INVESTMENT FEASIBILITY STUDY OF PT HARDAYA MINING ENERGY SEBAKIS ON SITE COAL LABORATORY IN 2022

Febrianto[1], Ali Ridho[2], Ken[3]

[1,2,3] Department, Institut Teknologi Sepuluh November, Indonesia

History Article

ABSTRACT

PT Hardaya Mining Energy (PT HME) as a coal supplier in Indonesia with a quantity of 3 million Metric Tons (MT) per year is still testing coal samples by sending a large number of samples per day to PT Sucofindo Tarakan Branch and also other PT Sucofindo Branches in the Kalimantan region which costs a lot of additional shipping costs and makes the certificate issuance time long, so PT HME plans to work with PT Sucofindo Tarakan Branch to procure PT HME On Site coal laboratory. The purpose of this study is to assess the financial feasibility of PT HME's On Site laboratory procurement investment. Quantitative descriptive research method is used in this research to find the amount of investment feasibility value based on the Net Present Value (NPV), Internal Rate of Return (IRR), Payback Ratio (PP), and Break Event Point (BEP) formulas. The results of this study show an NPV value greater than zero, the IRR value is at a percentage of 55%, PP produces a value of 0.81 years or 9.76 months, and has a BEP value that increases every year. Thus, PT HME's on-site coal laboratory investment is feasible.

*Corresponding author email: ken.tunggadewa@gmail.com

INTRODUCTION

The need for energy in Indonesia continues to increase along with increasing economic growth and increasing population (Khoiria et al., 2016). In this case, the government took concrete steps in national energy planning by issuing Presidential Regulation of the Republic of Indonesia No. 22 of 2017 concerning the General Plan of National Energy (RUEN). This plan is used as a guideline to provide direction for national energy management to realize energy independence and national energy security to support sustainable national development. The role of energy is very important for increasing economic activity and national resilience. Energy is managed based on the principles of benefit, efficiency, justice, increased added value, sustainability, community welfare, preservation of environmental functions, national resilience, and integration by prioritizing national capabilities (Government of Indonesia, 2017).

One of these energy sources is coal, coal is one of the most important energy sources for Indonesia (Nathanael, 2021). Coal is one of the alternative energy sources in Indonesia which has quite a large number of resources and reserves (Avicenna et al., 2019) . The role of coal as a substitute energy source for oil and gas is getting bigger, especially to increase the rate of development and economic growth. Therefore, Indonesia's coal production and consumption will continue to be increased, especially as direct fuel in power plants, large and medium industries, to household industries (Budiman &; Hafram, 2017).

Before coal can be used, various types of tests must first be carried out to determine the quality of the coal to comply with applicable standards. Coal quality is also influenced by the geological conditions of a mining site, including high quality, medium quality, and low quality coal (Prabowo, 2021). These various types of tests are part of coal superintending activities, these activities are a unity between measuring the quantity and quality of coal that has a financial impact on both suppliers and users. The accuracy of quantity and quality data initially affects operational activities and eventually has an impact on financial aspects. (Huseini et al., 2018)

PT Hardaya Mining Energy (PT HME) located in Purchasegan, Sebuku, Nunukan Regency, North Kalimantan is an affiliate of Central Cipta Murdaya Group which has a mining license and RKAB from the Ministry of Energy and Mineral Resources of 3 million Metric Tons (MT) per year in 2022. This causes PT HME to require daily coal quality and quantity testing for quality control of its production, fulfillment of domestic coal needs, and export needs. In this case, the fulfillment of the laboratory is entrusted by PT HME to PT Sucofindo Tarakan Branch North Kalimantan as an independent institution providing Superintending Quantity and Quality Analysis Services for transparency and accurate data. PT Sucofindo Tarakan Branch itself has Accreditation from KAN for SNI ISO / IEC 17025: 2017 with LP Number -760-IDN as an accredited Coal Laboratory.

So far, PT HME is still testing coal samples by sending large quantities of samples per day to PT Sucofindo Tarakan Branch and also PT Sucofindo other branches in the Kalimantan region which requires considerable additional shipping costs and makes the certificate issuance time long. This is because PT HME does not have an Independent Laboratory at the PT HME Site. Therefore, PT HME plans to cooperate with PT Sucofindo Tarakan Branch to procure PT HME's On Site Laboratory to avoid complaints from customers. The procurement certainly requires considerable investment costs, so sufficient consideration and investment feasibility studies are needed.

In making a large investment, of course, requires a very detailed analysis in order to achieve a high return value (Rosyid &; Nurrajendra, 2022). Investment feasibility studies are not only needed by business initiators but also able to provide benefits by several parties who need feasibility with various interests (Faradiba &; Musmulyadi, 2020). For business people to benefit from the conclusion of a business feasibility study whether this business is feasible to run and the investment made is promising (Bhakti et al., 2021). Given the importance of maintaining the services that have been provided to customers, it is proposed to conduct the feasibility of investing in PT Hardaya Mining Energy's on-site coal laboratory.

In conducting trials, coal samples to be studied must be sent to Tarakan branch laboratories and other branches in the Kalimantan region which can cost shipping costs and certificate issuance becomes hampered. So it is necessary to procure laboratory testing equipment in order to improve services and there are no complaints due to the issuance of long certificates. Based on the description above, it is necessary to make the feasibility of investing in PT Hardaya Mining Energy's on-site coal laboratory. This study was conducted to determine the feasibility of investment with financial aspects in this coal laboratory.

METHODS

This study uses quantitative descriptive research methods in finding the amount of investment feasibility value based on a formula that determines the feasibility of investing in PT Hardaya Mining Energy's on-site coal laboratory. The analysis is processed to obtain *Net Present Value (NPV), Internal Rate of Return (IRR), Payback Ratio (PP), and Break Even Point (BEP),*

The first thing to do in this research is to identify problems in coal laboratory investment, then conduct a literature study to determine the feasibility of this investment.

Investment criteria are used to measure the benefits obtained and costs used from a project. (Ichsan et al., 2019). Investment is the activity of investing capital and providing benefits in the future. In conducting research, there are several criteria that can be used in calculating investment feasibility.

Net Present Value.

This investment criterion is widely used to gauge whether the investment is feasible or not. Net Present Value is the sum of all future cash to determine present value (Arshad, 2012). The use of present value is to describe the initial calculation time or zero (0) year period in an investment's cash flow. To calculate the NPV, data is needed about estimated investment costs, operating costs, and maintenance as well as estimated benefits from the planned project (Zakiyah, 2018). An investment can be said to be feasible or not, it requires a certain criterion with the NPV method, namely:

If : NPV > 0It means that the investment is feasible.

NPV < 0 It means that the investment is not worth it.

But whether or not an investment plan is feasible is not the final decision of an investment program, often certain considerations also influence the decision to be taken (Drs. M. Giatman, 2006).

Below is the formula for calculating NPV (1).

$$\text{NPV} = \; {}^{-}\sum_{t=0}^{n} \frac{(C)^t}{(1+i)^t} \sum_{t=0}^{n} \frac{(CO)^t}{(1+i)^t} \tag{1}$$

NPV is net present value, (C) t is cash inflow year t, (CO) t is cash outflow year t, i is the relevant *discount rate* used to find *NPV* and n t is age t.

If the NPV is positive, then the project proposal can be accepted, and the higher the NPV price the better, but if the *NPV* is negative , then the project proposal is rejected. If *NPV* 0 means normal (Wardana et al., 2021).

Internal Rate of Return.

Internal Rate of Return is used to explain whether the investment plan being made is quite attractive when viewed in terms of the predetermined rate of return (Fitria & Wahyudi, 2018). IRR is also referred to as the rate of return on capital. In this case the rate of return on investment can be thought of as the rate of return on net investment in a project (Anggita, 2020).

The use of this IRR method is used if there are 2 or more investments. To find out which investments are considered good with IRR calculations, the investment that has the highest IRR value is good. Here is the IRR calculation formula (2).

$$\text{IRR} = \; + \; \text{x} \, ()_{i_1} \frac{NPV_1}{NPV_1 - NPV_2} i_1 - i_2 \tag{2}$$

IRR = Internal Rate of Return

i_1 = interest rate yielding NPV+

i_2 = interest rate that yields NPV-

NPV1= NPV+

NPV2= NPV-

Payback Period.

payback period is a method to find out when the return of investment funds that have been issued (Widiarti, 2020). Payback Period basically aims to find out how long (period) the investment will be able to be returned when the condition of return principal (*break even point*) (Drs. M. Giatman, 2006).

If the cash flow benefit and cost components are annual, the formula becomes:

$$k = \frac{Investment}{Annual\ Benefits} \; x \; Time\ Period \tag{3}$$

Decision criteria.

To find out whether an investment is worth it or not, certain criteria are needed. In this Payback Period method the investment plan is said to be feasible:

If k ≤ n and vice versa.

k = Number of Return Periods

n = Investment Life.

Break Even Point.

Break even point is a calculation process carried out by a management to find out the principal breakeven point where the state of the company experiences neither profit nor loss or income and costs equal to zero (Aminus & Sarina, 2022). Thus, in this analysis, there are at least three elements that must be

considered, namely, costs, activity volumes, and profits (Utami &; Mubarok, 2021). The company is basically looking for profit besides that it also has a goal for the development of the company, the company is trying as much as possible to avoid losses or bankruptcy or the company is trying not to lose even though it doesn't make a profit, in a break even point state (Worontika, 2018).

This analysis is also an indicator to illustrate that production costs can be covered by revenue from sales, where total profit and loss equals zero (0). This means that the company is in a position of return on investment.

Here is the BEP calculation formula:

Break Even Point = or $\frac{FC}{\frac{P-VC}{P}}$

Break Even Point = $\frac{FC}{1-\frac{VC}{P}}$

FC = Fixed Cost

VC= Variable Cost

P = Sales Results.

RESULTS AND DISCUSSION

In conducting fast and accurate coal testing, the company felt the need to procure coal laboratory testing equipment. So that there is no delay in providing test results reports to customers. Based on this explanation, it is necessary to conduct a feasibility study on laboratory investment. This study was conducted to find out whether this investment is feasible or not in terms of financial aspects. The following is a feasibility study of PT Hardaya Mining Energy's on-site coal laboratory investment at the sebakis site up of PT Sucofindo Tarakan Branch.

1. Cost of Investment

Investment cost is the cost used to invest in the procurement of coal laboratory equipment. The following table 1 is the equipment needed in coal laboratory investment.

Table 1. Investment Cost Calculation

No.	Description	Price (Rp)
1	Jaw Crusher	77,600,000
2	Hammer Crusher	82,500,000
3	Rotary Sample Divider (RSD) 60 kg	50,000,000
4	Rotary Sample Divider (RSD) 40 kg	86,600,000
5	Big Drying Oven	174,500,000
6	Raymond Mill	52,000,000
7	HGI Machine	138,500,000
8	Rotap Shaker	102,720,000
9	Coffee Mill	86,400,000
10	Rotary Sample Divider (RSD) PT 100 gr	165,000,000
11	Analytical balance 200 gr	42,000,000
12	MFS Oven	102,900,000
13	Furnace Ash	115,500,000
14	Furnace Volatile Matter	115,500,000
15	Furnace AFT	588,000,000
16	Total Sulfur Leco	792,750,000
17	Caloriemeter Value	430,500,000
18	Memmert Oven	50,925,000
	Total	3,253,895,000

Table 1 is the calculation of the investment cost of procurement of equipment which consists of 18 items, which are used in coal laboratories. With a total coal laboratory investment of Rp.3,252,895,000, it is expected that with this value there will be no more complaints from customers due to the long certificate issuance time.

2. Cash Flow

Income and expenditure data are needed to calculate cash flow projections from 2023 to 2027. Here are cash flow projections from 2023 to 2027.

Table 2. Cash Flow Projections

Year	Inclusion	Expense	Profit	Profit After Tax
2023	9,895,294,347	5,898,680,814	3,988,987,248	2,991,740,436
2024	7,800,000,000	3,165,641,195	5,094,513,407	3,820,885,055
2025	8,940,000,000	3,621,875,557	6,006,200,924	4,504,650,693
2026	9,640,000,000	3,969,522,889	6,476,004,482	4,857,003,361
2027	10,340,000,000	4,469,022,650	7,827,969,800	5,870,977,350

*in rupiah

Cash income in table 2 is obtained from receiving payments. Meanwhile, cash expenditure consists of direct operational costs, administrative costs and VAT tax payments of 11% and PPH tax of 25%.

3. Net Present Value (NPV)

After calculating investment costs and cash flow projections, the next step is to calculate the net present value based on the NPV formula (1). Here is table 3 which is the calculation of present value from 2023 to 2027.

Table 3. Net Present Value Calculation

Year	Expense	Inclusion	Net Cash Flow	Rate 12%	Present Value 1	Rate 30,14%	Present Value 2
2023	5,898,680,814	9,895,294,347	3,996,613,533	0.89	3,568,404,941	0.77	3,071,127,973
2024	3,165,641,195	7,800,000,000	4,634,358,805	0.80	3,694,482,466	0.59	2,736,536,047
2025	3,621,875,557	8,940,000,000	5,318,124,443	0.71	3,785,335,934	0.45	2,413,102,517
2026	3,969,522,889	9,640,000,000	5,670,477,111	0.64	3,603,690,717	0.35	1,977,163,744
2027	4,469,022,650	10,340,000,000	5,870,977,350	0.57	3,331,350,218	0.27	1,573,037,950
	Total Present Value				17,983,264,275		11,770,968,230
	Investment				3,253,895,000		3,253,895,000
	Net Present Value				14,729,369,275		8,517,073,230

*in rupiah

Table 3 above is the result of calculating the net present value with a rate of 12% and also the net present value with a rate of 30.14% found that the net present value 1 (NPV 1) 14,729,369,275 and net present value 2 (NPV 2) is Rp 8,517,073,230 from the total present value minus the investment value. The value of the net present value is showing a positive value, meaning that this investment is feasible and benefits from the procurement of coal laboratory equipment on site PT Hardaya Mining Energy at the site up sebakis PT Sucofindo Tarakan Branch.

4. Payback Period (PP)

This Payback Period calculates how long the investment in the procurement of laboratory equipment has paid off. Here is the formula used in calculating the payback period.

$$k = \frac{Investment}{Annual\ Benefits} \ x\ Time\ Period$$

$$k = \frac{3,253,895,000}{3,996,613,533} \ x\ 1\ Year$$

$$k = 0.814163034\ Year = 9.76\ months$$

Based on the payback period calculation above, this investment will return on investment after 10 months.

5. Break Even Point

Break even point is where income and expenses in the company are at the same point. This means that total income is equal to total expenses. Here is table 5 of the results of the break even point calculation.

Table 5 Break Even Point

Description	1st Year	2nd Year	3rd Year	4th Year	5th Year
Sales Results	6,450,000,000	7,800,000,000	8,940,000,000	9,640,000,000	10,340,000,000

Variable Costs	1,706,746,812	2,131,628,352	2,484,950,231	2,679,401,120	3,094,392,450
a.　　　Taxes					
-　　　PPH 25%	997,246,812	1,273,628,352	1,501,550,231	1,619,001,120	1,956,992,450
-　　　PPN 11%	709,500,000	858,000,000	983,400,000	1,060,400,000	1,137,400,000
Fixed Costs	469,176,002	520,263,543	571,801,096	648,485,115	690,829,882
a.　　General and Administration Fees					
-　　Salaries and Wages	140,000	5,550,450	5,677,973	5,811,871	5,952,465
-　　Allowances	173,002	963,793	998,894	1,036,591	1,077,099
-　　General and Other Administration Expenses	468,863,000	513,749,300	565,124,230	641,636,653	683,800,318
Break Even Point	637,997,823	715,912,062	791,922,911	898,111,875	985,863,632

*in rupiah

With the calculation in table 5, the break even point value from 2023 to 2027 is obtained. Where each year total income equals total expenditure at different break even points. Every year the value of the break even point increases, it can avoid losses.

CONCLUSION

The results of the feasibility study of investing in coal laboratory equipment are feasible by being calculated financially. This is because this study has a net present value with an interest rate of 12% of IDR 14,729,369,275 and a net present value with an interest rate of 30.14% of IDR 8,517,073,230. This means that the net present value is greater than zero. After that calculate the value of the Internal Rate of Return, with this calculation obtained the return for this investment is 55%. With that, the internal rate of return is 55%. This means that this investment has an efficiency rate of 55%. The higher the level of efficiency means that the investment is very profitable. Then for the payback period results on this coal laboratory equipment investment, get a value of 9.76 months or approximately 10 months. This shows that this investment in coal laboratory equipment within 10 months has returned on investment and then in 11 months onwards this investment will get a profit. For break even points, the result of the calculation is to increase every year. This means that the value of the break even point that increases every year means that the company avoids losses. Thus, this investment feasibility study using the parameters of net present value, internal rate of return, payback period, and break even point provides feasible results for investing in PT Hardaya Mining Energy's on-site coal laboratory in site up sebakis PT Sucofindo Tarakan Branch.

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