ANALYSIS ON THE HIGHEST AND THE BEST USE AS AN ALTERNATIVE STRATEGY OF ASSET UTILIZATION

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Abstract: PT PLN (Persero) is an Indonesian government-owned corporation that provides electricity needs for both the Industrial and Community sectors. In accordance with the Regulation of the Minister Number: PER-13/MBU/09/2014 about the utilization guideline of State-owned fixed assets Article 1 that the Board of Directors must prepare a list of fixed assets that are lacking and / or not optimally utilized. Currently, PT PLN (Persero) has an asset in the form of vacant land that has not been optimally utilized.

In order that the vacant land can be used optimally then it is necessary to do Highest and Best Use analysis on the land. Highest and Best Use analysis aims to identify the use of the most profitable and competitive property for the land. The Highest and Best Use analysis uses four criteria that are physically possible, legally permitted, financially feasible, and have maximum productivity.

From the results of the study obtained results for the construction of gas power plants with a payback period value of 2 years and 7 months, indicating a positive value for NPV while the IRR value of 28.69% and PI of 1.91. It can be concluded that the investment options can be executed.

Keywords: Highest and Best Use Analysis, PLTG, Land Valuation

1. INTRODUCTION

Currently PT PLN (Persero) of North Sumatera Region has assets in the form of vacant land that has not been optimally utilized and requires operational costs to perform maintenance on the assets in the land.

Amin. (2015) explained that HBU Study activities ideally are part of a work package in order to optimize assets. This activity is intended to find out: sorting out which assets have been optimized and which have not been optimally utilized, knowing the most optimum utilization options, knowing the most beneficial cooperation pattern for the asset.

PT PLN (Persero) has several alternative uses of vacant land are as follows: PLTD Development, PLTG/MG Development, Power Plant Construction, Office Building, Warehouse Development, Flats, and Substation.

Highest and Best Use Analysis then written analysis HBU is a concept that is very well known in the field of real property asset management, both in terms of asset optimization and asset valuation.

Of the several alternatives for land use, it is still necessary to deepen the best use analysis to determine which type of plant is most suitable, feasible and can produce maximally at the location of the land.

2. LITERATURE REVIEW

2.1 Understanding Highest and Best Use Concepts

Highest and Best Use Analysis HBU analysis is a well-known concept in real estate asset management, both in terms of asset optimization and asset valuation. HBU analysis is an analysis of the best and highest use of a vacant land or land that is considered as vacant. This analysis includes four main points: physical feasible analysis, legally permissible analysis, financial feasibility analysis, and maximally productive analysis. A property is said to have met the criteria of HBU where it is physically possible, permitted by regulation, financially feasible, and can provide maximum results.

Dachyar, M. (2012) conducts research on feasibility analysis of investment and risk of Indramayu power plant development project from financial aspect by considering interest rate of loan in Japanese currency. The calculation of capital budgeting made NPV value of Rp 36 trillion and IRR of 9.03%. In addition, the simulation of monte carlo which produces an average NPV is Rp 29 trillion with a probability of producing NPV with minus value of 26.62%.

2.2 Appraisal Approach

According to Stephen F. Fanning (2005), to perform the analysis of Highest and Best Use used analytical tools as follows:

1. Market data approach (Market Data Approach)
2. Cost Approach (Cost Approach)
3. Income Approach (Income Approach)

Pomykacz, M et al. (2014) conduct an assessment of power generation, because it is a unique and interesting thing. Power plants can be worth billions of dollars, and have an important role in an infrastructure. Different technologies are applied at the plant. The use of a plant valuation also has diversity, from acquisitions, financing purposes, regulation, litigation, or property taxes, to the Internal Revenue Service (IRS) or Securities and Exchange Commission (SEC) reporting.

2.3 Standard Value in Asset Rating

Market Value is defined as the estimated amount of money on the date of valuation, which can be obtained from a sale and purchase transaction or the exchange of a property (Fanning, 2005).

The Cost Approach is based on the amount of costs incurred to create or build a new one of each major component, building materials and facilities. The value of the property is obtained from the multiplication of the building area with the construction cost per square meter. The property value of the sum of the value of the land and the value of the building obtained from the new construction or construction is reduced by depreciation.

The Revenue Approach, also called the investment approach, is one approach that can be used in the valuation of the resulting property.

2.4 Indicators for Financial

Indicators for financial incentive variable are electricity cost savings, water cost saving, home value, rental value, and the willingness to spend high cost for green home investment to get long term benefit.

For green behaviour variable, the indicators are behavior about the used of friendly material, energy efficient transportation, preference to be in open green spaces, energy saving, efficient use of the goods, preference using electronic documents than papers, saving electricity, protecting the environment, buying goods with less garbage, and like to participate in protecting the environment. (Fachrudin, K and Fachrudin, HT. 2017)

3. FRAMEWORK OF RESEARCH THINGKING

In practice, the determination of the value of the vacant land is done using the market approach method, this comparison approach considers the sale of similar or substitute property and related market data, and generates the estimated value through a comparison process. In general, the assessed property (the valuation object) is compared to a comparable property transaction, either existing or the property still in the selling offer stage of a buying and selling process (SPI, VI Edition 2015).

The framework is divided into several parts of the analysis steps presented in the analysis diagram below:

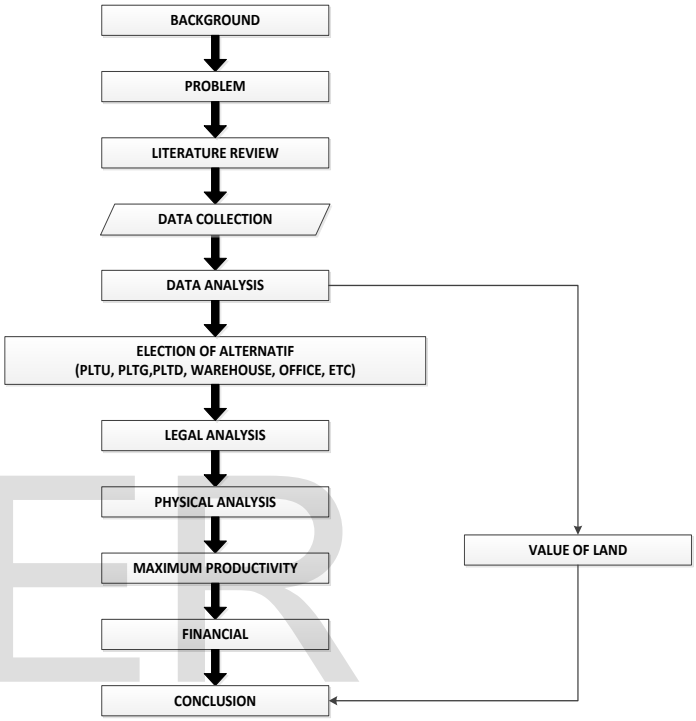

Figure 1. Research Flow Chart

4. RESEARCH METHODS

Problem Identification is a process that conducted the information. It's the first step to start the study, which can be done in many ways, such as reading literature review, acquiring information from the internet and observing realcondition and having discussion with the project officer, lecture, and tutor. After that the researcher starts to identify the problem exiting in which would be formulated into the research question. The research question is highly related with the research background.

Location and Time of Study

The location of this research was conducted on the land owned by PT PLN (Persero) in Paya Pasir, Rengas Island, Medan Marelan, Medan, North Sumatera which is currently not used maximally, so research needs to be done to optimize the land asset.

Data Sources

The data used in the form of primary and secondary data. Primary data is obtained from the survey results, also through the process of observation and direct interviews to the management of PT PLN (Persero) as well as stakeholders related to the core business in PLN.

Data Analysis

Data analysis on the alternatives chosen in this study using Highest and Best Use principles are:

a. Analysis of alternative types in terms of legal aspects. Things to review are (Zoning), building codes and environmental regulations, such as those concerning clean air, clean environment, clean water, and security.
b. Analysis of alternative types viewed from the physical aspect. This analysis has several things examined to determine whether or not the alternatives under study of the size of the land area, shape, public utility, accessibility to the site location to be drawn conclusions whether or not the selected alternatives to the available land.
c. Analysis of alternative types viewed from the aspect of maximum productivity. Of the financially feasible uses, the highest yielding residual usage consistent with the market-guaranteed rate of return for such use is the highest and best use. So it can be concluded an alternative is said to have maximum productivity if it has the highest land value.
d. Financial Analysis (Capital Budgeting). This analysis will determine whether the alternatives can be implemented or not and have a profit or rate of return so as not to cause a loss if the project is run. Furthermore, this investment feasibility assessment is called Capital Budgeting technique, Capital Budgeting is the whole process of planning and decision making regarding the expenditure of funds where the return period of funds exceeds one year (capital expenditure). These expenses include for the purchase of plant investments, ie buildings, machinery, and expenditures for long-term advocacy projects, research and development.

5. RESEARCH AND DISCUSSION RESULT

5.1 Analysis of market price forecast of land without development

Determination of the value of vacant land in this study was conducted by the method of determining the value based on market price when done this research to the location around the place of the study. The value obtained from the market price survey is Rp 1.535.592,- per m^2.

5.2 Analysis of Alternative Sues Based on the Perception of Potential Users

Based on survey results through questionnaires given to stakeholders as well as stakeholders related to the core business of PT PLN (Persero) there are 2 land use alternatives based on the highest number of voters in the following ranking order:

1. Use as Diesel Power Plant (PLTD).
2. Use as Gas / Gas Engine Power Plant (PLTG / MG).

The results of the interview through the questionnaire distribution are then reviewed using Highest and Best Use analysis, so that the alternative results obtained can be justified in terms of legal, physical, financial and productivity to the maximum.

5.3 *Highest and Best Use* Analysis of Legal Aspects

In accordance with Local Regulation of Medan City No. 13 of 2011 on Spatial Planning of Medan City Year 2011-2031, that space of Medan City area one of them is Energy System Plan. This is in accordance with the contents of Chapter III, First Section of Article 13 Paragraph (1), part c of the rule. In Part Four of Chapter III (System of Energy Networks), Article 25 Paragraph (2) states that the energy network system consists of electric power and oil and gas pipelines. In Paragraph (3) of Article 25, the electric power network consists of electricity generation and transmission lines, whereas in Paragraph (4) it is mentioned that the power plant established is Gas / Gas Engine Power Plant (MG) and Power Plant Steam (steam power plant), diesel and in paragraph (4) Transmission Network in the form of substation can be built on the area.

The conformity of the allotment as described above is also mentioned in the Letter of the Head of the Office of Spatial Planning of Medan City to the General Manager of PT PLN (Persero) Development Master Units I, numbered 640/4423 dated 28-05-2015 regarding Explanation on Spatial Information (attached), ie at point 2 mentioned that the

appropriate land allocation according to RSSW. Because the construction site is located on the land owned by PT PLN (Persero) it self, the construction of power plant is still possible at that location, while at point 1 in the letter the land can be used as housing.

5.4 Analysis of Highest and Best Use of Physical Aspects

a. The shape, contour of the land

From the field observation, the land is square, and the contour of the land is quite evenly and slightly wavy. The initial condition of empty land is an empty land planted with shrubs or weeds, and there are puddles when it rains. Land maturation is required for the site.

b. Activities around the land location

The highway, about 50 m from the entrance gate of Medan Power Sector (Paya Pasir) there is a road that traffic is rather crowded, that is Jln. Titi Pahlawan.

For alternative as Gas / Gas Engine Power Plant (PLTG/MG) in accordance with above layout condition, PLTG can be built with maximum capacity of 241 MW, the reference of land layout is obtained from Exsisting Power Plant in Arun area, with total area of 4, 8 Ha, including the reforestation area. As for the fuel plan using Natural Gas. Natural gas sources are planned from PT. Perta Gas, which will be flown from Belawan Installation to PLTG/MG MPP Paya Pasir location through gas pipeline installation.

For alternatives as a power plant this can not be built because the area of land owned is only 5 Ha (50.000 m²) whereas for the development of steam power plant (2x7) MW at least requires 12 Ha of land, the reference of PLTU Tanjung Balai Karimun Kepulauan Riau, due to the allocation of coal storage and coal dust.

The effective land area that can be used is 60% because 40% for the room of the mechanical equipment to be used. Of the total land use area of 4.5 Ha. So 60% that can be used as a warehouse that is equal to 27.000 m²

The area of effective land used for the alternative as the substation is ± 10,000 m², so with the area of 50.000 m² observed, it is not effective in the utilization of space. So the alternative as the substation is less able to be utilized optimally.

5.5 *Highest and Best Use* Analysis from Maximum Productivity Aspect

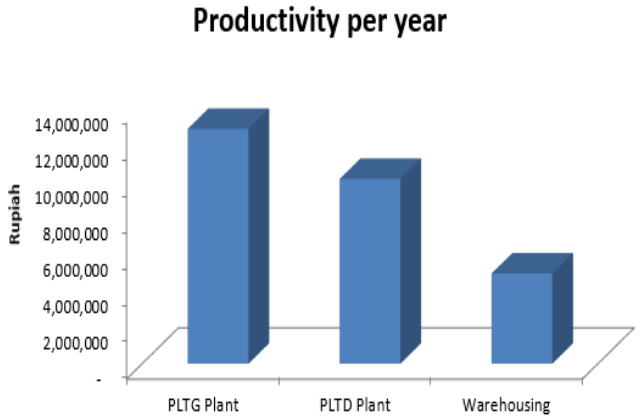

Figure 2. Graphics Productivity of each alternative

5.6 Analysis of *Highest and Best Use* from The Financial Aspect

a. Investment costs

For an alternative as a PLTG, the land can be built capacity of PLTG of 240 MW with the following cost details:

Table 1. Investment Cost of Gas Power Plant

No	Description Work	Cost EPC (Rupiah)
1	Civil works	293,342,533,386
2	Mechanical Work	1,210,523,716,019
3	Electrical Works and Control Instruments	689,909,663,705
4	Procurement of Operations and Maintenance	547,809,886
5	Miscellaneous expense	8,829,035,026
	Total Investment Cost (Not Including Tax)	2,203,152,758,023

Source: Data Processing of Contract Document Sumbagut Peaker Power Plant between PT PLN (Persero) and Consortium of PT Wijaya Karya-TSK-Sewatama

b. Income

The revenue for an alternative to PLTG / MG development is the Electricity Sales Tariff to customers 1467.28 Rp/kWh (January 2017) and has a periodic increase of 10% (per year) for a period of 20 years.

c. Expense spending

Plans for expenditure on alternatives as PLTG / MG are as follows, with an escalation of 3%

Operation and Maintenance per year. For a useful life of 20 years:

Table 2. Operational Cost of PLTG / MG per Kwh

No	Description	Cost Rp/kWh
1	Fuel Costs	790.12
2	Operation and Maintenace Cost (Fixed)	80.50
3	Operation and Maintenace Cost (Variable)	34.50
	Total	905.12

Source: Results of data processing

5.7 Financial Analysis

In the financial analysis will be calculated the cost of investment, income and expenditure of business activities of each alternative utilization that existed by the method of Capital Budgeting and LEGC calculation scheme (Levelized Electricity Generating Cost) by taking into account the discount rate of 10.44% then obtained the following results :

a. Payback Period

This method shows the initial payback period to be performed. The period of return on investment capital for alternative land use as Gas / Gas Engine Power Plant can be seen in table :

Table 3. Data *Payback Periode*

Description	PLTG Plant
Payback Periode	2 years 7 months

Source: Results of data processing

From the calculation then obtained Payback Period value for alternative land as a gas power plant, ie for 2 years 7 months so it can be concluded that the selection of these alternatives can provide benefits if done development. This can be seen from the duration of utilization or use of gas power plants is within 20 years while the payback period is for 2 years 7 months.

b. Net Present Value (NPV)

NPV calculation results show that for alternative development Gas power plant has value of NPV that is Rp 2.818.837.070.855.-

Table 4. NPV data for 20 Years

Description	PLTG Plant (Rp)
NPV for 20 years of operation	2.818.837.070.855,-

Source: Results of data processing

NPV has a positive value of Rp 2.818.837.070.855,- which means that the alternative development of Gas / Gas Engine power station is feasible to run. NPV is greater than zero meaning that the investments made provide benefits to the company and those activities can be run. The advantages of this NPV method are to take into account the time value of money, take into account the cash flows during the project's economic life, and take into account the value of the remaining project.

c. Internal Rate of Return (IRR)

IRR is an indicator of the level of efficiency of an investment. A project or investment can be done if the rate of return (rate of return) is greater than the rate of return when investing elsewhere (interest on bank deposits, mutual funds, etc.). The calculation result of Internal Rate of Return (IRR) for alternative as gas power plant is as follows:

Table 5. Internal Rate of Return (IRR)

Description	PLTG Plant
IRR Value	28.69%

Source: Results of data processing

d. Profitability Index

Calculation of Profitability Index for all alternative land use projects using the formula:

$$PI = \frac{PV(Future.Cash.Flow)}{Initial.Investment} = 1 + \frac{NPV}{Initial.Investmet}$$

For the Profitability Index score for all land use alternatives can be seen in Table 5

Table 6. Value of Profitability Index (PI)

Description	PLTG Plant
PI Value	1.91

Source: Results of data processing

Based on the calculation it can be seen in the table above that for alternative as Power Plant Gas / MG above has value Profitabilty Index (PI) is greater than 1 (one) so it can be concluded that the development alternative Gas Power Plant is feasible to be implemented.

6. CONCLUSION

Based on Financial Analysis where for alternative utilization of Gas Power Generation with the investment value for the construction of the PLTG is Rp. 2,203,152,758,023.- gives the NPV result of Rp 2,818,837,070,855, - for a period of 20 years give payback period value of 2 years and 7 months, indicating a positive value for NPV while the IRR value of 28.69% and PI of 1.91.

Based on legal and physical aspects criteria as follows Local Regulation of Medan City stated that the area is an area for industry so that alternative of power plant development is possible. The location is in an industrial area, which has good potential and a strategic location with accessibility that is easy to reach, public utilities complete and allow developed as a commercial property.

From the results of research conducted by the author about vacant land owned by PT PLN (Persero) located in Paya Pasir, Rengas Village, Marelan District, Medan City, North Sumatra Province, it can be concluded that the alternative development of PLTMG can be carried out according to the high and best analysis use.

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