

Executive Summary

INVESTMENT OPPORTUNITIES IN PEMATANGSIANTAR CITY: CONSTRUCTING HYDROELECTRIC POWER PLANT IN PEMATANGSIANTAR CITY TO SUPPORT THE ECONOMY MOVEMENT

Introduction to Pematangsiantar City

Pematangsiantar City is located in the North Sumatera with a distance of 128 Km from Provincial Capital, namely Medan. The total area is 79,971 Km² or 0,11% from North Sumatera Province. Pematangsiantar City topography is mostly flat and hilly ramps. Pematangsiantar City has height of 400 – 500 m above sea level. The city temperature has temperature zone with an average maximum temperature of 30°C and average minimum temperature of 21°C with average humidity of 84%.

The population of female in Pematangsiantar City is more than the population of male. In 2011 Pematangsiantar City population reached 250.997 inhabitants with population density of 3.146 inhabitants per-Km² and population growth rate of 0,40%. Labor growth in Pematangsiantar City was in line with population growth. Nevertheless, the growth is not comparable to the growth of job creation and allow high rate of unemployment.

The city has long road of 412,942 Km, and has good road condition of 241,751 Km. The availability of water supply in the city is divided into two systems i.e. system of piping network managed by local water company/*Perusahaan Daerah Air Minum* (PDAM) and non-system piping (well, etc.) which are managed independently by the population. While the availability of electricity is arguably less would be sure. The frequent blackout, happen at least once a day, is part of electricity crisis that has been happened years in North Sumatera Province.

Generally GDP of Pematangsiantar City in period 2007 – 2012 increased, both on the basis of prevailing prices or on the basis of constant prices. GDP basis on prevailing price made in 2012 around Rp. 4.918.660,82 million rupiah, with growth rate of 7,73%. The economic sectors that dominate the creation of Pematangsiantar City GDP in 2012 were trade, hotels and restaurant sector, manufacturing Industry sector, financial, dwelling and business service sector. The role of those three sectors in the creation of Pematangsiantar City GDP was 70,12%.

It actually has great economy potential seen from its strategic location. But the electricity crisis that hit the city for years makes the economy growth run slowly. It is therefore one of interesting investment opportunities in the field of power plant. The construction of the power plant is planned by utilizing the potential of Bah Bolon River.

The Calculation of Investment for 1 unit of River Power Plant of Bah Bolon worth Rp. 27.553.377.878 with total profit of Rp. 28.255.081.726. Payback period obtainable in less 5 years provided that plant systems can take place with good conditions. Calculation of depreciation with straight line method, Hydroelectric Power Plant of unit one at the end of their economical lifespan benefits or end of 20th year that has a value of Rp. 6.392.654.754 with depreciation value over the last 20 years of Rp. 13.424.672.451. From conclusions above then Hydroelectric Power Plant Bah Bolon River is **still feasible** to be implemented.

A. GENERAL DESCRIPTION

A.1. Geographical and Administrative Aspects

Pematangsiantar City is located in the North Sumatera with a distance of 128 Km from Provincial Capital, namely Medan. Geographically, Pematangsiantar City is located in the line $2^{\circ} 53' 20'' - 3^{\circ} 01' 00''$ North latitude and $99^{\circ} 1' 00'' - 99^{\circ} 6' 35''$ East Longitude.

Pematangsiantar City has extensive of 79,971 Km² or 0,11% from North Sumatera Province, consists of 8 sub-districts and 53 political districts/*Kelurahan*. The boundary of Pematangsiantar City's territory to the East, West, North and South is Simalungun Regency. In administration Pematangsiantar City territory is divided into 8 (eight) sub-districts as follows:

1. Siantar Marihat Sub-district
2. Siantar Marimbun Sub-district
3. South Siantar Sub-district
4. West Siantar Sub-district
5. North Siantar Sub-district
6. East Siantar Sub-district
7. Siantar Martoba Sub-district
8. Siantar Sitalasari Sub-district

A.2. Physical Condition

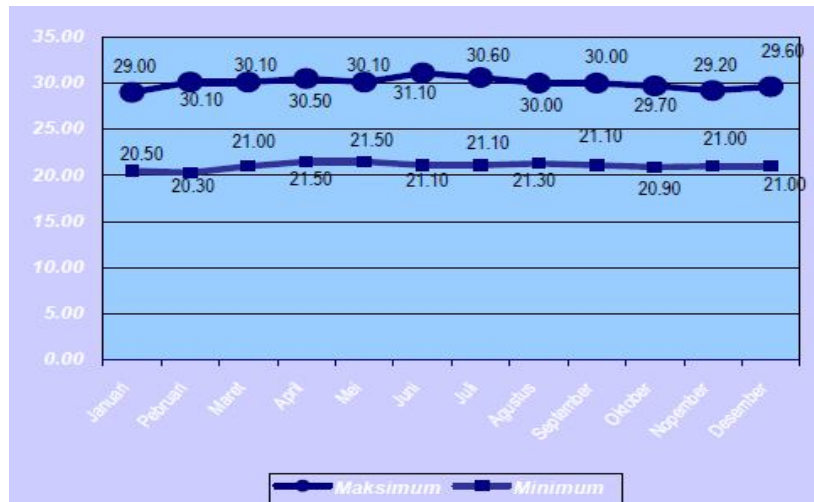
A.2.1. Morphology, Climate, and Rainfall

Pematangsiantar City has total area of 79,971 Km² or 0,11% from North Sumatera Province. Pematangsiantar City topography is mostly flat and hilly ramps. It has height of 400 – 500 m above sea level. The bumpy and hilly areas to the North and West while the South and East are the area of ramps with a slope of 0%-15%.

A.2.2. Climate and Rainfall

As it lies near the equator, Pematangsiantar City belongs into the tropical area and flat area. It has temperature zone with an average maximum temperature of 30°C and average minimum temperature of 21°C with average humidity of 84%. The highest average in January and March reaches 87%, while the average rainfall 257 mm where the highest rainfall occurred in September, which reaches 465 mm.

FigureA-1Maximum and Minimum Air Temperature in PematangSiantar City



TableA-1The Average of Air Humidity, Rainfall, Sun Shine, Wind Speed and Evaporation

Month	Air Humidity	Rainfall	Sun Shine	Wind Speed	Evaporation
January	87	410	4,3	0,02	3,16
February	81	55	5,4	0,06	3,73
March	87	384	5,2	0,03	3,21
April	85	309	5,1	0,04	3,01
May	85	353	5,6	0,07	2,49
June	79	41	5,9	0,04	3,66
July	80	126	5,7	0,08	3,07
August	83	148	4,8	0,05	3,20
September	85	465	4,5	0,04	3,05
October	85	342	4,1	0,02	3,16
November	86	254	3,9	0,06	2,98
December	85	202	5,0	0,03	3,47
Average	84	257	5,0	0,05	3,18

Source : Meteorological station PPKS Marihat Association, 2011

A.3.Population and Labor force

A.3.1. Rate and Number of Population Growth

in 2011 the population of Pematangsiantar City reached 250.997 inhabitants with population density of 3.146 inhabitants per-Km². Whereas population rate of Pematangsiantar City in 2011 was 0,40%. The population of female in Pematangsiantar City is more than the population of male.In 2011 the female population in Pematangsiantar City reached 127.516 and for the male reached 123.481 inhabitants. Thus the sex ratio of Pematangsiantar City is 96,84.

TableA-2 Total Area, Number of Political District and City Population of Pematangsiantar According to Sub-district in 2011

Sub-district	Total Area	The Number of Political District	Total Population	Population Density
SiantarMarihat	7,825	7	19.697	2.517
SiantarMarimbun	18,006	6	13.393	744
South Siantar	2,020	6	21.920	10.851
West Siantar	3,205	8	48.811	15.230
North Siantar	3,650	7	51.632	14.146
East Siantar	4,520	7	44.093	9.755
SiantarMartoba	18,022	7	28.250	1.568
SiantarMartoba	18,022	7	28.250	1.568
Pematangsiantar	79,791	53	250.997	3.146

Source: BPS of Pematangsiantar City, in 2012

A.3.2. Labor Force Participation Rate

Labor growth in Pematangsiantar City was in line with population growth. Nevertheless, the growth is not comparable to the growth of job creation and allow high rate of unemployment. In 2011, the number of job seekers who registered by Department of labor of Pematangsiantar City around 1.422 people, where the largest job seekers from S-1 level of education was 489 or about 34% from the total of job seekers.

TableA-3 Number of Job Seeker According to Educational Level in 2011

Educational Level	Registered		Total	Placed		Total
	Male	Female		Male	Female	
Not Study	-	-	-	-	-	-
Elementary School	-	-	-	-	-	-
Junior High School	3	3	5	-	-	-
Senior High School	107	197	304	-	13	13
Vocational High School	70	154	224	-	34	34
Secondary Technical School	-	-	-	-	-	-
SPK	2	-	2	-	-	-
Others	-	1	1	-	-	-
D I	16	15	31	-	-	-
D II	4	6	10	-	-	-
D III	84	270	254	-	-	-
S1	201	288	489	-	-	-
S2	1	1	2	-	-	-
Pematangsiantar	488	934	1.422	-	47	47

Source: Labor Department of Pematangsiantar City in 2011

A.4. Condition of Facilities and Infrastructure

A.4.1. Land Transportation

To meet a good regional economic level, not apart from one of the facilities provided by the local government, i.e. the provision of good road facilities as well. The facility in Pematangsiantar City in 2011 very influencein supporting of accessibility required by the community.

TableA-4Road Condition of Pematangsiantar Cityin 2012

Description	2012
Length of Road	412,942 Km
a. Paved	353,702 Km
b. Gravel	4,837 Km
c. Ground	3,555 Km
d. No Details	51,048 Km
e. Good Condition	241,751 Km
f. Medium Condition	62,928 Km
g. Poor Condition	108,273 Km
h. Class II (State Road)	17,491 Km
i. Class IIIb (Provincial Road inTown)	5,523 Km
j. ClassIIIc (Town Road)	363,445 Km
k. No Details	11,673 Km
The Length of Drainage	581.512 Km
The Width of Sidewalk	71.856 M2
The Length of Bridge	342,65 M
The Outer Road (NationalandProvince)	23,014 Km
The Length of Irrigation	689.2 M

Source : Dept. of Bina Marga and Irrigation of Pematangsiantar City, 2012

A.4.2. The Availability of Water Supply

Provision and management of water supply in is divided into two systems i.e. system of piping network managed by local water company/*Perusahaan Daerah Air Minum* (PDAM) and non-system piping (well, etc.) which are managed independently by the population. For servicing of piping systems include almost all sub-districts in Pematangsiantar City. Piping network system in Pematangsiantar City services and operations performed by Local Water Company with the scope of services all sub-districts in Pematangsiantar City.

A.4.3. Source of Electrical Energy

The development of telecommunication networks in recent years was quite exhilarating, seen with the number of units the connection that was marketed to the public. If seen from

the distribution of each exist sub-district, then the telephone network has to reach all the villages in each sub-district. Availability of electrical power it is possible for the development of investments.

A.4.4. The availability of Trade and Service Facilities

Availability of hotel facilities and restaurant is the achievement of performance competitiveness for trade and service. The growth of new hotels and restaurants that occurred during this time is one that the indication that the economic potential of the community still will continue to increase with increasing levels of social welfare.

In addition, the existence of Horas Market and Dwikora Market become very vital factor in the growth of trade in Pematangsiantar City.

A.5. Regional Development Policies

A.5.1. Medium-Term Regional Development Plan

As a trading city, geographically Pematangsiantar is flanked by Simalungun Regency that has a wealth of rubber plantation, palm oil, tea and agriculture. Later the city also connects the road to other regencies, such as Toba Samosir, North Tapanuli and South Tapanuli. It makes the position is very strategic as the transit city of trade between regencies or transit tour to The Lake of Toba Parapat.

Pematangsiantar City has vision in the development of The City, as follows:

”The realization of Pematangsiantar City that has identity of a city in an autonomous area advanced, democratic, cultural pillars and harmony supported by the community of Pematangsiantar City who faith, good attitude, tough, productive, competitive and able to work together in organizations of The Unitary State of The Republic of Indonesia.”

To realize the above vision, the mission in Spatial Plan of Pematangsiantar City i.e. with forming characterized based on considerations of historical and geographical and physical culture city, potential resources and research functioning and study of *planologi* of the city, architecture and so on.

The development of the local economic focus on:

1. Utilization of local potential.
2. Involve all stakeholders substantially in a strategic partnership.
3. Enhanced resilience and economic independence
4. Continued of development.

5. Utilization of development results by most of local people
6. The development of small and medium enterprises.
7. Economic growth which is reached inclusively.
8. Strengthening capacity and improving the quality of human resource.
9. Subtraction gap among the societies, sectors, and regions
10. The reduction of the negative effects of economic activity on the environment.

A.5.2. Spatial Plan Area

In order to realize the integration of development between sectors, regions, and communities, then the Spatial Plan of the region is the location of landing investment development implemented by the Government, society, and the business world. Spatial Plan Area Pematangsiantar City which subsequently abbreviated RTRW (*Rencana Tata Ruang Wilayah*) of Pematangsiantar City is the result of Spatial Plan Area of City containing directives policy and strategy use of regency area space.

The purpose and objectives of development in Pematangsiantar City in Spatial Plan Area of Pematangsiantar City is to regard vision and mission the area of Pematangsiantar City:

Realization of Stable, Advanced and Victorious Area of Pematangsiantar City

STABLE

It means that all potential areas neither natural resources nor human resources in a stable state and able to contribute in regional development.

ADVANCED

In terms of the performance of regional development is characterized by the presence of the pace of growth and improvement of graphic in the priority sectors which directly has positive impact to improve quality of life and strengthening the position of the competitiveness of the economic, social and cultural society of Pematangsiantar on sustainable basis

VICTORIOUS

In terms of regional development results that have been implemented by the City Government and Pematangsiantar society work successfully according to the targets and set in the performance of development.

As for the priority developments of Pematangsiantar City in 2014 are:

1. Improving the quality of management of good governance through improved quality and infrastructure system, improve the quality of human resources as well as break through the implementation of National Election either Representative/DPR, Local Council/DPD, Legislators/DPRD as well as vice president and president.
2. Improving accessibility of education quality through intensifying the quality and quantity of educators, facilities and infrastructures.
3. Increasing services and health rate through improved quality and quantity of health care as well as the facility and infrastructure of health services.
4. Enhancing poverty reduction through an expansion of employment and empowerment of the poor people.
5. Keeping food availability through intensification and optimization of food sources, maintain the stability of the distribution of foodstuffs and encourage an increase in food processing technology.
6. Improving the capacity and infrastructure to support the accessibility of economic development through increased quality and quantity of roads and bridges, irrigation, housing and settlement.
7. Synchronizing of spatial plan area through structuring space pattern, the structure of space and development of urban area that are clean, green, character, beautiful and aesthetic.
8. Encouraging the movement of the real sector through empowerment of people's economy, economy of Small Medium Enterprises and cooperative and increased investment.
9. Improve the economic cooperation and development either among local government, central government nor private parties through the creation of a memorandum of agreement.
10. Developing the potential of tourism through promotion and exploration potential of tourism, stimulating the growth of tourism investment, building tourist attractions and improve the quantity and quality of facilities and infrastructure of supporting tourism.

B. THE PROFILE OF ECONOMIC REGION

B.1. Economic Structure

In general GDP of Pematangsiantar City in the period of 2007 – 2012 had increased both on the basis of prevailing prices or the basis of constant prices. GDP on the basis of prevailing prices was formed in 2012 was Rp. 4.918.660,82 million rupiah, with the growth rate of 7,73% compared in 2011 was Rp. 4.565.661,84 million rupiah. While the GDP at constant prices in 2012 was Rp. 2.282.776,54 million rupiah, with growth rate around 5,64% compared in 2011 was Rp. 2.160.830,02 million rupiah.

The economy sectors that dominated the formation of Pematangsiantar City GDP in 2012 were trade, hotel and restaurant, manufacturing industry, financial, dwelling, and business service. The role of these three sectors in formation of Pematangsiantar City GDP was 70,12%

TableB-1 GDP of Pematangsiantar City in 2012

Description	2012
GDP of ADHB (in million)	4.918.650,82
GDP per capita	20.763.180
The Growth of GDP per capita (%)	7,73
GDP of ADHK (in million)	2.282.776,54
PDRB per capita	9.636.319
The Growth of GDP per capita (%)	5,64
Inflation	4,73

Source: BPS of Pematangsiantar City

B.2. Economy Growth of Pematangsiantar City

Economic growth is one of ways to see the development results which implemented. Such growth is the summary of growth rate which shows the changing of economy rate happened. This indicator is really needed in order to know development success has achieved and determine the direction of development in the future.

Economic growth in real terms can be seen from GDP figure basis on constant price. Positive growth indicates an increase of the economy, whereas negative growth; indicates economy decrease due to the sluggishness of economy.

TableB-2 Gross Domestic Product According to Business Field (Million Rupiah) in 2012

No	Business Field	ADHB	ADHK
1	Agriculture	121.033,32	66.918,28
2	Mining & Quarrying	929,08	407,47
3	Manufacturing Industry	973.271,76	255.411,06
4	Electricity, Gas, Water Supply	62.602,31	24.616,43
5	Construction	233.087,27	179.923,71
6	Trade, Hotel and Restaurant	1.799.781,34	776.678,47
7	Transportation and Communication	423.551,38	370.371,60
8	Financial, Dwelling and Business Service	676.601,06	306.207,85
9	Services	627.793,31	302.241,67
	GDP	4.918.650,82	2.282.776,54

Source: BPS of Pematangsiantar City

B.3. the Growth of Business Field

The growth rate of GDP of ADHK in Pematangsiantar City in 2012 was 5,64% slowed down by 0,34% compared in 2011 around 5,98%. It can be seen on GDP of Pematangsiantar City 2007 – 2012 on the table below.

**TableB-3 The Growth rate of Pematangsiantar City GDP of ADHK
According to Business Field (percentage) in 2007 – 2012**

No	Business Field	2007	2008	2009	2010	2011	2012
1	Agriculture	-8.42	-0.60	-0.27	0.57	0,85	1.61
2	Mining & Quarrying	0.31	-5.76	-0.27	-0.25	-0.06	-0.59
3	Manufacturing Industry	6.74	0.63	1.61	1.64	1.58	1.61
4	Electricity, Gas and Water Supply	-2.99	1.90	2.67	2.68	3.08	2.62
5	Construction	0.63	0.36	3.31	3.56	4.70	3.31
6	Trade, Hotel and Restaurant	4.30	8.33	8.90	9.16	9.00	8.07
7	Transportation and Communication	5.74	4.78	4.54	4.45	4.54	3.17
8	Finance, Dwelling and Business Service	12.24	6.77	7.12	8.18	7.73	5.71
9	Service	6.69	11.51	3.47	4.61	4.99	8.82
	GDP	5.12	5.72	5.36	5.85	5.98	5.64

Source: BPS of Pematangsiantar City

In 2012, There are 3 (three) business fields that grew above 4% each, namely: trade, hotel, and restaurant of 8,07 %, the sectors of financial, dwelling and business industry of 5,71 %, the sector of service of 8,82 %.

B.4. The Potential of Economy

B.4.1. Agriculture

The development of Harvested Area of paddy of wetland in Pematangsiantar City in 2011 decreased of 13,02 % from 4.308 ha in 2008, became 3.747 ha in 2011.

Table B-4 Harvested Area and The Production of Paddy Rice Plant According to Sub-district in 2011

Sub-district	Harvested Area	Production	Production Average
SiantarMarihat	1.808	9.709	5,4
SiantarMarimbun	1.147	6.157	5,4
South Siantar	-	-	-
West Siantar	-	-	-
North Siantar	-	-	-
East Siantar	-	-	-
SiantarMartoba	440	2.362	5,4
SiantarSitalasari	352	1.891	5,4
Total	3.737	20.119	5,4

Source: Dept. of Agriculture of Pematangsiantar City

B.4.2. Livestock

The number of beef cattle in Pematangsiantar City in 2011 reached 269 heads and buffalo reached 166 head. For poultry, free-range chicken population reached 117.853 heads, broiler was 17.360 heads and duck was 8.757 heads.

Table B-5 Population of Large Livestock According to Sub-district in 2011

Sub-district	Dairy Cows	Cow	Buffalo	Horse
SiantarMarihat	-	26	44	-
SiantarMarimbun	-	10	23	-
South Siantar	-	3	12	-
West Siantar	-	-	-	-
North Siantar	-	-	-	3
East Siantar	-	-	-	-
SiantarMartoba	-	159	49	-
SiantarSitalasari	-	71	38	-
Total	-	269	166	3

Source: Dept. of Agriculture in Pematangsiantar City

B.4.3. Industry and Trade

The number of small industry in Pematangsiantar City in 2011 there were 501 Industries. When compared to previous year in 2010 increased of 2,66 %. Most numerous Small Industries in Pematangsiantar City belong to food industry; drink and tobacco Industry were 166 industries. Followed by the metal good industry, machinery and equipment Industry were 141 industries. While most labor absorption in the groups of; food industry, beverage and tobacco were 1.615 industries and followed by metal goods, machinery equipment, which absorb the labor force around 808 people.

And for the number of medium-large industrial companies were 38 companies, 24 companies were food industries, beverage and tobacco industries. The labor force could be absorbed for medium-large industrial companies in 2011 were 4.273 people. The group of; food industries, beverage and tobacco industries were the most widely pervade labor force with 3.772 people.

C. INVESTMENT OPPORTUNITIES

C.1. Superior Sector

GDP growth of a region is created from the growth of existing business fields in the area. The growth of Pematangsiantar City GDP in 2012 of 5,64% it came from services of 8,82%, trade, hotel and restaurant of 8,07%, followed by the sectors of financial, dwelling and business service of 5,71%, construction sector was 3,31%, transportation and communication of 3,17%, the sector of electricity, gas and water supply of 2,62%, the sectors of plantation and manufacturing company of 1,61%, as well as mining and quarrying gave the smallest contribution close to 0%.

Table C-1 Growth Rate of Pematangsiantar City GDP of ADHB According to Sector (%) In 2012

No	Business Field	2012
1	Agriculture	4.79
2	Mining & Quarrying	1.83
3	Manufacturing Business	1.67
4	Electricity, Gas and Water Supply	2.71
5	Construction	4.13
6	Trade, Hotel and Restaurant	11.23
7	Transportation and Communication	4.39
8	Finance, Dwelling and Business Service	6.68
9	Services	14.32
	GDP	7.73

Source: BPS of Pematangsiantar City

GDP per capita of Pematangsiantar City basis on prevailing price in 2012 around Rp. 20.763.180,- and the growth reached 7,73%. If compared with the growth of GDP per capita previous year. The GDP per capita growth in 2012 was slow down, from 9,66% in 2011 became 7,73% in 2012. This reflects that the GDP created in 2012 distributed was smaller than the previous year as a result of greater growth with the GDP growth on the basis of the prices prevailing in that year.

Thus with the growth of GDP per capita on the basis of constant prices also experienced slow growth of 5,64% compared with the previous year. Development of GDP per capita in 2007 – 2012 can be seen on table below

Table C-2 GDP of Pematangsiantar City in 2007 – 2012

Description	2007	2008	2009	2010	2011	2012
GDP of ADHB (in million)	3,094,556.17	3,464,686.68	3,746,215.84	4,163,437.74	4,537,599.60	4.918.650,82
GDP per capita	13,315,073	14,854,917	16,008,238	17,739,554	19,154,637	20.763,180
The Growth of GDP per capita	12.12	11.56	7.76	10.82	7.98	7.73
PDRB of ADHK (in million)	1,729,273.43	1,828,251.13	1,926,298.65	2,038,924.45	2,161,591.05	2.282.776,54
GDP per capita	7,440,615	7,838,665	8,231,412	8,687,439	9,121,540	9.636.319
The Growth of GDP per capita	4.72	5.35	5.01	5.54	5.03	5,64

Source: BPS of Pematangsiantar City

In 2013 it's estimated that the economy condition of Pematangsiantar City will increase, in 2012 and inflation rate may be suppressed under 4,73%

C.2. Investment Opportunities

The attraction of investors to invest heavily influenced factors such as interest rates , tax policy and banking regulations , safety conditions , and availability of infrastructure supporting economic activity .

The city actually has a great economic potential view of the strategic location. Regarding infrastructure , the city has a path along the 412.942 km to 241.751 km in good condition . The availability of clean water in the city is also well fulfilled which was divided into two (2) system , the piping network systems managed by water companies and non -piped systems. While the availability of electricity in the city is arguably less fulfilled . Frequent power outages , at least once a day , is part of the power crisis that has for years plagued province of North Sumatra .

From the above it is one of the attractive investment opportunities for the city is investing in the power sector. The place to be used as a planning hydroelectric plant is located on the River Bah Bolon. As expected from the Local Government Pematangsiantar, so that the hydropower plan to attract investors to invest in development.

C.3. Investment Feasibility

In the development of electric power center, it needs expanding or extending plant capacity has existed, replacing new power plant units in new place as well. The power plant that has been operating with an economical and experiencing depreciation on equipment of mechanics electro that always be imputed depreciation value every year.

In conducting the assumption of investment feasibility calculation in planning the construction of a Hydroelectric Power Plant on Bah Bolon River, which will be planned with production capacity of 2 x 9 MW and utilize the water from Bah Bolon River, can be seen the assumption of investment feasibility calculation of Hydroelectric Power Plant on Bah Bolon River below.

Investment Cost

The Investment cost in general for construction of Hydroelectric Power Plant in Bah Bolon River is divided into two units, which are:

Unit 1 :	- Equipment of Mechanics Electro	Rp. 19.817.327.205,-
	- Kill Common	Rp. 7.736.050.673,-
	- Total	Rp. 27.553.377.878,-
Unit 2 :	- Equipment of Mechanics Electro	Rp. 19.370.299.000,-
	- Kill Common	Rp. 7.561.545.160,-
	- Total	Rp. 26.931.844.160,-
	Total Investment Cost (Unit 1+Unit 2) :	Rp 54.485.222.038,-

Operational Cost

Operational Cost is the most important cost in supporting the performance of Hydroelectric Power Plant in Bah Bolon River, which consists of several kinds of costs include to scope of Operational Cost, as follows:

Maintenance Costs Unit 1

Material	Rp. 220.594.771,-
Whole sale Services	Rp. 267.284.989,-

Total Maintenance Costs Unit 1 **Rp. 487.879.760,-**

Maintenance Costs Unit 2

Material Rp. 68.832.836,-

Wholesale Services Rp. 221.081.689,-

Total Maintenance Costs Unit 2 **Rp. 289.914.525,-**

Administrative Cost

Administrative Cost consists of job duty of employee, payment of electricity, gas, water, post and telecommunication, foodstuffs and consumption, office instruments, tax and security.

Unit 1 Rp. 130.390.498,-

Unit 2 Rp. 50.813.790,-

Total Administrative Cost **Rp. 181.204.288,-**

Employment Cost

Employment Cost is the costs incurred for the employee who work in Hydroelectric Power Plant.

Unit 1 Rp. 769.079.623,-

Unit 2 Rp. 768.356.501,-

Total Employment Cost **Rp. 1.537.436.124,-**

Depreciation

Unit 1 Rp. 990.866.360,-

Unit 2 Rp. 968.514.950,-

Total Depreciation Cost **Rp. 1.959.381.310,-**

Water Cost

Water cost is costs associated with water tax and water levy costs used for Hydroelectric Power Plant.

Unit 1 Rp. 204.738.656,-

Unit 2 Rp. 241.201.351,-

Total Water Cost **Rp. 445.940.008,-**

Lubricant Cost

The cost of expenditure for a lubricant this period unit 1 is Rp.17.160.000,-and for unit 2 still has lubricant supplies so it doesnot put out the cost of lubricants during this period. From some descriptions of the operating costs then it is recorded and can be known the operation of Hydroelectric Power Plant Cost for a period of one year.

Details:

Operational Cost of Unit 1

Total Maintenance Costs	Rp. 487.879.760,-
Total Administrative Cost	Rp. 130.390.498,-
Total Employment Cost	Rp. 769.079.623,-
Total Depreciation Cost	Rp. 990.866.360,-
Total Water Cost	Rp. 204.738.656,-
Lubricant Cost	Rp.17.160.000,-
Total Operational Cost Unit 1	Rp. 2.600.114.897,-

Operational Cost Unit 2

Total Maintenance Costs	Rp. 289.914.525,-
Total Administrative Cost	Rp. 50.813.790,-
Total Employment Cost	Rp. 768.356.501,-
Total Depreciation Cost	Rp. 968.514.950,-
Total Water Cost	Rp. 241.201.351,-
Lubricant Cost	Rp. -
Total Operational Cost Unit 2	Rp. 2.318.801.117,-

Conclusion

Pay Back Period of Hydroelectric Power Plant//PLTA unit 1 until the end of 5th year, as follows:

Investment Value : Rp. 27.553.377.878,-

Total profit : Rp. 28.255.081.726,-

Thus value obtained for the payback period investment cost of Hydroelectric Power Plant unit 1 within a period less than 5 years on the condition that if the power system can take place with good condition.

Payback period of Hydroelectric Power Plant unit 2 until the end of the 6th year, as follows:

Investment Value : Rp. 26.931.844.160,-

Total profit : Rp. 28.572.007.095,-

Thus value obtained for the payback period investment cost of Hydroelectric Power Plant unit 2 within a period less than 6 years on the condition that if the power system can take place with good condition.

Payback period on Hydroelectric Power Plant unit 1 achieved faster than Hydroelectric Power Plant unit 2, due to the use of the engine unit 1 preferred its performance so that the hours of operation and the results of the electrical machine production unit 1 is greater than the machine unit 2 that affect the profit of the plant itself.

ROI (Return On Investment) on Hydroelectric Power Plant unit 1 reached 25,04% at the end of 1st year and ROI (Return On Investment) on Hydroelectric Power Plant unit 2 reached 22,64% at the end of 1st year. ROI is obtained based on the payback period of each unit Hydroelectric Power Plant.

Calculation of depreciation with method of straight line, Hydroelectric Power Plant unit 1 at the end of age or end economic age in the 20th year that has value of Rp. 6.392.654.754,- with the total depreciation value over 20 years amounting to Rp. 13.424.672.451,-.

For Hydroelectric Power Plant unit 2 at the of age or end economic age in the 20th year that has value of Rp. 6.248.452.817,- the total depreciation value over 20 years amounting to Rp. 13.121.846.183,-

Hydroelectric Power Plant unit 1 and unit 2 are **still feasible** to operate according to the result of analysis study of economic feasibility.