer conduct an initial brief regarding the client's wishes and determine the resource and market. The location and requirement will be the main target for the business. Proceed to the next stage; Business Proposal, the company, provides the feasibility studies, financial plan and developed design for a permit. Nevertheless, there were many revisions related to the design. After that, the client makes a first payment before proceeding to the next step.

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Entering Design Engineering Detail stage, the company provides the plant site and building design plan that consider all aspects of finishing and materials. The problem that often occurs is design revisions and budget, especially on the finishing and material changes. The next stage is the construction; the company develops detailed drawings for construction purposes. Many project output in a limited time is an obstacle in productivity. Thus, the company must hire workers by an outsourced system. The company also provides the selected contractor before the construction process begins.

After all the Design Engineering Detail are completed, and the contractor has been selected, the next step is to start construction. It often happens in almost every project that the clients change the finishing material to minimize the budget which causes the construction process to be hampered and affect the company's productivity. At last, the company does site supervision once a week and provides detailed drawings for the contractor if needed.

The last step is the final project; the company provides the final design book to clients consists of all working progress, detailed engineering and plant site drawings, and financial summary. In summary, problems often occur in almost every stage of the business analysis process. However, the most significant and frequent problem is the disruption project productivity and construction delay due to the client's financial condition. There are often changes in financial company who want to fund at lower prices which cause differences between the results and the initial design concept.

## **II. METHOD**

### **Value Proposition**

The value a company promises to deliver to customers should they choose to buy their product. A value proposition is part of a company's overall marketing strategy. The value proposition provides a declaration of intent or a statement that introduces a company's brand to consumers by telling them what the company stands for, how it operates, and why it deserves their business.

It consists of two parts: the customer segment and value proposition. This diagram aims to determine the product's value based on consumer behavior to produce products according to market needs. To explain market needs, the researcher uses customer analysis data obtained from the evaluation results of communication between PT EML and existing customers. Customer analysis is an essential strategy in a marketing plan. Companies need to

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analyze customer data regarding needs, channels, problems, and other information required to obtain effective marketing strategies.

TABLE 2: CUSTOMER ANALYSIS

Stages	Research	Contract	Implement	Closing	After Service
Goals	● Getting information	● Get design idea	● Enjoy the process	Satisfied	Network, experience
Doing	Doing feasibility studies	Deal, start payment	Analyze and Develop	Finishing the project	Nice Feedback and supervise
People	Consultant, ● Contracto, ● Governement	Admin ●	Consultant ● and Contractor	Consultat and Contractor	Return customer, customer's friends
Thinking	Design ● to increase value	● Price related services	On time delivery	The result according to plan	Should I Recommend it?
Problems	Lack of accurate data	Cannot relate between price & project details	Shifting decision of material used	Can not predict nature condition	Not all projects comply with the initial design
Experience	Curious, hesitate	Excited	Happy	Satisfied	Trust

Customer jobs consist of problems and desires that consumers want (yellow points). In contrast, customers' gains are various things that are positive and provide the benefits expected by the customer (green points) and customers' pains are the opposite of customer gains, describes all negative and risks experienced by customers (red points). The following is the Value Proposition Canvas from PT EML.

TABLE 3: VALUE PROPOSITION

Value Proposition	Customer Segment
Product and Services	Customers Job
1 Detail Engineering services	Design Functional: Find civil and energy consultant Get design idea Design to increase value

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2 New acquaintance	Social: Networking
3 Good services	Emotional: Experience & enjoy the process
Gain creators	Customer Gains
1 Various design that suitable to the site	Price related project.
2 Flexible project schedule	On time delivery
3 Provide material sample, site supervision services	The result according to the design
Pain Reliever	Customer Pains
1 Working process explanation	Cannot relate between price and project details
2 Provide possible material alternatives	Shifting decision of material used

### Reliable Analysis

In order to meet the national energy mix target of 23% sourced from new and renewable energy (EBT) in 2025 as stated in the National Energy Policy (KEN), the Government together with PT. PLN (Persero) has planned a strategy to fulfilling the aspect of *energy sustainability* by utilizing and developing renewable energy, especially the local energy potential in a wider area. Indonesia has an EBT potential of around 442,000 MW.

Government program through the Ministry of Energy and Mineral Resources The first is the creation of new markets for renewable energy through the Renewable Energy Based Industry Development (REBID) and Renewable Energy Based on Economic Development (REBED) programs. Second, encourage the increase in NRE power generation capacity by ensuring the commitment of related parties in the development of EBT Power Plants (PLT) in accordance with the RUPTL (General Plan for the Provision of Electricity).

PT EML gives engineering design based on field inspection and the investment analysis based on economic growth and government policy. Both of them will influence the budget spending and the target price. The company also will calculate industry analysis, society requirement and district growth. These analysis help the company decide how to make sure the investment pay back period.



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In the energy industry, price becomes critical in using a service. The client often has price bargaining because it is considered too expensive for the results obtained. In addition, on-time delivery in design and construction is essential because clients already have their targets that need to be achieved. Moreover, in the early design stages, the company has provided analysis to describe the project overview. Thus, the client has a view of the result that must be following the initial project.

### *1) Experiences*

PT EML helps customers complete engineering and investment analysis as part of construction process. PT EML strives to always provide the best service by realizing client's needs and wants aesthetically and functionally. Furthermore, both the company and the client can have new networking that can be mutually beneficial. For instance, the company will get more acquaintances and good references from clients, contractors, and supporting vendors. These acquaintances are also convenient to reach new potential clients. Lastly, by improving the quality of the service, it will also enhance the client experience.

In this case, the most frequent customer pain experienced is in financial problems. The client often bids on the design cost due to financial issues. Moreover, there are often economic and government policy changes, especially during the construction phase, because the material used in the design is not according to the estimated budget and causes PT EML's productivity and construction process to be hampered.

### *2) Pitching Investor*

**Pitch** is a presentation of a business idea to potential investors. People pitch a business because they need resources. If the goal is to raise startup cash, the target of the pitch is an investor. Other businesses pitch to potential customers to sell their product. Finally, some organizations pitch because they need a partner or resource to help them accomplish their mission.

It's important to remember that a pitch to an investor may not strictly seek startup capital. For example, a business may need an investment when it has an unexpected but very profitable order beyond its current capacity. Such a pitch is easier to make because investors feel far more secure with the purchase order in hand. The idea of an **Elevator Pitch** is that it's short, just like an elevator ride. If executed well, this short pitch will spark the curiosity of the client and encourage them to ask more questions. Because of its brevity, an elevator pitch works great when seeking investors.

Another type of pitch is the **Live Plan Pitch**, which relies more on visual aids than on speaking. The general idea of this pitch is to hand all the

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customer's representatives a neatly formatted single page containing relevant information such as a market summary, financial information, or related legislation. This type of pitch is particularly effective when meeting with individuals and organizations who value empirical data, such as accounting firms, financial planners, and banks. With a bit of customization, this type of pitch can be delivered to a variety of investors or customers

Based on the analysis results, PT EML found several factors that caused the project to be hampered, such as the difference between the results and the initial design due to the material changes with lower prices. In addition, bargaining on the design price is an obstacle for PT EML in maximizing its productivity. Thus, the leading cause of this problem is the client's financial condition, which affects performance and negatively impacts the parties involved, such as architects and contractors. Therefore, PT EML needs to create a new strategy in the production mechanism process as well as the payment terms system to minimize the current problems

### **III. RESULT AND DISCUSSIONS**

#### **BUSINESS STRATEGY FORMULATION**

##### **A. Proposed Financial Strategy Analysis**

Based on business analysis in previous section, originally the company is trying to pursue angel investment or making its own internal financing. Business Angel, in most cases, prefer to invest on well-known industry so they able to measure industry trend and valuation. The other alternatives which is internal financing, the company retained earnings couldn't manage to finance the investment itself, equity and debt financing will be assessed in this section. The most profitable alternative will be selected with consideration of company's business outlook and financial condition.

In this research, author will examine some financing alternatives the company can use in ordering to grow the business. The financing strategy alternatives that can be explain more is internal financing, angel financing, and debt financing. In addition, US Index analysis of the company for 10 years projected income statement will be conducted first as determinant to decide company's capital structure.

The US Index Theory was introduced by Dr. Ir. Uke Marius Siahaan, MBA as a tool and the financial parameters for assessing repayment capacity of a company, as well as a determinant to decide whether a business entity should maximize use of Debt or Equity in running the operation.

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The US Index could determine a company's ability to meet its obligation by comparing its Business Generic Profitability (BGP) to the Loan Interest Rates (I) which can be formulated as follows:

$$**US Index = Business Generic Profitability \div Loan Interest Rate**$$

Generic Business Profitability (BGP) is the result of profit margin of a company which derives from its business activities were financed by its capital either in from of debt/ loan or equity. The formula is formulated as follows:

$$**BGP = (Earnings before Interest and Taxes \div Total Assets) * 100%**$$

The concept started with the needs of capital expenditure in ordering to generate operational profit. If the capital source comes from debt then company will have obligation to bank to pay interest expense as the payment on the agreement. The loans itself could generate Business Generic Profit (BGP) a minimum of Loan Interest Rate (I) so the company could meet to cover its loan interest obligation to the bank.

To maximize its operating profit, the company should take the optimal decision on its capital structure whether financed by equity or debt. As the result, the financing decision should generate greater profit than the operating cost and financial cost which is called leverage. According to the result of US Index values, the signs can be defined as follows:

1. US Index > 1 □ company should go leverage
2. US Index < 1 □ company should go equity
3. US Index = 1 □ company is free to choose either go leverage or go equity.

The first financing strategy is internal financing. Internal financing is a fund that is initiated by the firm in its regular course of performance such as retained earnings. The second financing strategy uses an angel investor (also known as a business angel, informal investor, angel funder, private investor, or seed investor) is an individual who provides capital for a business start-up, usually in exchange for convertible debt or ownership equity. Angel investors usually give support to start-ups at the initial moments (where risks of the start-ups failing are relatively high) and when most investors are not prepared to back them. Angels, in most cases, provide capital for start-up or early stages businesses and lack operational plans. Business angels typically invest within a period of 3-7 years before exiting the investment or the firm's failing. The third financing strategy is debt financing using bank loan. Bank will provide

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the agreed amount of money with specific interest rates and receive the loan principal over a period of time. This alternative is trying to calculate with 65% of bank loan and 35% equity.

### IV. CONCLUSION

The following is a summary of the three financing alternatives that can be applied in the project. This analysis is based on the calculation of the current interest rate. Based on these analysis, Debt Financing (Alternative 3) is viable choice for financing the project.

TABLE 2: Alternative Financing Comparison

Variables	Internal Financing (Alternative 1)	Angel Investing (Alternative 2)	Debt Financing (Alternative 3)
WACC	9,7%	8%	6,8%
Cost of Equity	10%	11,9%	12%
Cost of Preferred Stock	-	50%	-
Cost of Debt	-	-	6%
Payback Period	8 year	8 year	7 year
NPV	\$1.146.760	\$3.709.149	\$6.366.186
Profitability Index	1,1	1,3	1,6
IRR	11%	11%	12%
US Index	0,65	0,76	1

Business situation analysis does not ensure the expansion project will be profitable. Giving better justification, feasibility study of capital structure analysis is assessed. The conclusion of this research is listed below.

1. The initial investment requires for this project is \$11.324.252 which consists of investment on land, plant, equipment, intangibles, and initial working capital.
2. There are three financing alternatives proposed on this research. First, Internal Financing will use its own equity to fund this project. Second is Angel Investing where company will maintain its capital with angel investment as many as 100%. The third alternative is Debt Financing where 65% is taken from bank loan and 35% equity.

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3. Based on the comparison, it shows alternative 3 (Debt Financing) generating more benefits. The alternative gives result in NPV for \$6.366.186; Profitability Index (PI) for 1,6; Internal Rate of Return (IRR) for 12%; Payback Period (PP) for 8 years and one month. This is also proven with US Index result above 1 with result for 1. It means that the company needs to do leverage for financing expansion project. Total Fair Market Value of the company is \$12.872.212.
4. Alternatives 3 will enhance company's value in several ways such as diversification in financial risk, tax benefits on interest payment, secured retained earnings, fast funding disbursement, and keep shareholder's equity remain balanced.

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