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Analysis of Economical Project Development of Land Fuel Storage in Oil and Gas Upstream Industry Case study Gasoline Filling Depot in Jambi Province

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Abstract
Activities of oil and gas production are a complex series of processes involving various activities of oil and gas industry from upstream to downstream. Upstream business in oil and gas activities include the activities exploration, exploitation through drilling activities and completion of wells, mean of transportation, storage and processing of separating and refining of oil and gas in the oil field. Downstream activities includes processing through the activities of oil refineries to produce fuels and their derivatives and marketing and distribution through the activities of storage. The high mass needs gasoline and kerosene (BBM) is a result of economic growth and domestic income and the growing automotive industry. This can be seen from the consumption of fuel in recent years. In the year 1999 and the consumption was 23.9 million kl, but a year later increased 26.2million kl. For 2004, the transportation sector's fuel consumption has reached 30.7 million kiloliters, and is predicted to continue rising within by incoming years, and in the next 10 years, transportation energy consumption is expected to increase two-fold. Growth in the period2000-2010 increased by an average of 7.3% per year. Accelerating the development of the fuel distribution infrastructure would be more effective for PT.Pertamina (Persero) with the distribution entrance into the business portfolio by inviting participation of private or third party investors through mutual cooperation. Provision of this infrastructure can be pursued by building of oil and gas processing facilities or refineries (oil & gas processing plant), oil and gas storage facilities (oil & gas storage / depots), oil and gas transportation facilities (oil & gas transporter delivery) and commercial facilities general / limited oil and gas (oil & gas trading).

Keywords : Downstream oil and gas business, Distribution infrastructure, Energy security, Fuel Oil Storage

1. Introduction

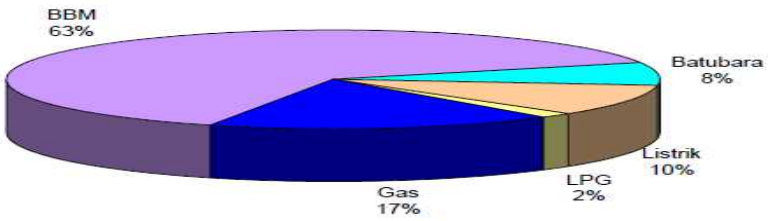
Oil and gas are unrenewable resources that have economic and strategic value. Until now, oil and gas as energy resources and as the first choice energy for industry, transportation and household, Production activities of oil and gas is a complex series, that involve various oil and gas industry form upstreamtodownstream. Upstream activities are exploration,*exploitation*by *drilling* and*well completion*, *transportation*, *storage* and*crude oilprocessing*for oil and gas separation and purification in field. D*ownstream activity include processing through refinery*to produce fuel and their derivatives and*marketing*and then distribution by s*torage*.

Since the enactment of law (UU) No. 22/2001 about oil and gas, business downstream oil and gas is supposed to have much changes. And started from January 1st 2006, down stream business oil and gas that was monopolized by Pertamina, is opened for everyone, include for foreign player. Downstream oil and gas is included by processing, transportation, and storage of oil and gas, up to retail level.It is similar with government regulation about energy security that become an important foundation for stamina of the economy. Together with stamina of the culture, stamina of the social, and stamina of the politics, stamina of the economy become a prominent element of National Stamina. So that, Presidential meeting on April 7th 2008, that was lead by President Susilo Bambang Yudhoyono,discussed specifically aboutEnergy Security System. Energy Security System is very important for a country, like Indonesia. Besides having a role as ability to respond global energy changing dynamics (external),it is also have a role as autonomy to guarantee energy availability (internal). Energy Security System refers to Energy Development Regulation, appropriated from **Undang-Undang Republik Indonesia Nomor 30 Tahun 2007 concerning The Energy**. Energy has an important role for the increase of Economy and National Stamina. The Energy Security is usually characterized by ability to respond the global energy dynamics and autonomy to guarantee the energy availability in the country. In this case, structuring regulation and institutional is an important thing.

That energy security system must be appropriated by regulation that carriessociety prosperity and supported by solid institutional design. Next, it is decided as priority regulation.

Condition of Indonesia's energy in a decade of stagnation use and management are not optimal although the potential energy resources in Indonesia are still quite large. Along with economic and industrial growth in Indonesia, the demand for energy is also growing and one of them the role of fuel oil (BBM) as a source of energy is still 63% of all national final energy consumption (Figure 1).

Figure 1. The role of fuel is energy still 63% in the National Final Energy Consumption - 2003



Sources: Presentation material from Dept.ESDM, National Energy Management Blueprints, 2005

The high demand of fuel oil (BBM) is consequences of the growth of the automotive industry are increasing. This is evident from the consumption of fuel in recent years. In 1999, new fuel consumption of 23.9 million kilo liters, but a year later increased to 26.2 million kilo liters. For 2004, the transportation sector's fuel consumption has reached 30.7 million kiloliters, and predicted to continue rising in coming years, and in 10 years, transport energy consumption is expected to increase two-fold. Growth in the period 2000-2010 increased by an average 7.3% per year.

Figure 2. Gasoline Demand in Transportation Sector

Source : Pertamina Direktorat PDN, dalam Laporan Tugas Akhir Gandik Putu Wiria, 2006

Growth of automotive industry national figures shows a significant increase. It is obviously a very lucrative market, remember, almost all motor vehicles that use fuel oil (Figure 2 and Figure 3). Use of the highest energy contained in the transport sector, especially private cars, public passenger cars and motorcycles

Figure 3. Percentage of Energy Utilization From The View Point of Vehicle

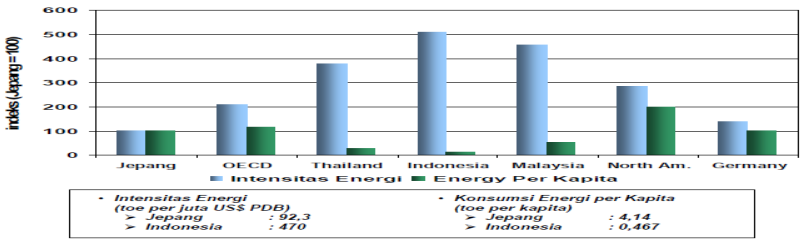
JENIS KENDARAAN	PENGGUNAAN ENERGI
Mobil penumpang (pribadi & taksi)	34 %
Truck (mobil angkutan barang)	32 %
Sepeda motor	13 %
Bis	9 %
Angkutan laut	7 %
Angkutan udara	4 %
KA & Angkutan sungai / danau	1 %

Source : Warta Pertamina, 2004

However public access to energy is still limited given the extent of coverage to meet the energy needs for the community (Figure. 4.) Caused by the limited energy infrastructure. To support this requirement is necessary to put forward the private role in the development of energy infrastructure.

As stipulated by the Oil and Gas Act No.22 of 2001 the duty and authority PT.Pertamina (Persero) as a major player in oil and gas sector is also limited its role to just act as carriers KKKS (Contra Work Cooperation) with BP Migas managers as the agency manager the Upstream oil and gas Industry representing the Republic of Indonesia.

Figure 4. Energy Consumption Per Capita VS Intensity of Energy



Source : ESDM Department, Blue Print of National Energy Management, 2005

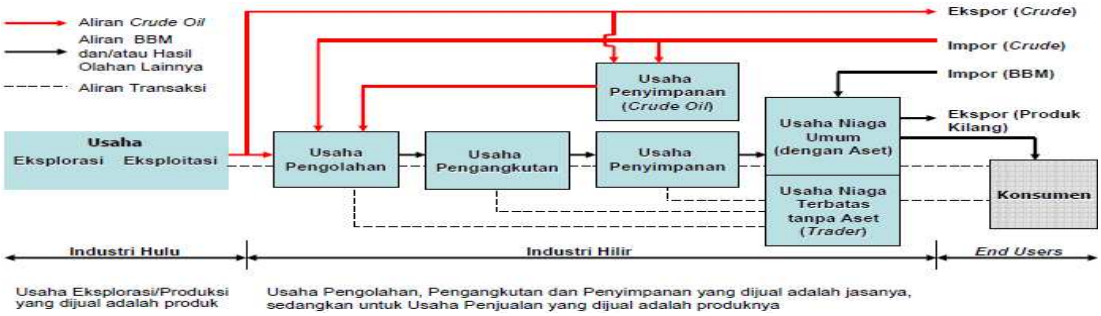
Based on the regulation, government can cooperate with private multinational as well as global company to manage Oil and Natural Gas Corporation in upstream and downstream in order to fulfill the need of oil and natural gas in Indonesia. These conditions ask PT. Pertamina to work harder so that they can compete with another multinational or global company. They can compete using many method and style, for example, exploring as well as finding the new place or the new oil-mill area, improving the productivity of oil and natural gas in the new field as well as in the brownfield, improve the quantity and the quality of oil-mill, refinery, and the trade of oil and natural gas, and of course to improve the quality and the quantity of distribution in all of the island and province in Indonesia. For PT. Pertamina these conditions can be a good opportunity to improve their business with concerning the safe oil and natural gas efficiently. The strategy can be obtained by improving the infrastructure as well as the technology, the safety, concern to the environment, and good service to the consumer. Infrastructure establishment for distribution of gasoline will be more effective if PT. Pertamina apply the business portfolio distribution and corporate with third party such as private company as the investor. The infrastructure facility such as oil-mil, oil and gas processing plant, oil and gas storage or depot, oil and gas delivery transporter, and oil and gas trading facility (Figure.5.)

Most of the gasoline filling depot are located near the Batang Hari River in Jambi. Nowadays Batang Hari's water surface condition has reached critical condition due to forest logging in the upstream area (which supposed to be functioned as catchment area). The condition has caused erosion which turn into river silting phenomenon in Batang Hari River. The gasoline delivery will get more difficult if the rainy season move, so that water surface of Batang Hari River will also be decreasing. In the beginning of September 2009 water surface has decreased critically and caused trouble into the

river transportation as well as the gasoline delivery and transportation. This phenomenon is affecting the economic condition of Jambi.

In 2007 and 2008 the distribution of gasoline in the level 1 of Jambi Province was disturbed by the silting of the Batanghari River flow, making the gasoline carrying tanker from Plaju-Palembang oil-mill, South Sumatera, and Tanjung Uban couldn't dock to Pertamina Depot of the city of Jambi, resulting in scarcity of gasoline.

Figure 5. Fields in the Structure of National Oil



Source : ESDM Department, Blue Print of National Energy Management, 2005

Based on that, the Government of level one of Jambi Province made a proposal to PT. Pertamina (Persero) to move the depot in Jambi to get closer to the threshold of Batang Hari river in the city of Kota Muara, the regency of East Tanjung Jabung. The distance of Pertamina Depot in Jambi from the outer threshold is as far as 180 miles whereas the city of Muara Sabak is only 18 miles far from the outer threshold (Antara, 2009).

Figure 6. Batang Hari River Condition in Dry Season

The plan for the development of Pertamine depot in the regency of East Tanjung Jabung Timur (Tanjabtim) which is located in the east coast of Jambi Province was seen very critical for the sake of good distribution of gasoline in Jambi Province and give the illustration of business prospect of the project development and fuel storage with the capacity of 35.000 Kl in the downstream of Sabak, East Tanjung Jabung, Level 1 of Jambi Province.

2.2. The Increase of the need for fuel use in Jambi Province

2.2.1 The sales of the fuel

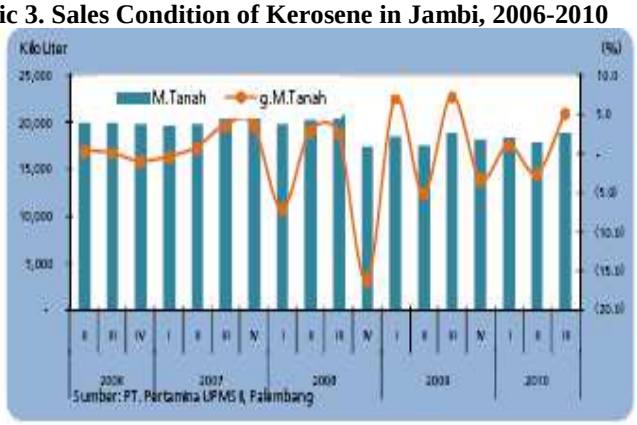
The data of the need for fuel in Jambi Province per month, such as 20.000 tons for premium, whereas for diesel fuel is 25.000 tons. Based on the data of premium fuel sale development, the sale of diesel fuel and kerosine increased as there was a development of the use of obile vehicle, such as

motorcycle, buses, pickup and industrial equipment using fuel, there was a significant increase as there was also an increase on the economy of Level 1 Jambi Province.

Graphic 1. The development of Premium fuel sale in Jambi province year 2006-2010

Graphic 2. The development of Diesel fuel sale in Jambi Province year 2006-2010

Graphic 3. Sales Condition of Kerosene in Jambi, 2006-2010



3. Profile of Jambi Province

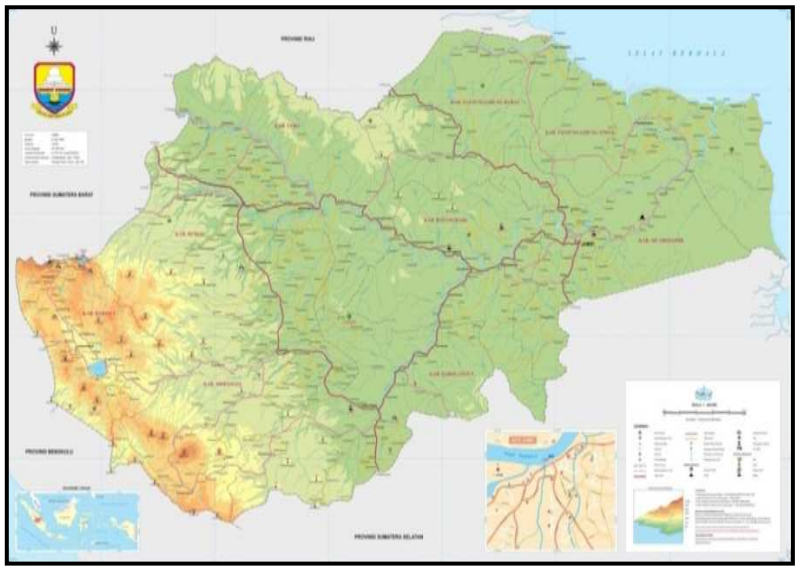
3.1 Demographic condition of Level I Region of Jambi Province

3.1.1 geographic and Climate

Luas wilayah Provinsi Daerah Tingkat I Jambi adalah 53.435 km^2 yang terdiri dari 10 (Sepuluh) Kabupaten dan 1 (Satu) Kota Kotamadya

The area of level I region of Jambi Province is 53.435 km^2 and separated into ten regency and one city.

Figure 7. Level I Region of Jambi Province



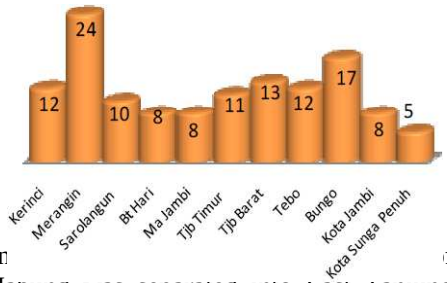
Tabel 1. Kabupaten di Provinsi Tingkat I Jambi

Table 1. regency in Level I region of jambi Province

No	Kabupaten/Kota Regency/City	Ibu Kota Kabupaten/Kota Capital City	Jarak ke Ibu Kota Propinsi (km) Distance to Capital City
1	Kerinci	Sungai Penuh	419,21
2	Merangin	Bangko	255,03
3	Sarolangun	Sarolangun	179,29
4	Muaro Jambi	Sengeti	58,93
5	Batang Hari	Mara Bulian	27
6	Tanjung Jabung Timur	Muara Sabak	129,44
7	Tanjung Jabung Barat	Kuala Tungkal	130,78
8	Tebo	Muara tebo	205,80
9	Bungo	Muara Bungo	251,60
10	Kota Jambi	Kota Baru	0
11	Sungai Penuh	Sungai Penuh	418

Source : www.jambiprov.go.id

Graphic 4. Percentage of Area and Number of Subdistrict in Regency & City in Jambi



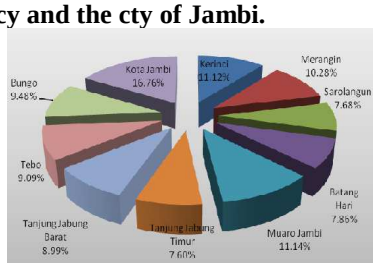
Source : Central Bureau of Statistic, Profile of Jambi, 2008

Muara Sabak is the capital city of East Tanjung Jabung (Tan f Tanjung Jabung Regency. After the separation, Tanjung Jabung was separated into East Tanjung Jabung (Tanjatim) and West Tanjung Jabung (Tanjabar), with Kuala Tungkal City as the capital city of Tanjabar. Distance from the capital city of Jambi to Muara Sabak City is 129.44 km, while area of Tanjabtim is 5.330 km^2, and located 4m above sea level. Based on Jambi climatology station in 2008, the biggest rainfall was in march, 315.4 mm, and the smallest rainfall was in June, 64.8 mm. while the number of rainy days in a year was in October until December (19-21 days/month), and the smallest number was in February (8 days/month).

3.1.2. Population

Based on the projection of population survey between survey, in 2005, the number of Jambi province population in 2009 would be 2.826.000. As a part of that number, the total amout of the population in Tanjabtim regency was 211.789 persons with the ratio of the population 40 persons/km^2.

Graphic 5. Percetage of Population number and population above the age of 15 year-old working based on the fields in the Regency and the cty of Jambi.



Source: Central Bureau of Statistic, Profile of Jambi, 2009

Tabel 2. Population projection, labour and unemployment level in Jambi Year 2009-2011

No	Keterangan Information	2009	2010	2011
1	Pertumbuhan (%)/Development	1.84	1.73	1.67
2	Jumlah Angkatan Kerja (Orang) Working Group Number	1,182,820.00	1,183,211.00	1,183,601.00
3	Jumlah Kesempatan Kerja (Orang) the amount of working opportunity (people)	1,109,302.00	1,111,485.00	1,113,699.00
4	Tingkat Pengangguran (Orang)	73,518.00	71,726.00	69,902.00
	Pertumbuhan (%) Development	(2.74)	(2.44)	(2.54)
5	Prosentase Pengangguran dari Angkatan Kerja (%) Percentage of unemployment from working group	6.22	6.06	5.91

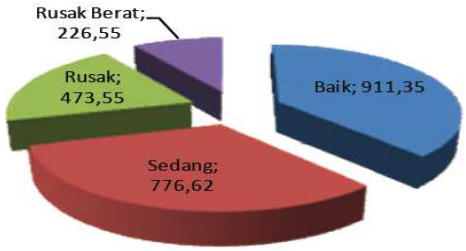
Source : www.jambiprov.go.id/download/rkpd-2010.pdf

3.1.3 Transportation

3.1.3.1 Road Lenght

The road as the infrastructure for economic activity and the increase of development will ease population mobility and inter-region trade. The lenght of the road in Jambi Province in 2008 was 2.387,08 km.

Graphic 6. Lenght of National, Province, Regency & City road according to road condition (km)

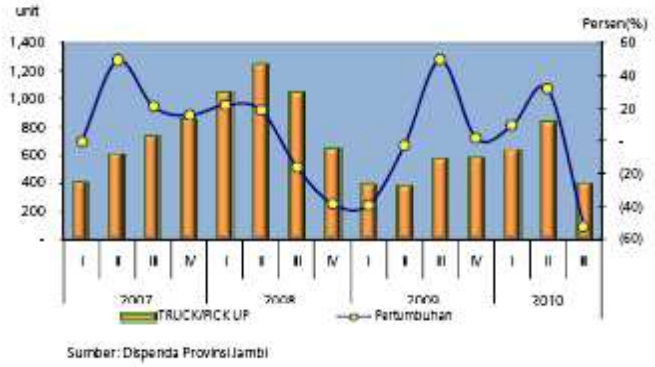


Source : Central Bureau of Statistic, Profile of Jambi, 2008

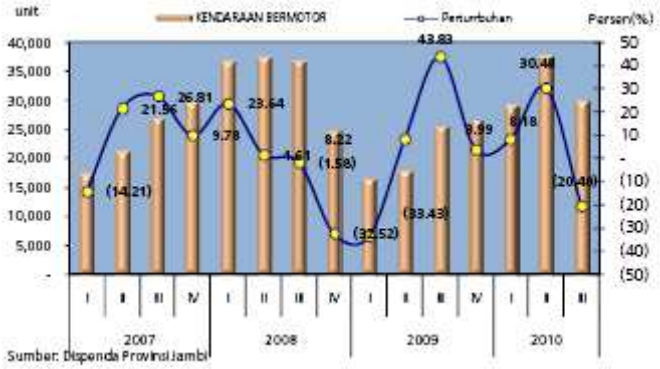
3.1.3.2 Number of Vehicle

Number of vehicle, public vehicle as well as private vehiclein 2007-2010 had increased (graph 7, 8, and 9).

Graph 7. The Increasing of New Truck and Pickup Registration in Jambi, 2007-2010



Graph 8. The Increasing of New Vehicle Registration in Jambi, 2007-2010



Graph 9. The Increasing of New Motorcycle Registration, 2007-2010

Table 3. The Increasing of City and Province Public Transportation (AKAP) in Jambi Province, 2007-2010

No	Jenis Kendaraan Vehicle	2007	2008	2009
1	PO	31	33	34
2	Bus	443	457	470

Source : Directorat General Land Transport, 2009

Tabel 4.Perkembangan Angkutan Parawisata di Provinsi Jambi Tahun 2007-2009
Table 4. The increasing of Tourism Transportation in Jambi Province, 2007-2010

No	Jenis Kendaraan Vehicle	2007	2008	2009
1	PO	2	1	4
2	Bus	17	5	31

Source : Directorat General Land Transport, 2009

4. Opportunities of Gasoline Filling Depot Based on Investment Point of View

In order to fulfill the needs of gasoline in Jambi Province during the dry season, Jambi local government suggests PT. Pertamina to cooperate with another private company as the investor to establish new gasoline filling depot. Based on the calculation has done by PT. Pertamina (UPMS II), the dispatch cost of refined oil from Plaju-Palembang oil-mill to gasoline filling depot in Jambi City (existed gasoline filling depot which belong to PT. Pertamina) is estimated Rp.72/l in normal condition. The dispatch cost is divided into three specific cost, delivery cost, carrying cost, and storage cost. If the climate condition is not normal, for example the long dry season, it will make the cost more expensive due to the change of distribution process as well as the longer chain distribution. As the result of longer dry season, the smaller cargo ship is needed to carry the oil to the existed gasoline depot.

Gambar 4. Letak Rencana Depot BBM Muara Sabak
Figure 4. Location Plan for Gasoline Filling Depot in Muara Sabak

5. Analysis of Feasibility

5.1. Analysis of Economic potential of The Fuel Storage Project- Muara Sabak, Level I Region Jambi Province.

The analysis of fuel storage establishment project had done based on simulation and engineering data. Detail of the calculation is used as the investment furtherance, and in order to get the result that close to the reality, this calculation has been verified using Capital Expenditure (CAPEX) as well as re-calculate process. Especially for the steel material, which is predicted will get more expensive in 2010. CAPEX was done based on the increasing of iron and steel material, with an increase of 30% compared to 2009.

ESTIMATION BASED ON THE INCREASE IN STEEL MATERIAL IN MAY 2010

• Construction Cost (EPC)	Rp	82,889,493,050.78
• Profit Contractor	Rp	8,288,949,305.08
• Insurance During Construction	Rp	663,115,944.00
Total Construction Cost	Rp	91,841,558,300.27
PPN 10%	Rp	9,162,868,885.00

National Income tax 10%
TOTAL CAPITAL EXPENDITURE Rp 100,791,557,736.52
PREDEVELOPMENT COST Rp 14,000,000,000.00

- 52 Ha Tanah lama
- 52 Ha of existed land
- Pembelian 70% Saham
- Acquisition of 70% share
- Operating Lisence Cost
- Commitment Cost Etc
- Business Development

PEMINDAHAN LOKASI PROYEK
REMOVAL OF PROJECT LOCATION

- Beli Tanah 9.2 Ha Rp 1,500,000,000.00
- Land Purchasing, 9.2 Ha
- Pekerjaan Urug dan Pemadatan Rp Rp 4,000,000,000.00
- Land and soil filling
- Pekerjaan Pembuatan Jalan (200M) Rp 1,500,000,000.00
- Road construction (200m)

Management & Indirect Cost Rp 5,500,000,000.00
Interest During Constructions Rp 11,900,000,000.00

TOTAL PROJECT COST Rp 139,425,714,130.00

Based on the calculation had been done, without any of these cost:

- Sondir
- Boring
- Loading Test
- Topography
- Bathymetry
- Analisa Sedimentasi
- Sedimentation analysis
- Engineering Design

Can be concluded that the cost will increase about Rp. 4.000.000.000 or 3.5% of the total project cost. The costs above were not calculated because these cost was included in the pre-development cost which should be done in the beginning of the project.

The calculation had been done shows that the mean cost per kiloliter is:

- 2011 ESTIMATION COST
  Rp 139,425,714,130.00 : 35,000 Kl = Rp 3,983,592 Per KL

6. Conclusion and sugession

6.1. Conclussion

Fuel storage project calculation had been done using Microsoft Excel, and we got (in Indonesian Rupiahs), project parameters:

- IRR Loan 20.79%
- IRR Investment 16.96%
- NPV Loan – Rp 107,168,879
- NPV Investment – Rp 81,818,749

- Profitable Index – 1.6
- Pay back Loan – 5.55 Tahun
- Pay back Investment – 6.51 Tahun
- Nilai Tukar USD – Rp 9,500
- USD exchange rate – Rp. 9500

The decreasing of cost and the increasing of repayment Through Put Fee in the second year with the value of Rp. 55 million per litershows us that this project is good to be done or feasible. While the market price for this kind of establishment of fuel storage depot in frontier or grass road area (remote area) is around Rp. 4.000.000 up to 4.5000.000 per kiloliter, or approximately 86% of the market price today. Thus the investment price is Rp. 3.714.000 per kiloliter, or 82% of the upper price or 92% of the bottom price.

6.2. Suggestion

- Disarankan para pihak pemangku kepentingan *(stakeholder)* untuk memungkinkan pengusahaan secepatnya terhadap pembangunan depot tangki penimbunan secepatnya guna menjaga kontinuitas penyaluran BBM di Provinsi Jambi.
- In order to keep the continuity of the dispatch of gasoline as well as to fulfill the demand and the need in Jambi Province, it would be better if stakeholder take this opportunity.
- Melakukan studi lanjutan lainnya tentang pembangunan Tangki LPG *(LPG Spherical Tank)* gunamelanjutkan program Pemerintah akan konversi minyak tanah ke gas LPG guna mengurangi subsidi BBM, serta memenuhi keamanan energi *(energy security)* di Provinsi Jambi.
- Further research about the establishment of LPG Spherical Tank is needed in order to continue the government program concerning the conversion of kerosene to the gas to cut the cost as well as to cut the gasoline subsidy, and needless to say that it also needed to fulfill the energy security in Jambi Province.

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About the Author

Zulkifli Rangkuti, born in Jakarta on December 20, 1967. In 2009 succeeded in getting his Ph.D in Natural Resources & Enviroment Management Program of the Bogor Agricultural Institute (IPB). Holders of Class A Certificate Plus EIA. Since 1993 to 2009 the author worked at several Bank of Conventional and Islamic Banking in the Corporate Banking sector with his last position as Senior Vice President (Head Division) on one of the National Private Banks. Interest in Natural Resources and Environment when the author served as Department Head (Asistant Vice President) at The Largest Islamic Bank owned by PT. Bank Mandiri (Persero) Tbk, mostly managing corporate accounts Mining, Oil and Gas and Energy. The activities of Mining, Oil and Gas and Energy follow the author during a visit to the prospective borrower, the author is still a lot to see activities Mining, Oil and Gas and Energy are still very concerned about the environment, either at the time of Exploitation, Exploration (Upstream) and the activities of downstream (Down Stream). This condition makes the author very concerned about the environmental sector in particular on the activities of the Oil and Gas Mining, as the banker usually do not pay attention to the environmental impact of the activities of both Mine Mineral Mining and Oil and Gas. Environmental risk factors (Environment Risk) could have occurred because of lack of attention to environmental impacts, as corporate account manager should be given about the environmental dimension as well as in Bassel IV in the management of risk management (Risk Management). Global Climate Change today must also be aware of the Financial Services Industry Banking in particular, because if not taken into account environmental factors, the impact of the risk to the money already invested will be difficult to return. Currently working as a writer or lecturer Lecture various universities both private and state with NIDN No. 0320126703, at the Graduate School (S3 and S2). Daily activities in the field of Oil and Gas is the Commissioner (Independent) Group Moga engaged in EPCI (Engineering, Procurement, Contractor, Installation) & Investment for Oil and Gas.