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Analysis of Financial Feasibility of Construction of a Stainless-Steel Factory Capacity 1500 KTPA at PT. X in the IMIP Morowali Area

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Abstract

This study was conducted to test the financial viability of building a stainless-steel plat on PT. X using method of financial analysis. The result of this study showed with net present value (NPV) US$ 901,972,225.60; Internal Rate of Return (IRR) of 15%; MARR 10%; Payback (PP) for 4 year and BEP US$372.39/ton for production 1,500,000/year. According to analytical research, the planned construction of the PT.X is a financially viable business to run and the project is acceptable. Each of these methods yields a distinct value for the computation of the payment duration. The investment proposal is deemed suitable based on the computation of the net present value, profitability index, and internal rate of return, as they meet the corresponding eligibility conditions. The inclusion of the time value of money is crucial when calculating the return period using NPV, ROI, and IRR. This ensures that the project's long-term benefits are taken into account. Consequently, it can be inferred that the assessment of the proposal's financial viability can be deemed acceptable or appropriate.

Keywords: feasibility, analysis financial, nickel pig iron (NPI), stainless steel.

INTRODUCTION

Indonesia has a wealth of promising natural resources in the form of minerals and coal. Minerals and coal or commonly called Minerba are non-renewable natural resources so their processing must be carried out optimally and sustainably. Apart from that, utilization must be directed to the greatest extent possible for the welfare and prosperity of the people, in accordance with the mandate contained in the 1945 Constitution of the Republic of Indonesia Article 33 Paragraph 3.

Investment in the natural resource-based downstream sector has a vital role in supporting strategic capital investment targets. The down streaming of natural resource-based industries is very relevant to the condition of Indonesia which has abundant biological, mineral and mining wealth. One of the natural resource sectors that is important to develop downstream in order to fulfill domestic industrial raw materials is the nickel commodity

Currently, there are only four products of nickel produced in Indonesia: Ferronickel (FeNi), Nickel Pig Iron (NPI), Nickel Matte and Nickel Sulphate. All FeNi and matte nickel produced are exported to China and Japan. Meanwhile, part of the domestic NPI produced is exported abroad and the other part is further processed into stainless steel. A total of 4 stainless steel smelting factories are integrated with the NPI smelting factory, namely PT Guang Ching Nickel and Stainless Steel, PT Indonesia Tsingshan Stainless Steel, PT Sulawesi Mining Investment, and PT Obsidian Stainless Steel. Three other companies focus on forming stainless steel, including PT Indonesia Ruipu Nickel and Chrome Alloy, PT Jindal Stainless

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Indonesia, and PT IMR ARC Steel. The integration of NPI melt and stainless steel creates a competitive process due to the use of NPI melt which reduces energy consumption significantly

Remembering that since January 1 2020, the President of the Republic of Indonesia, namely Mr Jokowi Widodo, has stopped the export of nickel raw materials, which has shown positive results for the Indonesian economy. One of the aims of stopping nickel exports is to encourage domestic down streaming, namely to optimize the added value of this commodity by processing it into value-added products such as steel. This was stated by him, "Down streaming, we have started to stop exporting nickel raw materials, then everything must be downstream." As a result, we are starting to see that our iron and steel exports in the past half year have reached around US$10.5 billion, according to Mr Jokowi Widodo (CNBC Indonesia).

The success of the nickel downstream program in Indonesia has provided significant benefits to the economy and industry, one of the successes of down streaming is in the iron and steel industry. This was explained by the coordinating minister for Maritime Affairs and Investment (Menko Marinves) Mr Luhut Binsar Pandjaitan. "This year it will reach US$ 21 billion (steel and iron exports) you can imagine the impact." We calculate that by 2024, this process of downsizing the book will reach US$34 billion - US$45 billion (Bisnis.com).

Nickel downstream products produce Nickel Pig Iron (NPI), Ferro Nickel (FeNi) to Ferro Crome. This product can be processed into several steel products. Such as cold rolled steel, hot rolled steel and steel slab.

According to data from the Central Statistical Agency (BPS) and Trademap, steel products have increased from 2018 to 2020, reaching an export figure of 16 million tons. Significant contributions from steel exports indicate that the national steel industry has grown to become increasingly important to the national economy.

In accordance with the plan for down streaming strategic investment in mineral commodities, especially nickel, which has been included in the roadmap document for down streaming strategic investment in mineral commodities in 2045, which includes a plan to develop a stainless-steel industry in the form of rods, bars, pipes, HRC, CRC with a capacity of 1.5 million tons in the next year. 2025-2029 so it requires a comprehensive financial feasibility document that is able to attract national and global investors.

METHOD

To ensure that the outcome of variable revenue and expenditure and cash flow are adequate and ready to be created, accurate calculation must be made from the very beginning of factory planning. The following information is required to assess a project's viability from an economic and financial standpoint: Amount of investment needed, total amount spent on production, the total amount spent on non-production expenses.

In the journal Pani & Saldy (2021) Net Present Value (NPV) is a method of calculating the net value at present time. Based on the NPV, an investment can be classified as eligible or ineligible if: NPV > 0 means that the investment will be profitable/feasible. NPV < 0 means the investment is unprofitable/ineligible.

Internal Rate Return (IRR) the average annual internship rate (IRR) of the entity making the investment, expressed in percentage units. An investment is deemed eligible when its value exceeds the applicable interest rate and vice versa. The internal rate return (IRR) rate highest interest rate that the project can pay for the resources used. The formula by (Rusdianto et al., 2018) :

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$$IRR = i + \frac{NPV}{NPV - NPV'}(i' - i)$$

Description:
i = discount rate that produces positive NPV
i' = discount rate which produces negative NPV
NPV = positive value
NPV = negative value

Payback period indicates how long an investment will return the money. The smeller the payback period, the faster the investment will return the money and the lower the risk. Formula:
Payback period = $\frac{I}{A^b}$
Description:
I = The size of investment required
Ab = Net benefit that can be obtained annually

Quantitative research is the systematic scientific investigation of components and phenomena, as well as the relationship between them. (Abdullah et al., 2021)

RESULT AND DISCUSSION

Tabel 1 shows the cost of investment and depreciation required by a company to operate and as capital whose purpose is to generate future profits through the sale of product.

Table 1. Investment and Depreciation

Investment	$ 763,431,919.03
Depreciation	$ 23,569,313.41
Investor Capital 40%	$ 305,372,767.61
Bank Capital 60%	$ 458,059,151.42

Calculating the Return on Investment (ROI) for a project is crucial for both establishing and expanding a firm. It is often the primary challenge that impedes progress, whether due to insufficient funding or a complete absence thereof. The plants construction plan is 40% sources from self and 60% source from bank. Loan is US$ 458,059,151.42; Time (n) 10 years and interest 12%.

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Table 2. Return on Investment

Year	Loan	12% Interest	Installments	Payment
0	$ 458,059,151.42			
1	$ 431,957,033.54	$ 54,967,098.17	$ 26,102,117.88	$ 81,069,216.05
2	$ 402,722,661.52	$ 51,834,844.02	$ 29,234,372.02	$ 81,069,216.05
3	$ 369,980,164.85	$ 48,326,719.38	$ 32,742,496.67	$ 81,069,216.05
4	$ 333,308,568.58	$ 44,397,619.78	$ 36,671,596.27	$ 81,069,216.05
5	$ 292,236,380.76	$ 39,997,028.23	$ 41,072,187.82	$ 81,069,216.05
6	$ 246,235,530.40	$ 35,068,365.69	$ 46,000,850.36	$ 81,069,216.05
7	$ 194,714,578.00	$ 29,548,263.65	$ 51,520,952.40	$ 81,069,216.05
8	$ 137,011,111.31	$ 23,365,749.36	$ 57,703,466.69	$ 81,069,216.05
9	$ 72,383,228.62	$ 16,441,333.36	$ 64,627,882.69	$ 81,069,216.05
10	$ 0.00	$ 8,685,987.43	$ 72,383,228.62	$ 81,069,216.05

The company has to pay the cost of raw materials to buy raw material then processed to produce the final product. To make stainless steel follows the calculation of the price of materials and total raw materials for each price change inflation reaches 5%

Table 3. Price of Raw Materials

No	Material	Price ($)
1	Nickel Pig Iron	117
2	Scrap	521
3	Ferrochromium	929
4	Silicomanganese	800
5	Flucal	500
6	Lime	156
7	Cao	924
8	O2	1,300
9	N2	250

On the planned stainless steel plant capacity of 1,500,000 here's the volume of raw materials used.

Table 4. Volume Capacity Raw Materials

No	Material	Volume ton/year
1	Nickel Pig Iron	847,094
2	Scrap	247,443
3	Ferrochromium	278,747
4	Silicomanganese	125,688
5	Flucal	5,034
6	Lime	69,058
7	CO2	83,123
8	O2	92,600
9	N2	43,000

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The company has to pay direct labor and indirect labor. The total of direct labor is 240 and the indirect labor is 106, the table shows the salary on the labor required.

Table 5. Labor Direct and Indirect

J	Operator Position	Wages/Month	Wages/Year	The Amount of Costs
240	Operator	$ 355	$ 4,258	$ 1,021,935
2	President Director	$ 5,806	$ 69,677	$ 139,355
1	Director of Operations	$ 3,226	$ 38,710	$ 38,710
1	Director of Finance	$ 3,226	$ 38,710	$ 38,710
1	Director of Engineering	$ 3,226	$ 38,710	$ 38,710
1	Director of Business Development	$ 3,226	$ 38,710	$ 38,710
1	Director of Industrial Relations	$ 3,226	$ 38,710	$ 38,710
1	Operations Manager	$ 2,258	$ 27,097	$ 27,097
1	Production Manager	$ 2,258	$ 27,097	$ 27,097
1	Technology Manager	$ 2,258	$ 27,097	$ 27,097
1	Asset Manager	$ 2,258	$ 27,097	$ 27,097
1	Risk Management Manager	$ 2,258	$ 27,097	$ 27,097
1	Industrial Relations Manager	$ 2,258	$ 27,097	$ 27,097
1	CSR Manager	$ 2,258	$ 27,097	$ 27,097
1	Marketing Manager	$ 2,258	$ 27,097	$ 27,097
1	Supply Chain Manager	$ 2,258	$ 27,097	$ 27,097
1	Project Management Manager	$ 2,258	$ 27,097	$ 27,097
1	HSE Manager	$ 2,258	$ 27,097	$ 27,097
1	HR Manager	$ 2,258	$ 27,097	$ 27,097
1	Procurement Manager	$ 2,258	$ 27,097	$ 27,097
1	Outsourcing Manager	$ 2,258	$ 27,097	$ 27,097
1	Assistant Operations Manager	$ 968	$ 11,613	$ 11,613
1	Assistant Production Manager	$ 968	$ 11,613	$ 11,613
1	Assistant Technology Manager	$ 968	$ 11,613	$ 11,613
1	Assistant Asset Manager	$ 968	$ 11,613	$ 11,613
1	Risk Management Assistant Manager	$ 968	$ 11,613	$ 11,613
1	Industrial Relations Assistant Manager	$ 968	$ 11,613	$ 11,613
1	CSR Assistant Manager	$ 968	$ 11,613	$ 11,613
1	Marketing Assistant Manager	$ 968	$ 11,613	$ 11,613
1	Supply Chain Assistant Manager	$ 968	$ 11,613	$ 11,613
1	Project Management Assistant Manager	$ 968	$ 11,613	$ 11,613
1	HSE Assistant Manager	$ 968	$ 11,613	$ 11,613
1	HR Assistant Manager	$ 968	$ 11,613	$ 11,613
1	Procurement Assistant Manager	$ 968	$ 11,613	$ 11,613
1	Outsourcing Assistant Manager	$ 968	$ 11,613	$ 11,613
10	Operations Staff Manager	$ 516	$ 6,194	$ 61,935
8	Production Staff Manager	$ 516	$ 6,194	$ 49,548
5	Staff Manager Technology	$ 516	$ 6,194	$ 30,968
5	Staff Manager Asset	$ 516	$ 6,194	$ 30,968

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J	Operator Position	Wages/Month	Wages/Year	The Amount of Costs
5	Staff Manager Risk Management	$ 516	$ 6,194	$ 30,968
5	Staff Manager Industrial Relations	$ 516	$ 6,194	$ 30,968
4	Staff Manager CSR	$ 516	$ 6,194	$ 24,774
4	Staff Manager Marketing	$ 516	$ 6,194	$ 24,774
5	Staff Manager Supply chain	$ 516	$ 6,194	$ 30,968
4	Staff Manager Project Management	$ 516	$ 6,194	$ 24,774
5	Staff Manager HSE	$ 516	$ 6,194	$ 30,968
5	Staff Manager HR	$ 516	$ 6,194	$ 30,968
3	Staff Manager Procurement	$ 516	$ 6,194	$ 18,581
3	Staff Manager Outsourcing	$ 516	$ 6,194	$ 18,581
Total Salary/Years				**$ 2,336,516**

Next the company has to pay other costs such as maintenance, insurance, electricity and engine prices on stainless steel plant planning. Table 6 shows other cost.

Table 6. Other Cost

No	Other Cost	Total Cost/Years
1	Office Electricity	$ 4,500,000.00
2	Electricity Machine	$ 16,294,583.85
3	Maintenance	$ 20,748,937.50
4	Insurance	$ 3,750,000.00
Total		$ 45,293,521.35

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Table 7 below shows the profit and loss per year at PT. X stainless steel construction.

Table 7. Profit and Loss Projection

No	Description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
1	Sale	$ 1,430,289,445.60	$ 1,474,554,884.13	$ 1,544,043,791.09	$ 1,619,016,699.25	$ 1,697,988,450.65	$ 1,780,952,285.39	$ 1,868,074,935.60	$ 1,959,558,217.87	$ 2,055,621,329.04	$ 2,156,505,434.75
2	Minus COGS	$ 877,478,187.48	$ 904,634,898.24	$ 947,266,129.50	$ 993,261,778.68	$ 1,041,710,705.92	$ 1,092,608,764.04	$ 1,146,058,242.70	$ 1,202,182,955.75	$ 1,261,117,379.78	$ 1,323,009,469.17
	Gross Profit	$ 552,811,258.12	$ 569,919,985.89	$ 596,777,661.59	$ 625,754,920.57	$ 656,277,744.73	$ 688,343,521.35	$ 722,016,692.90	$ 757,375,262.12	$ 794,503,949.26	$ 833,495,965.58
	Minus Commercial Expenses										
3	Administrative Burden	$ 25,912,400.00	$ 27,208,020.00	$ 28,568,421.00	$ 29,996,842.05	$ 31,496,684.15	$ 33,071,518.36	$ 34,725,094.28	$ 36,461,348.99	$ 38,284,416.44	$ 40,198,637.26
	Marketing Expenses										
	Delivery	$ 108,000.00	$ 113,400.00	$ 119,070.00	$ 125,023.50	$ 131,274.68	$ 137,838.41	$ 144,730.33	$ 151,966.85	$ 159,565.19	$ 167,543.45
	Interest Expense	$ 54,967,098.17	$ 51,834,844.02	$ 48,326,719.38	$ 44,397,619.78	$ 39,997,028.23	$ 35,068,365.69	$ 29,548,263.65	$ 23,365,749.36	$ 16,441,333.36	$ 8,685,987.43
	Total Commercial	$ 80,987,498.17	$ 79,156,264.02	$ 77,014,210.38	$ 74,519,485.33	$ 71,624,987.06	$ 68,277,722.46	$ 64,418,088.26	$ 59,979,065.20	$ 54,885,314.99	$ 49,052,168.14
	Operating Profit	$ 471,823,759.94	$ 490,763,721.86	$ 519,763,451.20	$ 551,235,435.24	$ 584,652,757.67	$ 620,065,798.89	$ 657,598,604.65	$ 697,396,196.93	$ 739,618,634.27	$ 784,443,797.43
	Minus 22% Income tax	$ 103,801,227.19	$ 107,968,018.81	$ 114,347,959.26	$ 121,271,795.75	$ 128,623,606.69	$ 136,414,475.76	$ 144,671,693.02	$ 153,427,163.32	$ 162,716,099.54	$ 172,577,635.44
	Minus PPN 11%	$ 157,331,839.02	$ 162,201,037.25	$ 169,844,817.02	$ 178,091,836.92	$ 186,778,729.57	$ 195,904,751.39	$ 205,488,242.92	$ 215,551,403.97	$ 226,118,346.19	$ 237,215,597.82
	Net Profit	$ 210,690,693.74	$ 220,594,665.80	$ 235,570,674.92	$ 251,871,802.57	$ 269,250,421.41	$ 287,746,571.74	$ 307,438,668.71	$ 328,417,629.64	$ 350,784,188.54	$ 374,650,564.18

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Table 8. Projected Cash Flow Stainless Steel Plant

Description	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Income (Inflow):											
Loan	$ 458,059,151.42										
Capital	$ 305,372,767.61										
Net Profit		$ 210,690,693.74	$ 220,594,665.80	$ 235,570,674.92	$ 251,871,802.57	$ 269,250,421.41	$ 287,746,571.74	$ 307,438,668.71	$ 328,417,629.64	$ 350,784,188.54	$ 374,650,564.18
Depreciation		$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41
Total Income	$ 763,431,919.03	$ 234,260,007.15	$ 244,163,979.21	$ 259,139,988.33	$ 275,441,115.98	$ 292,819,734.82	$ 311,315,885.15	$ 331,007,982.12	$ 351,986,943.04	$ 374,353,501.95	$ 398,219,877.58
Expenditure (Outflow)											
Investment	$ 763,431,919.03										
Principal		$ 26,102,117.88	$ 29,234,372.02	$ 32,742,496.67	$ 36,671,596.27	$ 41,072,187.82	$ 46,000,850.36	$ 51,520,952.40	$ 57,703,466.69	$ 64,627,882.69	$ 72,383,228.62
Total Expenditure	$ 763,431,919.03	$ 26,102,117.88	$ 29,234,372.02	$ 32,742,496.67	$ 36,671,596.27	$ 41,072,187.82	$ 46,000,850.36	$ 51,520,952.40	$ 57,703,466.69	$ 64,627,882.69	$ 72,383,228.62
Income - Outcome	$ -	$ 208,157,889.27	$ 214,929,607.18	$ 226,397,491.66	$ 238,769,519.71	$ 251,747,547.00	$ 265,315,034.79	$ 279,487,029.71	$ 294,283,476.35	$ 309,725,619.26	$ 325,836,648.97
Cash at the Beginning Of The Year	$ -	$ -	$ 208,157,889.27	$ 423,087,496.45	$ 649,484,988.11	$ 888,254,507.82	$ 1,140,002,054.83	$ 1,405,317,089.61	$ 1,684,804,119.33	$ 1,979,087,595.68	$ 2,288,813,214.94
Year End Cash	$ -	$ 208,157,889.27	$ 423,087,496.45	$ 649,484,988.11	$ 888,254,507.82	$ 1,140,002,054.83	$ 1,405,317,089.61	$ 1,684,804,119.33	$ 1,979,087,595.68	$ 2,288,813,214.94	$ 2,614,649,863.91

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Table 9. Balance Sheet Stainless Steel Plant

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Asset										
Cash	$ 208,157,889.27	$ 423,087,496.45	$ 649,484,988.11	$ 888,254,507.82	$ 1,140,002,054.83	$ 1,405,317,089.61	$ 1,684,804,119.33	$ 1,979,087,595.68	$ 2,288,813,214.94	$ 2,614,649,863.91
Receivable	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Wip Inventory	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Finished Goods Inventory	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Current Activity	$ 208,157,889.27	$ 423,087,496.45	$ 649,484,988.11	$ 888,254,507.82	$ 1,140,002,054.83	$ 1,405,317,089.61	$ 1,684,804,119.33	$ 1,979,087,595.68	$ 2,288,813,214.94	$ 2,614,649,863.91
Fixed Assets										
Land	$ 322,000,000.00	$ 322,000,000.00	$ 322,000,000.00	$ 322,000,000.00	$ 322,000,000.00	$ 322,000,000.00	$ 322,000,000.00	$ 322,000,000.00	$ 322,000,000.00	$ 322,000,000.00
Building	$ 48,990,000.00	$ 48,990,000.00	$ 48,990,000.00	$ 48,990,000.00	$ 48,990,000.00	$ 48,990,000.00	$ 48,990,000.00	$ 48,990,000.00	$ 48,990,000.00	$ 48,990,000.00
Machine And Equipment	$ 392,441,919.03	$ 392,441,919.03	$ 392,441,919.03	$ 392,441,919.03	$ 392,441,919.03	$ 392,441,919.03	$ 392,441,919.03	$ 392,441,919.03	$ 392,441,919.03	$ 392,441,919.03
	$ 763,431,919.03	$ 763,431,919.03	$ 763,431,919.03	$ 763,431,919.03	$ 763,431,919.03	$ 763,431,919.03	$ 763,431,919.03	$ 763,431,919.03	$ 763,431,919.03	$ 763,431,919.03
Minus Accumulated Depreciation	$ 23,569,313.41	$ 47,138,626.82	$ 70,707,940.23	$ 94,277,253.63	$ 117,846,567.04	$ 141,415,880.45	$ 164,985,193.86	$ 188,554,507.27	$ 212,123,820.68	$ 235,693,134.09
Total Fixed Assets	$ 739,862,605.62	$ 716,293,292.22	$ 692,723,978.81	$ 669,154,665.40	$ 645,585,351.99	$ 622,016,038.58	$ 598,446,725.17	$ 574,877,411.76	$ 551,308,098.36	$ 527,738,784.95
TOTAL Fixed	$ 948,020,494.89	$ 1,139,380,788.67	$ 1,342,208,966.92	$ 1,557,409,173.22	$ 1,785,587,406.81	$ 2,027,333,128.20	$ 2,283,250,844.50	$ 2,553,965,007.45	$ 2,840,121,313.29	$ 3,142,388,648.85
Debt	$ 431,957,033.54	$ 402,722,661.52	$ 369,980,164.85	$ 333,308,568.58	$ 292,236,380.76	$ 246,235,530.40	$ 194,714,578.00	$ 137,011,111.31	$ 72,383,228.62	$ 0.00
Total Debt	$ 431,957,033.54	$ 402,722,661.52	$ 369,980,164.85	$ 333,308,568.58	$ 292,236,380.76	$ 246,235,530.40	$ 194,714,578.00	$ 137,011,111.31	$ 72,383,228.62	$ 0.00
Capital										
Capital Stock	$ 305,372,767.61	$ 305,372,767.61	$ 305,372,767.61	$ 305,372,767.61	$ 305,372,767.61	$ 305,372,767.61	$ 305,372,767.61	$ 305,372,767.61	$ 305,372,767.61	$ 305,372,767.61
Retained Earning	$ 210,690,693.74	$ 431,285,359.54	$ 666,856,034.46	$ 918,727,837.03	$ 1,187,978,258.44	$ 1,475,724,830.18	$ 1,783,163,498.89	$ 2,111,581,128.53	$ 2,462,365,317.07	$ 2,837,015,881.24
Total Liabilities	$ 516,063,461.35	$ 736,658,127.15	$ 972,228,802.07	$ 1,224,100,604.64	$ 1,493,351,026.06	$ 1,781,097,597.80	$ 2,088,536,266.50	$ 2,416,953,896.14	$ 2,767,738,084.68	$ 3,142,388,648.85
Total Liabilities and Capital	$ 948,020,494.89	$ 1,139,380,788.67	$ 1,342,208,966.92	$ 1,557,409,173.22	$ 1,785,587,406.81	$ 2,027,333,128.20	$ 2,283,250,844.50	$ 2,553,965,007.45	$ 2,840,121,313.29	$ 3,142,388,648.85

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Table 10. Break Even Point

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Sale	$ 1,434,021,374.08	$ 1,478,286,812.61	$ 1,547,775,719.57	$ 1,622,748,627.74	$ 1,701,720,379.14	$ 1,784,684,213.87	$ 1,871,806,864.08	$ 1,963,290,146.36	$ 2,059,353,257.52	$ 2,160,237,363.23
Fixed Cost										
Indirect Labor	$ 1,267,741.94	$ 1,267,741.94	$ 1,267,741.94	$ 1,267,741.94	$ 1,267,741.94	$ 1,267,741.94	$ 1,267,741.94	$ 1,267,741.94	$ 1,267,741.94	$ 1,267,741.94
Office Electricity and Lighting	$ 4,500,000.00	$ 4,725,000.00	$ 4,961,250.00	$ 5,209,312.50	$ 5,469,778.13	$ 5,743,267.03	$ 6,030,430.38	$ 6,331,951.90	$ 6,648,549.50	$ 6,980,976.97
insurance	$ 3,750,000.00	$ 3,937,500.00	$ 4,134,375.00	$ 4,341,093.75	$ 4,558,148.44	$ 4,786,055.86	$ 5,025,358.65	$ 5,276,626.58	$ 5,540,457.91	$ 5,817,480.81
Maintenance	$ 20,748,937.50	$ 21,786,384.38	$ 22,875,703.59	$ 24,019,488.77	$ 25,220,463.21	$ 26,481,486.37	$ 27,805,560.69	$ 29,195,838.73	$ 30,655,630.66	$ 32,188,412.20
Depreciation	$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41	$ 23,569,313.41
Administrative Expenses	$ 25,912,400.00	$ 27,208,020.00	$ 28,568,421.00	$ 29,996,842.05	$ 31,496,684.15	$ 33,071,518.36	$ 34,725,094.28	$ 36,461,348.99	$ 38,284,416.44	$ 40,198,637.26
Marketing Expenses	$ 108,000.00	$ 113,400.00	$ 119,070.00	$ 125,023.50	$ 131,274.68	$ 137,838.41	$ 144,730.33	$ 151,966.85	$ 159,565.19	$ 167,543.45
Interest Expenses	$ 54,967,098.17	$ 51,834,844.02	$ 48,326,719.38	$ 44,397,619.78	$ 39,997,028.23	$ 35,068,365.69	$ 29,548,263.65	$ 23,365,749.36	$ 16,441,333.36	$ 8,685,987.43
Total Fixed Cost	$ 134,823,491.01	$ 134,442,203.74	$ 133,822,594.32	$ 132,926,435.70	$ 131,710,432.18	$ 130,125,587.07	$ 128,116,493.33	$ 125,620,537.75	$ 122,567,008.40	$ 118,876,093.47
Variable Cost										
Direct Material	$ 587,372,237.48	$ 616,740,849.35	$ 647,577,891.82	$ 679,956,786.41	$ 713,954,625.73	$ 749,652,357.02	$ 787,134,974.87	$ 826,491,723.61	$ 867,816,309.80	$ 911,207,125.29
Indirect Materials	$ 221,242,964.50	$ 232,305,112.73	$ 243,920,368.36	$ 256,116,386.78	$ 268,922,206.12	$ 282,368,316.42	$ 296,486,732.25	$ 311,311,068.86	$ 326,876,622.30	$ 343,220,453.42
Direct Labor	$ 1,021,935.48	$ 1,021,935.48	$ 1,021,935.48	$ 1,021,935.48	$ 1,021,935.48	$ 1,021,935.48	$ 1,021,935.48	$ 1,021,935.48	$ 1,021,935.48	$ 1,021,935.48
Machine Electricity	$ 16,294,583.85	$ 1,570,587.63	$ 227,076.57	$ 49,246.32	$ 16,020.14	$ 7,817.18	$ 5,721.71	$ 6,281.91	$ 10,345.46	$ 25,556.34
Delivery	$ 108,000.00	$ 113,400.00	$ 119,070.00	$ 125,023.50	$ 131,274.68	$ 137,838.41	$ 144,730.33	$ 151,966.85	$ 159,565.19	$ 167,543.45
Income Tax	$ 104,118,555.59	$ 108,285,347.21	$ 114,665,287.66	$ 121,589,124.15	$ 128,940,935.09	$ 136,731,804.15	$ 144,989,021.42	$ 153,744,491.72	$ 163,033,427.94	$ 172,894,963.83
Value Added Tax	$ 157,742,351.15	$ 162,611,549.39	$ 170,255,329.15	$ 178,502,349.05	$ 187,189,241.70	$ 196,315,263.53	$ 205,898,755.05	$ 215,961,916.10	$ 226,528,858.33	$ 237,626,109.96
Total Variable Cost	$ 1,087,900,628.05	$ 1,122,648,781.79	$ 1,177,786,959.05	$ 1,237,360,851.69	$ 1,300,176,238.95	$ 1,366,235,332.20	$ 1,435,681,871.10	$ 1,508,689,384.54	$ 1,585,447,064.49	$ 1,666,163,687.76
Break Event Point ($)	$ 558,590,520.97	$ 558,838,255.84	$ 559,820,687.34	$ 559,712,073.21	$ 558,181,041.99	$ 554,985,545.98	$ 549,863,767.20	$ 542,519,029.15	$ 532,613,356.26	$ 519,761,710.55

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Description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Break Even Point (Unit)	$ 372.39	$ 372.56	$ 373.21	$ 373.14	$ 372.12	$ 369.99	$ 366.58	$ 361.68	$ 355.08	$ 346.51

Table 11. Payback Period Stainless Steel Plant

Year	Expenditure	Cash In		Net Cash Flow	Cumulative Net Cash Flow
		Net Profit	Depreciation		
0	$ 763,431,919.03	$ -	$ -	$ (763,431,919.03)	$ (763,431,919.03)
1	$ 26,102,117.88	$ 211,405,255.02	$ 23,569,313.41	$ 208,872,450.55	$ (554,559,468.49)
2	$ 29,234,372.02	$ 221,309,227.08	$ 23,569,313.41	$ 215,644,168.46	$ (338,915,300.03)
3	$ 32,742,496.67	$ 236,285,236.20	$ 23,569,313.41	$ 227,112,052.94	$ (111,803,247.09)
4	$ 36,671,596.27	$ 252,586,363.84	$ 23,569,313.41	$ 239,484,080.98	$ 127,680,833.89
5	$ 41,072,187.82	$ 269,964,982.69	$ 23,569,313.41	$ 252,462,108.28	$ 380,142,942.17
6	$ 46,000,850.36	$ 288,461,133.01	$ 23,569,313.41	$ 266,029,596.06	$ 646,172,538.24
7	$ 51,520,952.40	$ 308,153,229.98	$ 23,569,313.41	$ 280,201,590.99	$ 926,374,129.23
8	$ 57,703,466.69	$ 329,132,190.91	$ 23,569,313.41	$ 294,998,037.63	$ 1,221,372,166.86
9	$ 64,627,882.69	$ 351,498,749.82	$ 23,569,313.41	$ 310,440,180.53	$ 1,531,812,347.39
10	$ 72,383,228.62	$ 375,365,125.45	$ 23,569,313.41	$ 326,551,210.24	$ 1,858,363,557.63
11		$ 400,864,856.06	$ 23,569,313.41	$ 424,434,169.47	$ 2,282,797,727.10
12		$ 420,637,808.68	$ 23,569,313.41	$ 444,207,122.08	$ 2,727,004,849.18
13		$ 442,463,262.21	$ 23,569,313.41	$ 466,032,575.62	$ 3,193,037,424.80
14		$ 479,872,612.96	$ 23,569,313.41	$ 503,441,926.36	$ 3,696,479,351.16
15		$ 806,775,207.47	$ 23,569,313.41	$ 830,344,520.88	$ 4,526,823,872.05
Payback Period					**4 Years**

Table 12. Internal Rate Return and Net Present Value

Years	Cash Out	Cash In		Net Cash Flow	Discount Cash Flow	
		net profit	Depreciation		10%	20%
0	$ 763,431,919.03	$ -	$ -	$ (763,431,919.03)	$ (763,431,919.03)	$ (763,431,919.03)
1	$ 26,102,117.88	$ 211,405,255.02	$ 23,569,313.41	$ 208,872,450.55	$ 189,884,045.95	$ 174,060,375.45
2	$ 29,234,372.02	$ 221,309,227.08	$ 23,569,313.41	$ 215,644,168.46	$ 178,218,321.04	$ 149,752,894.76
3	$ 32,742,496.67	$ 236,285,236.20	$ 23,569,313.41	$ 227,112,052.94	$ 170,632,646.83	$ 131,430,586.19
4	$ 36,671,596.27	$ 252,586,363.84	$ 23,569,313.41	$ 239,484,080.98	$ 163,570,849.66	$ 115,491,937.20
5	$ 41,072,187.82	$ 269,964,982.69	$ 23,569,313.41	$ 252,462,108.28	$ 156,759,106.29	$ 101,458,859.10
6	$ 46,000,850.36	$ 288,461,133.01	$ 23,569,313.41	$ 266,029,596.06	$ 150,166,771.60	$ 89,092,773.46
7	$ 51,520,952.40	$ 308,153,229.98	$ 23,569,313.41	$ 280,201,590.99	$ 143,787,721.16	$ 78,199,121.57
8	$ 57,703,466.69	$ 329,132,190.91	$ 23,569,313.41	$ 294,998,037.63	$ 137,618,761.70	$ 68,607,115.23
9	$ 64,627,882.69	$ 351,498,749.82	$ 23,569,313.41	$ 310,440,180.53	$ 131,656,941.21	$ 60,165,386.77

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10	$ 72,383,228.62	$ 375,365,125.45	$ 23,569,313.41	$ 326,551,210.24	$ 125,899,627.76	$ 52,739,843.55
11	$ -	$ 400,864,856.06	$ 23,569,313.41	$ 424,434,169.47	$ 148,761,587.13	$ 57,123,739.95
12	$ -	$ 420,637,808.68	$ 23,569,313.41	$ 444,207,122.08	$ 141,538,078.54	$ 49,820,784.84
13	$ -	$ 442,463,262.21	$ 23,569,313.41	$ 466,032,575.62	$ 134,993,036.95	$ 43,557,212.25
14	$ -	$ 479,872,612.96	$ 23,569,313.41	$ 503,441,926.36	$ 132,571,993.94	$ 39,211,362.74
15	$ -	$ 806,775,207.47	$ 23,569,313.41	$ 830,344,520.88	$ 198,777,876.54	$ 53,893,902.65
Total					**95,633,051**	**(91,237,266)**
IRR						**15%**
MARR						**10%**
NPV						**$ 901,972,225.60**

CONCLUSION

The results of the calculation study about the strategic planning for the establishment of a new factory in the Imip Morowali region, with a production capacity of 15000 KTPA, are as follows: The intended company entity is a Limited Liability Company (LLC), and the anticipated organizational structure is a line and staff model. PT X is implementing a cash flow investment strategy to construct a new manufacturing facility. The amount of $763,431,919.03 is comprised of expenses related to the acquisition of land, research and license fees, construction expenses, land development expenditures, and the procurement of equipment and machinery for the production process. The amount is derived from 40% of investors totaling $305,372,767.6 and 60% of loans to the bank totaling $458,059,151. The cash inflow is determined by the annual income, which includes the revenue from product sales and the total cash outflow. The cash outflow is composed of operating costs, such as material costs, labor costs, electricity usage costs, purchase costs of engine components, and depreciation costs calculated using the linear method. The total amount is $23,569,313.41, with the product price being $956.01 in the first year and $1,440.16 in the tenth year. The computation employs four approaches, specifically the payment period (PP), to yield a value of 4 years. The payment time cannot exceed 10 years. Subsequently, the current net present value (NPV) is evaluated, yielding NPV1 > 0 at an interest rate of 10% with a value of $95,633,051, and NPV2 < 0 at an interest rate of 20% with a value of $91,237,266. When calculating the Internal Rate of Return (IRR), a number of 15% is more significant than the interest rate of 10%. Each of these methods yields a distinct value for the computation of the payment duration. The investment proposal is deemed suitable based on the computation of the net present value, profitability index, and internal rate of return, as they meet the corresponding eligibility conditions. The inclusion of the time value of money is crucial when calculating the return period using NPV, ROI, and IRR. This ensures that the project's long-term benefits are taken into account. Consequently, it can be inferred that the assessment of the proposal's financial viability can be deemed acceptable or appropriate.

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