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Analysis of the Highest and Best Use Method of Jetty Development and Coal Unloading System Facilities in PT PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera (Case Study of PLTU Pangkalan Susu Unit #3 and Unit #4)

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Abstract: *With an increase in peak load with an average of 7.43% per year in accordance with the general plan for electricity supply (RUPTL) 2019-2028, PLN is required to be able to meet the needs of installed electricity capacity, both PLN power plants and independent power producer scattered in Sumatera especially in Sumatera Utara. On the one hand, PLN has a power deficit with a peak electricity load in Sumatera Utara until 2019 reaching 2,046 MW if the peak load is compared to the overall power plant by applying a reserve margin of 30%, PLN from Province of North Sumatra is still experiencing a power deficit of around 351,82 MW in 2020. In this study, highsest and best use method was used to assess the combinations associated with alternative operations of PLTU Pangkalan Susu Unit #3 and Unit #4. PLTU Pangkalan Susu Unit #3 and Unit #4 is one of the solutions to the problems that occur, but the condition of PLTU Pangkalan Susu Unit #3 and Unit #4 has not been equipped with jetty development and coal unloading system facilities. The results showed that PLTU Pangkalan Susu Unit #3 and #4 can be a very important electricity support in Sumatera Utara and can be the fastest solution to overcome the deficits that occur in Nanggroe Aceh Darussalam. With the operation of PLTU Pangkalan Susu Unit #3 and #4, BPP Regional Sumatera will decrease because PLTU Pangkalan Susu Unit #3 and #4 use coal fuel which is one of the cheaper forms of renewable energy. Solution for jetty development and coal unloading system facilities PLTU Pangkalan Susu Unit #3 and #4 that best fits the analysis of the high best and use method that has been done is to use alternative solution 1, namely jetty development and coal unloading system facilities by separate from PLTU Pangkalan Susu Unit #1 and #2, because according to the results of the analysis more "worth" physically, operationally, technically, financially and in compliance with regulations*

Keywords: *Highest and Best Use Method, Jetty Development, Coal Unloading System Facilities*

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I. Introduction

Electricity management in Indonesia is regulated in Law Number 30 of 2009 concerning Electricity. The law states that the supply of electricity is controlled by the state, which is carried out by the Government and the Regional Government based on the principle of regional autonomy. The law also mentions that the implementation of electricity supply business is carried out by state-owned enterprises and regionally-owned enterprises.

PT. Perusahaan Listrik Negara (Persero), which is commonly known by the name PLN, is a BUMN that is given the mandate by the Government as the operator of electricity supply in Indonesia. PLN has the duty and responsibility to provide the electricity supply needed by all industries, small, medium and large scale companies, and the general public. PLN has duties and responsibilities ranging from the study and construction of power plants, operation, and distribution through transmission from the plant to consumers. This is accompanied by internal challenges and external challenges.

Projected electricity demand in Sumatera Utara is estimated to have an average peak load growth of around 7.43% per year, estimated to be up to 2020 the average peak load of Sumatera Utara increases to 2,190 MW so it requires an additional supply of generating power around 144 MW (not including a reverse margin of at least 30% or what is commonly referred to as a reserve of power for peak loads), to handle this in the PLN's business plan for electricity supply (RUPTL) 2019 to 2028 which has been approved by the Decree of the Minister of Energy and Mineral Resources No. 39.K / 20 / MEM / 2019 dated February 20, 2019, one of PLN's targets in this case PT PLN (Persero) Unit Induk Pembangunan Pembangkit Sumatera (PLN UIPKITSUM), is

the completion of the construction of PLTU Pangkalan Susu Unit #3 and Unit #4 where in the same location at PLTU Pangkalan Susu Unit #3 and Unit #4, previously it has also been built alongside PLTU Pangkalan Susu Unit #1 dan Unit #2 which have been operating since 2015.

The construction of PLTU Pangkalan Susu Unit #3 and Unit #4 uses funding sourced from China loans using the G to G (Government to Government) program with government guarantees and using a preferential buyer's credit scheme, with the program and scheme PLN gets loans with interest on loans very low and long loan periods. This is very beneficial for PLN in terms of financial and investment plans, but in the process the value of the loan approved by the Ministry of Finance as one of PLN's shareholders and representing the Government, is only able to build its generating units, while the coal unloading system facilities are not intended for work funded by a loan with the G to G program between the Governments of Indonesia and China.

Strategic alternatives still need to be done deepening analysis to find out which alternative is the best. Various implications must be considered in the selection of alternatives to be chosen, namely from the legal aspects, technical aspects, financial aspects and productivity. The study of various aspects needs to be done to avoid problems in the future. Related to the alternative selection, one of the methods that can be used is the highest and best use method. Highest and best use analysis is a concept that is very well known in the field of optimization and valuation of assets (Suprapno, 2010) which is physically or technically possible, legally permitted and financially feasible, and produces the highest value to increase the profit of PT. PLN.

II. Literature Review

2.1 Highest And Best Use

According to Luce (2012), quoting from "the Society of Residential" is the highest and best concept of use applied to land or building objects that will maximize the owner's wealth through the most profitable use. The concept of HBU is also applied to an asset or property that was built with the remaining economic life (Utomo and Rasyid, 2013). Where the highest and best use of the use of the asset or property is the most profitable for the owner (Adji, 2015).

2.2 Pembangkit Listrik Tenaga Uap (PLTU)

Technology Application Assessment Agency said that a steam power plant is a type of plant that uses renewable energy by using fuel when testing or starting-up and coal when it is operational. PLTU has various main components including boilers, turbines, generators, transformers, substations and other supporting facilities which also have an important influence on the operation of the power plant, one of which is coal unloading facilities, transmission and so on. According to Dachyar (2012) the type of PLTU in Indonesia when distinguished from the combustion system can be divided into two types, PLTU, namely PLTU which uses a pulverized coal boiler and a circulating fludize bed boiler.

2.3 Financial Aspects

The financial aspects of project preparation and analysis explain the financial effect of a proposed project on the parties involved in it (Saphiro, 2005). The main purpose of financial analysis is to determine projections about the budget that will be used efficiently by estimating revenue and expenditure during project implementation and in the years to come each year (Gittinger, 1986).

III. Research Methods

3.1 Research Type

Sugiyono (2013) research method is basically a scientific way to get data with specific purposes and uses. The research method is a scientific way to obtain data with specific uses. Based on the explanation above, it can be concluded that the research method is a scientific way to obtain data with specific purposes and uses.
This type of research is Descriptive Research, namely by gathering actual information in detail that describes the symptoms that exist, identify problems, examine conditions and practices in the field, make comparisons / evaluations and determine what other people do when faced with the same problem and learn from their experience in setting plans and decisions in the future.

3.2 Research Location

Location This study took place in the village of Tanjung Pasir Sungai Dua Kedaung, Pangkalan Susu District, Langkat Regency, Sumatera Utara. This research was conducted in ± 6 (six) months.

3.3 Data Analysis Techniques

Analysis of the highest and best use consisting of physical aspects, legal, financial aspects (Widyastuti, 2006).

IV. Results

4.1 Availability of Transmission Lines

With the increase in peak load each year, especially on the island of Sumatra with a growth of around 7.43% per year (RUPTL 2019-2028), the PLN is required to be able to meet the power needs. The installed capacity in Sumatera Utara as of February 2019 is 3,400.2 MW with DMN 2,505.6 MW, based on the calculation of PLN it is estimated that it will experience a net power deficit in the electricity system in Sumatera Utara at the end of 2019 to reach 154.2 MW (by applying 30% reverse margin reserve criteria, and at the beginning of the year 2022 of 31.18 MW (without applying the 30% reverse margin reserve criteria) if the magnitude of peak load growth is not immediately anticipated by PLN, this could result in an electricity crisis in Sumatera Utara in early 2020 which will have an impact on rolling blackouts.

Figure 1 Transmission of Sumatera Utara

From Figure 1 the current PLTU Pangkalan Susu Unit #1 and Unit #2 enter Sumatera Grid via an existing 275 kV transmission to Binjai GI and then channeled to Sumatera Utara via GI Galang. The development of PLTU Pangkalan Susu Unit #3 and Unit #4 in addition to increasing supply to Sumatera Utara is also in line with the construction of 275 kV transmission towards Arun Lhoksumawe, Nanggroe Aceh Darussalam, later with the operation of this PLTU and 275 kV transmission towards Arun Lhoksumawe supplying power to Aceh which is currently experiencing a deficit of 153 MW in May 2019 as shown in Figure 2.

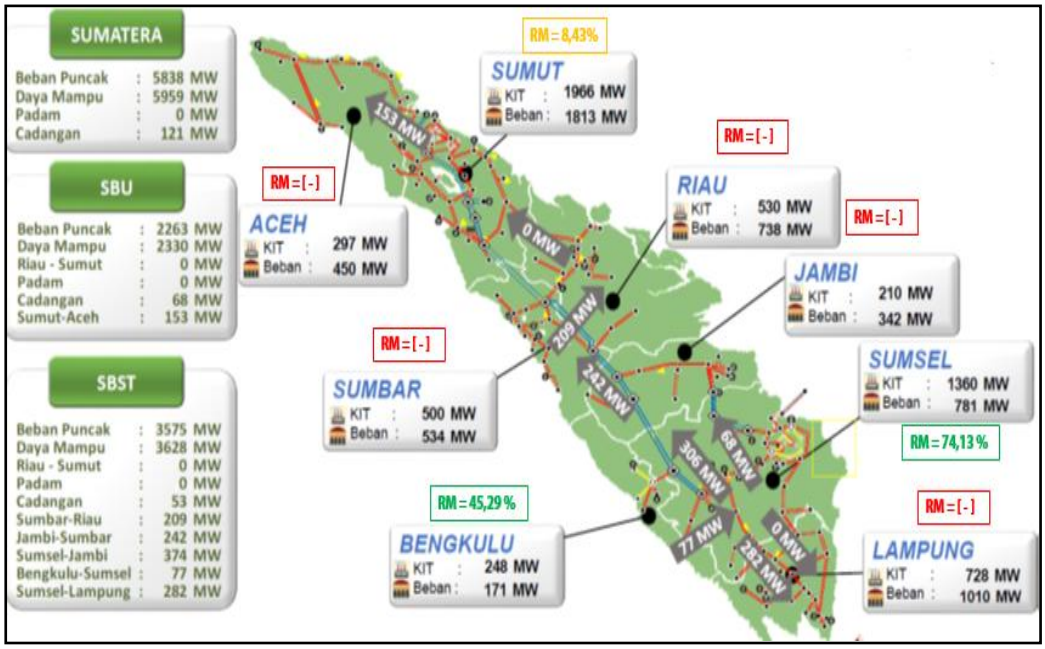

Figure 2 The Highest Load Flow of the Sumatera System 02 May 2019 at 19.00 WIB

4.2 Alternative Financial Aspects 1, 2 and 3

Procurement and jetty development and coal unloading system facilities PLTU Pangkalan Susu Unit #3 and Unit #4 will certainly increase the reliability of PLTU Pangkalan Susu Unit #3 and Unit #4, what is meant by alternative 1 is jetty development and coal unloading system PLTU Pangkalan Susu Unit #3 and Unit #4 are designed and built separately from Unit #1 and Unit #2.

Alternative 1 assumption 1 is the calculation of interest expense on loans for the construction of PLTU Pangkalan Susu Unit #3 and Unit #4 for the operation of the plant by building a jetty development and coal unloading, while alternative 1 assumption 2 is the calculation of primary energy consumption (substitute fuel and PLTU) if the jetty development and coal unloading PLTU Pangkalan Susu Unit #3 and Unit #4 are not operating in a fixed time so that the fuel plant operates.

4.3 Highest and Best Use Method

Jetty development and coal unloading system facilities PLTU Pangkalan Susu Unit #3 and #4 that best fits the analysis of the high best and use method that has been done is to use alternative solution 1, namely jetty development and coal unloading system facilities by separate from PLTU Pangkalan Susu Unit #1 and #2, because according to the results of the analysis more "worth" physically, operationally, technically, financially and in compliance with regulations.

V. Conclusion and Suggestion

5.1 Conclusion

From the results of the study it can be concluded as follows:

1.PLTU Pangkalan Susu Unit #3 and #4 can be a very important electricity support in Sumatera Utara and can be the fastest solution to overcome the deficits that occur in Nanggroe Aceh Darussalam.

2.With the operation of PLTU Pangkalan Susu Unit #3 and #4, BPP Regional Sumatera will decrease because PLTU Pangkalan Susu Unit #3 and #4 use coal fuel which is one of the cheaper forms of renewable energy.

3.Solution for jetty development and coal unloading system facilities PLTU Pangkalan Susu Unit #3 and #4 that best fits the analysis of the high best and use method that has been done is to use alternative solution 1, namely jetty development and coal unloading system facilities by separate from PLTU Pangkalan Susu Unit #1 and #2, because according to the results of the analysis more "worth" physically, operationally, technically, financially and in compliance with regulations.

5.2 Suggestion

To maintain, increase the availability and reliability of coal yard coal supply between PLTU Pangkalan Susu Unit #1 and Unit #2 and PLTU Pangkalan Susu Unit #3 and Unit #4 an in-depth and more comprehensive study of the possibility of interfacing coal handling PLTU Pangkalan Susu Unit #1 #2 and Unit #3 #4.

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