

**190. PROFILE ON THE PRODUCTION OF
SPARK PLUGS**

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I. SUMMARY

This profile envisages the establishment of a plant for the production of spark plugs with a capacity of 140,000 pieces per annum. Spark plugs create sparks for combustion of the fuel and compressed air mixtures in the piston of petrol engines mounted on most automobiles.

The demand for spark plugs is met entirely through import. The present (2012) demand for spark plugs is estimated at 246,240 pieces. The demand for spark plugs is projected to reach 314,272 pieces and 401,100 pieces by the year 2017 and 2022, respectively.

The principal raw materials required are alloy steel rod, hexagonal bar: quartz, Kaolin, feldspar minerals; and enamel chemicals which have to be imported.

The total investment cost of the project including working capital is estimated at Birr 11.31 million. From the total investment cost the highest share (Birr 8.02 million or 70.97%) is accounted by fixed investment cost followed by initial working capital (Birr 1.90 million or 16.81%) and pre operation cost (Birr 1.38 million or 12.23%). From the total investment cost Birr 2.32 million or 20.51% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 35.81% and a net present value (NPV) of Birr 15.16 million discounted at 10%.

The project can create employment for 52 persons. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports. The project will also create forward linkage with the automotive subsector and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATION

Petrol engines mounted on most automobiles are fitted with spark plugs which create sparks for combustion of the fuel and compressed air mixtures in the piston. The accurate firing of the spark plug is very essential for the performance of the engine. The product thus needs to be manufactured in as much as possible to the required accuracy.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Currently there is no plant in the country that manufactures spark plugs. Thus, the demand for the product is met through import. Import of the product during the period 2002 – 2011 is shown in Table 3.1.

Table 3.1
IMPORT OF SPARK PLUGS (PIECES)

Year	Quantity
2002	186,752
2003	276,573
2004	197,639
2005	343,260
2006	190,737
2007	280,210
2008	143,894
2009	239,525
2010	275,139
2011	156,901

Source: – Ethiopian Revenue and Customs Authority

As could be seen from Table 3.1, import data of the product show a general increasing trend registering an average annual growth rate of 9.5% during the period under consideration (2002 – 2011).

For estimating the present effective demand for spark plugs, it is assumed that the average growth rate exhibited by the product's import or apparent consumption will continue at least in the near future. Accordingly, by considering the average of the recent three years (2009-2011) as

the level of consumption during 2011 and applying a growth rate of 10%, the present (2012) effective demand for spark plugs is estimated at 246,240 pieces.

2. Projected Demand

The road transport dependence for both passenger and freight traffic is increasing. The road construction being undertaken as pre-requisite for investment and development, guarantees a healthy and continuously growing auto component industry. Although the number of vehicles in the country has shown a higher growth rate in order to be conservative an annual average growth rate of 5% is used in projecting the future demand for spark plugs (see Table 3.2).

Table 3.2
PROJECTED DEMAND FOR SPARK PLUGS (PIECES)

Year	Projected Demand
2013	258,553
2014	271,480
2015	285,054
2016	299,307
2017	314,272
2018	329,986
2019	346,485
2020	363,810
2021	382,000
2022	401,100
2023	421,155
2024	442,213
2025	464,323

3. Pricing and Distribution

The retail price spark plugs range from Birr 100 to Birr 180 per pieces based on type. For the envisaged factor after considering the average retail price and allowing for distributors and

retailers margin the recommended factory gate price is Birr 103 per pieces. The product will be distributed through spare part shops.

B. PLANT CAPACITY AND PRODUCTION PROGRAMME

1. Plant Capacity

By considering the market and technological situation, a plant with a production capacity of 140,000 pieces of spark plugs per annum, on a single shift of 8 hours basis is selected.

2. Production Program

Taking into consideration the time for market penetration and the time gap for the skill acquisition, the plant starts at 75% of its installed capacity, followed by 85% at the second year. Full capacity, 100% production capacity will be attained at the third year and there after.

Table 3.3

PRODUCTION PROGRAM FOR SPARK PLUGS

	Year 1	Year 2	Year 3-10
Production (pcs)	105,000	119,000	140,000
Capacity %	75	85	100

IV. RAW MATERIALS AND INPUTS

A. RAW AND AUXILIARY MATERIALS

The production of spark plugs requires alloy steel road, hexagonal bar: quartz, Kaolin, feldspar minerals; and enamel chemicals. Most of the raw materials have to be imported. Details of raw material requirement at full capacity operation are shown in Table 4.1.

Table 4.1
RAW MATERIALS AND ANNUAL COST

No	Raw Materials	Annual Requirement (ton)	Cost (000 Birr)		
			F.C	L.C	Total
1	Alloy steel road	50	3,000	750	3,750
2	Hexagonal steel road	25	2,250	563	2,813
3	Quartz, kaolin and feldspar	15		525	525
4	Enamels/chemicals	10	500	125	625
	Total		5,750	1,963	7,713

B. UTILITIES

Utilities required are electricity and water. Annual cost of utilities at full capacity operation is Birr 101,640. The Details are given in Table 4.2.

Table 4.2
ANNUAL UTILITY REQUIREMENTS

No	Utility	Unit	Quantity	Cost (birr)
1	Electricity	Kwh	155,000	89,640
2	Water	Mt.Cube	1,200	12,000
	Total			101,640

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process Description

The main production process is assembly of metal parts with the ceramic insulator in wet stage. The components required for the formation of the ceramic insulators are crushed into fine powder, mixed with water and formed into the final shape. The central conductor is machined and threaded. The outer part of the conductor is machined and threaded. Welding of the tip of the outer part of the conductor with the tip will be done. Finally the assembly of the parts will be done.

2. Environmental Impact

The process of production involves metal and wire cutting, ceramic molding, electric heating. Hence, the plant does not have any negative impact on the environment.

B. ENGINEERING

1. Machinery and Equipment

The production activity in spark plug involves machining, threading and welding of metal parts and processing ceramic insulators for final assembly. The total cost of machinery and equipment is 3.1 million of these 2.32 million is required in foreign currency. The list of the required machinery and equipment is shown in Table 5.1.

Table 5.1

LIST OF MACHINERY AND EQUIPMENTS

No.	Type of Machine	No.
1	Planetary crusher	1
2	Concrete mixer	1
3	Pug mill	1
4	Jigs, Fixtures and moulds	3sets
5	Electric Chamber furnace 30kva	1set
5	Center lathe	2
6	Threading machine	2
7	Induction welding machine	2
8	Gas welding machine	2
9	Live Petrol Engine For test	2
10	Portable Electric Drill	5
10	Portable Angle Grinder	5
11	Pillar Drill	2
12	Pedestal Grinder	2
13	Compressor	2
14	Electrical measuring & testing set	5set

2. Land Building and Civil Work

The envisaged plant requires a total land area of 1,000 m², of which 750 m² would be built-up area. Building construction cost at a rate of Birr 5,000/m² is estimated to be Birr 3.75 million.

According to the Federal Legislation on the Lease Holding of Urban Land (Proclamation No 721/2004) in principle, urban land permit by lease is on auction or negotiation basis, however, the time and condition of applying the proclamation shall be determined by the concerned regional or city government depending on the level of development.

The legislation has also set the maximum on lease period and the payment of lease prices. The lease period ranges from 99 years for education, cultural research health, sport, NGO , religious and residential area to 80 years for industry and 70 years for trade while the lease payment period ranges from 10 years to 60 years based on the towns grade and type of investment.

Moreover, advance payment of lease based on the type of investment ranges from 5% to 10%.The lease price is payable after the grace period annually. For those that pay the entire amount of the lease will receive 0.5% discount from the total lease value and those that pay in installments will be charged interest based on the prevailing interest rate of banks. Moreover, based on the type of investment, two to seven years grace period shall also be provided.

However, the Federal Legislation on the Lease Holding of Urban Land apart from setting the maximum has conferred on regional and city governments the power to issue regulations on the exact terms based on the development level of each region.

In Addis Ababa, the City's Land Administration and Development Authority is directly responsible in dealing with matters concerning land. However, regarding the manufacturing sector, industrial zone preparation is one of the strategic intervention measures adopted by the City Administration for the promotion of the sector and all manufacturing projects are assumed to be located in the developed industrial zones.

Regarding land allocation of industrial zones if the land requirement of the project is below 5,000 m², the land lease request is evaluated and decided upon by the Industrial Zone Development and Coordination Committee of the City's Investment Authority. However, if the land request is above 5,000 m², the request is evaluated by the City's Investment Authority and passed with recommendation to the Land Development and Administration Authority for decision, while the lease price is the same for both cases.

Moreover, the Addis Ababa City Administration has recently adopted a new land lease floor price for plots in the city. The new prices will be used as a benchmark for plots that are going to be auctioned by the city government or transferred under the new "Urban Lands Lease Holding Proclamation."

The new regulation classified the city into three zones. The first Zone is Central Market District Zone, which is classified in five levels and the floor land lease price ranges from Birr 1,686 to Birr 894 per m². The rate for Central Market District Zone will be applicable in most areas of the city that are considered to be main business areas that entertain high level of business activities.

The second zone, Transitional Zone, will also have five levels and the floor land lease price ranges from Birr 1,035 to Birr 555 per m². This zone includes places that are surrounding the city and are occupied by mainly residential units and industries.

The last and the third zone, Expansion Zone, is classified into four levels and covers areas that are considered to be in the outskirts of the city, where the city is expected to expand in the future. The floor land lease price in the Expansion Zone ranges from Birr 355 to Birr 191 per m² (see Table 5.2).

Table 5.2**NEW LAND LEASE FLOOR PRICE FOR PLOTS IN ADDIS ABABA**

Zone	Level	Floor price/m²
Central Market District	1 st	1686
	2 nd	1535
	3 rd	1323
	4 th	1085
	5 th	894
Transitional zone	1 st	1035
	2 nd	935
	3 rd	809
	4 th	685
	5 th	555
Expansion zone	1 st	355
	2 nd	299
	3 rd	217
	4 th	191

Accordingly, in order to estimate the land lease cost of the project profiles it is assumed that all new manufacturing projects will be located in industrial zones located in expansion zones. Therefore, for the profile a land lease rate of Birr 266 per m², which is equivalent to the average floor price of plots located in expansion zone, is adopted.

On the other hand, some of the investment incentives arranged by the Addis Ababa City Administration on lease payment for industrial projects are granting longer grace period and extending the lease payment period. The criteria are creation of job opportunity, foreign exchange saving, investment capital and land utilization tendency etc. Accordingly, Table 5.3 shows incentives for lease payment.

Table 5.3**INCENTIVES FOR LEASE PAYMENT OF INDUSTRIAL PROJECTS**

Scored point	Grace period	Payment Completion Period	Down Payment
Above 75%	5 Years	30 Years	10%
From 50 - 75%	5 Years	28 Years	10%
From 25 - 49%	4 Years	25 Years	10%

For the purpose of this project profile the average i.e. five years grace period, 28 years payment completion period and 10% down payment is used. The land lease period for industry is 60 years.

Accordingly, the total land lease cost at a rate of Birr 266 per m² is estimated at Birr 266,000 of which 10% or Birr 26,600 will be paid in advance. The remaining Birr 239,400 will be paid in equal installments with in 28 years i.e. Birr 8,550 annually.

VI. HUMAN RESOURCE AND TRAINING REQUIREMENT**A. HUMAN RESOURCE REQUIREMENT**

The plant requires a total of 52 workers of whom 15 are administrative and 37 are technical workers. The salary and benefit is Birr 734,130. The detail is indicated on Table 6.1 below.

B. TRAINING REQUIREMENT

The main jobs to be done in the Factory are assembly works which are not complicated to follow. Thus, short time on the job demonstration will enable the workers to be productive on the job. This costs an amount of Birr 25,000.

Table 6.1
HUMAN RESOURCE REQUIREMENT AND COST

No	Type of Job	No	Monthly Salary (Birr)	Annual Salary (Birr)
1	Manager	1	5,000	60,000
2	Quality Control	1	4,000	48,000
3	Foreman	1	3,500	42000
4	Technician	7	2,000	168,000
5	Technician /Helper	2	2,000	48,000
6	Administrator /D/Manager	1	4,000	48,000
7	Cashier	1	2,000	24,000
8	Secretary	1	2,500	30,000
9	Accountant	1	2,500	30,000
10	Purchaser/ Sales Man	1	2,500	30,000
11	Laborer	5	800	48,000
12	Guards	4	800	38,400
13	Cleaner	3	800	28,800
	Total	29	51,100	613,200
	Annual Benefits			120,930
	Grand Total			734,130

VII. FINANCIAL ANALYSIS

The financial analysis of the spark plugs project is based on the data presented in the previous chapters and the following assumptions:-

Construction period	1 year
Source of finance	30 % equity & 70 loan
Tax holidays	3 years

Bank interest	10%
Discount cash flow	10%
Accounts receivable	30 days
Raw material local	30 days
Raw material imported	120 days
Work in progress	1 day
Finished products	30 days
Cash in hand	5 days
Accounts payable	30 days
Repair and maintenance	5% of machinery cost

A. TOTAL INITIAL INVESTMENT COST

The total investment cost of the project including working capital is estimated at Birr 11.31 million (See Table 7.1). From the total investment cost the highest share (Birr 8.02 million or 70.97%) is accounted by fixed investment cost followed by initial working capital (Birr 1.90 million or 16.81%) and pre operation cost (Birr 1.38 million or 12.23%). From the total investment cost Birr 2.32 million or 20.51% is required in foreign currency.

Table 7.1**INITIAL INVESTMENT COST ('000 Birr)**

Sr. No	Cost Items	Local Cost	Foreign Cost	Total Cost	% Share
1	Fixed investment				
1.1	Land Lease	26.60		26.60	0.24
1.2	Building and civil work	3,750.00		3,750.00	33.16
1.3	Machinery and equipment	780.00	2,320.00	3,100.00	27.41
1.4	Vehicles	900.00		900.00	7.96
1.5	Office furniture and equipment	250.00		250.00	2.21
	Sub total	5,706.60	2,320.00	8,026.60	70.97
2	Pre operating cost *				
2.1	Pre operating cost	643.00		643.00	5.69
2.2	Interest during construction	739.93		739.93	6.54
	Sub total	1,382.93		1,382.93	12.23
3	Working capital **	1,900.87		1,900.87	16.81
	Grand Total	8,990.40	2,320.00	11,310.40	100

* *N.B Pre operating cost include project implementation cost such as installation, startup, commissioning, project engineering, project management etc and capitalized interest during construction.*

** *The total working capital required at full capacity operation is Birr 2.68 million. However, only the initial working capital of Birr 1.90 million during the first year of production is assumed to be funded through external sources. During the remaining years the working capital requirement will be financed by funds to be generated internally (for detail working capital requirement see Appendix 7.A.1).*

B. PRODUCTION COST

The annual production cost at full operation capacity is estimated at Birr 11.41 million (see Table 7.2). The cost of raw material account for 67.55% of the production cost. The other major components of the production cost are depreciation, financial cost, direct labour, and cost of marketing and distribution which account for 9.67%, 5.35%, 5.37%, and 6.57% respectively. The remaining 5.50% is the share of utility, repair and maintenance, labour overhead and administration cost. For detail production cost see Appendix 7.A.2.

Table 7.2**ANNUAL PRODUCTION COST AT FULL CAPACITY (year three)**

Items	Cost (000 Birr)	%
Raw Material and Inputs	7,713.00	67.55
Utilities	102.00	0.89
Maintenance and repair	155.00	1.36
Labour direct	613.00	5.37
Labour overheads	121.00	1.06
Administration Costs	250.00	2.19
Land lease cost	-	-
Cost of marketing and distribution	750.00	6.57
Total Operating Costs	9,704.00	84.99
Depreciation	1,103.60	9.67
Cost of Finance	610.44	5.35
Total Production Cost	11,418.04	100

C. FINANCIAL EVALUATION**1. Profitability**

Based on the projected profit and loss statement, the project will generate a profit through out its operation life. Annual net profit after tax will grow from Birr 1.97 million to Birr 3.17 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 31.50 million. For profit and loss statement and cash flow projection see Appendix 7.A.3 and 7.A.4 respectively.

2. Ratios

In financial analysis financial ratios and efficiency ratios are used as an index or yardstick for evaluating the financial position of a firm. It is also an indicator for the strength and weakness of the firm or a project. Using the year-end balance sheet figures and other relevant data, the most important ratios such as return on sales which is computed by dividing net income by revenue, return on assets (operating income divided by assets), return on equity (net profit divided by equity) and return on total investment (net profit plus interest divided by total investment) has been carried out over the period of the project life and all the results are found to be satisfactory.

3. Break-even Analysis

The break-even analysis establishes a relationship between operation costs and revenues. It indicates the level at which costs and revenue are in equilibrium. To this end, the break-even point for capacity utilization and sales value estimated by using income statement projection are computed as followed.

$$\text{Break Even Sales Value} = \frac{\text{Fixed Cost} + \text{Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 4,890,031$$

$$\text{Break Even Capacity utilization} = \frac{\text{Break even Sales Value}}{\text{Sales revenue}} \times 100 = 34\%$$

4. Pay-back Period

The pay-back period, also called pay – off period is defined as the period required for recovering the original investment outlay through the accumulated net cash flows earned by the project. Accordingly, based on the projected cash flow it is estimated that the project’s initial investment will be fully recovered within 3 years.

5. Internal Rate of Return

The internal rate of return (IRR) is the annualized effective compounded return rate that can be earned on the invested capital, i.e., the yield on the investment. Put another way, the internal rate of return for an investment is the discount rate that makes the net present value of the investment's income stream total to zero. It is an indicator of the efficiency or quality of an investment. A project is a good investment proposition if its IRR is greater than the rate of return that could be earned by alternate investments or putting the money in a bank account. Accordingly, the IRR of this project is computed to be 35.81% indicating the viability of the project.

6. Net Present Value

Net present value (NPV) is defined as the total present (discounted) value of a time series of cash flows. NPV aggregates cash flows that occur during different periods of time during the life of a project in to a common measuring unit i.e. present value. It is a standard method for using the time value of money to appraise long-term projects. NPV is an indicator of how much value an investment or project adds to the capital invested. In principal a project is accepted if the NPV is non-negative.

Accordingly, the net present value of the project at 10% discount rate is found to be Birr 15.16 million which is acceptable. For detail discounted cash flow see Appendix 7.A.5.

D. ECONOMIC AND SOCIAL BENEFITS

The project can create employment for 52 persons. The project will generate Birr 8.32 million in terms of tax revenue. The establishment of such factory will have a foreign exchange saving effect to the country by substituting the current imports. The project will also create forward linkage with the automotive subsector generate other income for the government.

Appendix 7.A

FINANCIAL ANALYSES SUPPORTING TABLES

Appendix 7.A.2
PRODUCTION COST (in 000 Birr)

Item	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Raw Material and Inputs	5,399	6,170	6,942	7,713	7,713	7,713	7,713	7,713	7,713	7,713
Utilities	71	82	92	102	102	102	102	102	102	102
Maintenance and repair	109	124	140	155	155	155	155	155	155	155
Labour direct	429	490	552	613	613	613	613	613	613	613
Labour overheads	85	97	109	121	121	121	121	121	121	121
Administration Costs	175	200	225	250	250	250	250	250	250	250
Land lease cost	0	0	0	0	9	9	9	9	9	9
Cost of marketing and distribution	750	750	750	750	750	750	750	750	750	750
Total Operating Costs	7,018	7,913	8,809	9,704	9,713	9,713	9,713	9,713	9,713	9,713
Depreciation	1,104	1,104	1,104	1,104	1,104	175	175	175	175	175
Cost of Finance	0	814	712	610	509	407	305	203	102	0
Total Production Cost	8,121	9,831	10,624	11,418	11,325	10,295	10,193	10,091	9,989	9,888

Appendix 7.A.3
INCOME STATEMENT (in 000 Birr)

Item	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Sales revenue	10,094	12,978	14,420	14,420	14,420	14,420	14,420	14,420	14,420	14,420
Less variable costs	6,268	7,163	8,059	8,954	8,954	8,954	8,954	8,954	8,954	8,954
VARIABLE MARGIN	3,826	5,815	6,361	5,466	5,466	5,466	5,466	5,466	5,466	5,466
in % of sales revenue	37.91	44.81	44.12	37.91	37.91	37.91	37.91	37.91	37.91	37.91
Less fixed costs	1,854	1,854	1,854	1,854	1,862	934	934	934	934	934
OPERATIONAL MARGIN	1,973	3,961	4,508	3,612	3,604	4,532	4,532	4,532	4,532	4,532
in % of sales revenue	19.54	30.52	31.26	25.05	24.99	31.43	31.43	31.43	31.43	31.43
Financial costs		814	712	610	509	407	305	203	102	0
GROSS PROFIT	1,973	3,147	3,796	3,002	3,095	4,125	4,227	4,329	4,431	4,532
in % of sales revenue	19.54	24.25	26.32	20.82	21.46	28.61	29.32	30.02	30.73	31.43
Income (corporate) tax	0	0	0	901	929	1,238	1,268	1,299	1,329	1,360
NET PROFIT	1,973	3,147	3,796	2,101	2,167	2,888	2,959	3,030	3,101	3,173
in % of sales revenue	19.54	24.25	26.32	14.57	15.02	20.03	20.52	21.01	21.51	22.00

Appendix 7.A.4**CASH FLOW FOR FINANCIAL MANAGEMENT (in 000 Birr)**

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Scrap
TOTAL CASH INFLOW	8,670	12,780	12,984	14,426	14,420	14,420	14,420	14,420	14,420	14,420	14,420	5,706
Inflow funds	8,670	2,686	6	6	0	0	0	0	0	0	0	0
Inflow operation	0	10,094	12,978	14,420	14,420	14,420	14,420	14,420	14,420	14,420	14,420	0
Other income	0	0	0	0	0	0	0	0	0	0	0	5,706
TOTAL CASH OUTFLOW	8,670	9,703	10,014	10,807	12,501	12,168	12,375	12,303	12,232	12,161	11,072	0
Increase in fixed assets	8,670	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	1,946	269	269	269	1	0	0	0	0	0	0
Operating costs	0	6,268	7,163	8,059	8,954	8,963	8,963	8,963	8,963	8,963	8,963	0
Marketing and Distribution cost	0	750	750	750	750	750	750	750	750	750	750	0
Income tax	0	0	0	0	901	929	1,238	1,268	1,299	1,329	1,360	0
Financial costs	0	740	814	712	610	509	407	305	203	102	0	0
Loan repayment	0	0	1,017	1,017	1,017	1,017	1,017	1,017	1,017	1,017	0	0
SURPLUS (DEFICIT)	0	3,076	2,971	3,619	1,919	2,252	2,045	2,117	2,188	2,259	3,348	5,706
CUMULATIVE CASH BALANCE	0	3,076	6,047	9,666	11,585	13,837	15,882	17,999	20,187	22,446	25,793	31,500

Appendix 7.A.5
DISCOUNTED CASH FLOW (in 000 Birr)

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Scrap
TOTAL CASH INFLOW	0	10,094	12,978	14,420	14,420	14,420	14,420	14,420	14,420	14,420	14,420	5,706
Inflow operation	0	10,094	12,978	14,420	14,420	14,420	14,420	14,420	14,420	14,420	14,420	0
Other income	0	0	0	0	0	0	0	0	0	0	0	5,706
TOTAL CASH OUTFLOW	10,570	7,280	8,176	9,071	10,605	10,641	10,950	10,981	11,011	11,042	11,072	0
Increase in fixed assets	8,670	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	1,901	263	263	263	1	0	0	0	0	0	0	0
Operating costs	0	6,268	7,163	8,059	8,954	8,963	8,963	8,963	8,963	8,963	8,963	0
Marketing and Distribution cost	0	750	750	750	750	750	750	750	750	750	750	0
Income (corporate) tax		0	0	0	901	929	1,238	1,268	1,299	1,329	1,360	0
NET CASH FLOW	-10,570	2,814	4,802	5,349	3,815	3,779	3,470	3,439	3,409	3,378	3,348	5,706
CUMULATIVE NET CASH FLOW	-10,570	-7,757	-2,955	2,394	6,209	9,988	13,457	16,897	20,305	23,684	27,031	32,737
Net present value	-10,570	2,558	3,969	4,019	2,605	2,346	1,959	1,765	1,590	1,433	1,291	2,200
Cumulative net present value	-10,570	-8,013	-4,044	-25	2,580	4,926	6,885	8,650	10,240	11,673	12,964	15,164

NET PRESENT VALUE 15,164
INTERNAL RATE OF RETURN 35.81%
NORMAL PAYBACK 3 years