

**152. PROFILE ON THE PRODUCTION OF
ALUMINIUM FRAMES**

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I. SUMMARY

This profile envisages the establishment of a plant for the production of aluminum frames with a capacity of 2,500 tons per annum. Aluminum frames are used on many high rise buildings and small residential luxurious villas for glass window and door frames and wall partitions.

The demand for aluminum frames is met through both local production and import. The present (2012) demand for aluminum frames is estimated at 4,612 tons. The demand for aluminum frames is projected to reach 9,276 tons and 18,657 tons by the year 2017 and 2022, respectively.

The principal raw materials required are aluminum alloy bars and aluminum scrap. Aluminum scrap is available locally whereas aluminum alloy bars has to be imported.

The total investment cost of the project including working capital is estimated at Birr 54.10 million. From the total investment cost the highest share (Birr 26.89 million or 49.70%) is accounted by initial working capital followed by fixed investment cost (Birr 22.54 million or 41.66%) and pre operation cost (Birr 4.67 million or 8.64%). From the total investment cost Birr 12.53 million or 23.16% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 33.90% and a net present value (NPV) of Birr 71.20 million discounted at 10%.

The project can create employment for 15 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 backward ward linkage with and the recycled waste (aluminum scrap) sub sector and forward linkage with the construction sub sector and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATIONS

The profile consists of three different kinds of sections known as L; T; Z Sections. Aluminum frame is assembled from the sections selected appropriately and fixed together to form the required sections. Along with aluminum frames water proof and soft rubber filers are installed to support the glass sheets on the aluminum frame.

Aluminum frames are now a days being used on many high rise buildings and small residential luxuries villas for glass window and door frames and wall partitions .The profile consists of three different kinds of sections known as L; T; Z Sections. Aluminum frame are assembled from the sections selected appropriately and fixed together to form the required sections. Along with aluminum frames water proof and soft rubber filers are installed to support the glass sheets on the aluminum frame.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

The country's requirement of aluminum frames and profiles is met through both local production and imports. Accordingly, the trend in the local production and import of the product is discussed hereunder.

The data source for locally manufactured products i.e. Central Statistical Agency's "Report on large and medium scale manufacturing and electricity industries survey" does not show the local production volume of aluminum frames and profiles separately. Therefore, in order to estimate the trend in the local production of aluminum frames and profiles an indirect approach i.e. based on raw material import is employed.

Aluminum frames and profiles are locally produced in workshops from imported bars, rods and profiles of aluminum. During the period 2002 – 2011, the country's import of bars, rods and profiles of aluminum has increased from 341 tons to 3,104 tons, registering an average annual growth rate of 47.3% (see Table 3.1).

Table 3.1**IMPORT OF BARS, RODS AND PROFILES OF ALUMINUM (TONS)**

Year	Import
2002	341
2003	158
2004	600
2005	987
2006	1,490
2007	1,577
2008	1,652
2009	2,473
2010	2,723
2011	3,104

Source: - *Ethiopian Revenue and Customs Authority.*

According to knowledgeable persons 70% of the imported bars, rods and profiles of aluminum are used to produce aluminum frames and profiles. Accordingly, assuming 5% wastage during production the estimated local production of aluminum frames and profiles is shown in Table 3.2.

Table 3.2**ESTIMATED LOCAL PRODUCTION OF ALUMINUM FRAMES AND PROFILES (IN TONS)**

Year	Local Production
2002	227
2003	105
2004	399
2005	656
2006	991
2007	1,049
2008	1,099
2009	1,645
2010	1,811
2011	2,064

As can be seen from the above Table, the estimated local production of aluminum frames and profiles has increased from 227 tons in 2002 to 2,064 tons in 2011. However, on average local production of aluminum frames and profiles was 1,004 tons.

Import of aluminum frames and profiles is also a major source of the products supply. The country imports the products from different countries. The quantity of the products annually imported to during the period 2002– 2011 is shown in Table 3.3.

Table 3.3

IMPORT OF ALUMINUM FRAMES AND PROFILES (TONS)

Year	Import
2002	198
2003	525
2004	534
2005	1,150
2006	1,011
2007	1,016
2008	1,005
2009	463
2010	2,036
2011	1,844

Source: Ethiopian Revenues & Customs Authority.

As can be seen from Table 3.3, import of aluminum frame and profile shows a substantial fluctuation from year to year ranging from 463 tons in year 2009 to 2,036 tons in 2010.

The total supply or apparent consumption of aluminum frames and profiles which comprise local production and import is summarized in Table 3.4.

Table 3.4**TOTAL SUPPLY OF ALUMINUM FRAMES AND PROFILES (IN TONS)**

Year	Local Production	Import	Total Supply
2002	227	198	425
2003	105	525	630
2004	399	534	933
2005	656	1,150	1,806
2006	991	1,011	2,002
2007	1,049	1,016	2,065
2008	1,099	1,005	2,104
2009	1,645	463	2,108
2010	1,811	2,036	3,847
2011	2,064	1,844	3,908

As can be seen from the above Table, the total supply or apparent consumption of aluminum frames and profiles during the period 2002 – 2011 exhibits a consistent year to year growth increasing from 425 tons to 3,908 tons.

Considering the nature of the trend in the apparent consumption of aluminum frames and profiles, it is assumed that the growth rate registered in the recent five years (2007-2011) will also continue in the near future. Accordingly, taking the apparent consumption for year 2011 as a base and applying a growth rate of 16% the present effective demand (2012) for aluminum frames and profiles is estimated at 4,612 tons.

2. Projected Demand

The demand for aluminum frames and profiles depends mainly on the performance of its end-user (i.e. the construction sector or more specifically the building construction sector). Therefore, the demand for the products under consideration is a derived demand, which depends directly on the performance of its major end user.

The construction sector of the country has undergone tremendous changes and development in recent years. The contribution of the construction sector to the GDP during the period 2001 – 2010 have been growing at annual average growth rate of 13 percent which is above the average annual growth rate of real GDP during the period under consideration (11.4 %), indicating a rise in the share of the construction sector within the overall economy. Moreover, during the GTP period (2010 – 2015), the construction sector is expected to grow at annual average growth rate of 20%.

On the other hand among the factors that influence the demand for aluminum frames and profiles one of the critical factor is identified to be economic growth leading to growth of the construction sector. According to the government's "Growth and Transformation Plan" during the period 2010 – 2015 the GDP of the country is expected to grow at a minimum average annual growth rate of 11.2%.

Accordingly, based on the above discussion a growth rate of 15% which is slightly higher than the expected growth rate of the country's GDP during the GTP period (2011 – 2015) is used. Moreover, it is assumed that the highest local production during 2002 – 2011 indicates the current local production capacity of aluminum frames and profiles.

Based on the above assumption and using the estimated present demand as a base the projected demand for aluminum frames and profiles and demand supply gap is shown in Table 3.5.

Table 3.5

**PROJECTED DEMAND FOR ALUMINUM FRAMES AND PROFILES AND DEMAND
SUPPLY GAP (TONS)**

Year	Projected Demand	Existing Capacity	Demand Supply Gap
2013	5,303	2,000	3,303
2014	6,099	2,000	4,099
2015	7,014	2,000	5,014
2016	8,066	2,000	6,066
2017	9,276	2,000	7,276
2018	10,667	2,000	8,667
2019	12,267	2,000	10,267
2020	14,107	2,000	12,107
2021	16,223	2,000	14,223
2022	18,657	2,000	16,657
2023	21,455	2,000	19,455
2024	24,673	2,000	22,673
2025	28,374	2,000	26,374

3. Pricing and Distribution

The current retail price of aluminum profiles (L, T, and Z) is Birr 92/kg. Considering wholesalers and retailers margin of 30% the recommended factory gate price for the envisaged factory is Birr 70.76/kg.

Considering the nature of the products and the characteristics of the end users a combination both direct distribution to end users (for bulk purchasers) and indirect distribution (using agents) is selected as the most appropriate distribution channel.

B. PLANT CAPACITY AND PRODUCTION PROGRAM

1. Plant Capacity

The market study for the project indicates unsatisfied yearly demand of about 3,300 tons of aluminum frames and profiles in the year 2013. The production capacity of the plant is selected as 2,500 tons of aluminum frames to meet the market with an economical production quantity.

2. Production Program

By considering the time required for skill development and market penetration the plant is assumed to operate at 75% of installed capacity during the first year of production. In the second year and third year and then after it will increase to 85% and 100% respectively (see Table 3.6).

Table 3.6
ANNUAL PRODUCTION PROGRAM

Product	Year1	Year 2	Year 3
Aluminum profiles (Tons)	1,875	2,125	2,500
Capacity %	75	85	100

IV. RAW MATERIAL AND INPUTS

A. RAW AND AUXILIARY MATERIALS

The production of aluminum profile requires aluminum ingots either from scraps sources or in the form of bars from import or from local sources. The total requirement of raw materials at full capacity production is indicated on Table 4.1.

Table 4.1
RAW MATERIALS REQUIREMENT AND COST

No	Type of Raw Materials	Quantity (Tons)	Unit Cost (,000)		Total (`000 Birr)
			F.C (Birr /ton)	L.C (Birr /ton)	
1	Aluminum Alloy Bars	2,400	46	----	110,400
2	Aluminum Scrap	150	---	30	4,500
3	Fuel oil	1,000	10/lit	----	10
	Total				114,910

B. UTILITIES

The major utilities required for the plant are electricity and water. Annual cost of utilities at full capacity operation is estimated at Birr 85,080 as shown in Table 4.2.

Table 4.2
ANNUAL UTILITY REQUIREMENTS AND COSTS

No	Utility	Unit	Quantity	Cost	
				Unit (Birr)	Total (Birr)
1	Electricity	kWh	122,000	0.58	70,080
2	Water	m ³	1,500	10.00	15,000
3	Total				85,080

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process Description

The scrap aluminum or the ingot is melted in the furnace. The melted metal is injected by pressure to form a long piece of the profiles. The extruded section is cut into pieces of proper standard size.

2. Environmental Impact

The process has effluents which can have moderate effect on the environment. This effect could be minimized by using efficient, well serviced smoke chimney and burner. The investment cost of the effluent treatment unit is included in the cost of machinery and equipment.

B. ENGINEERING

1. Machinery and Equipment

Total cost of machinery and equipment is estimated at Birr 15.66 million of which Birr 12.53 million is required in foreign currency. The list of machinery and equipment with their corresponding costs are shown in Table 5.1.

Table 5.1
LIST OF MACHINERY & EQUIPMENT AND COST

No	Name of Machine	Qty	Unit Cost (‘000 Birr)	Total cost (‘000 Birr)
1	Extrusion die casting press	1	15,000	15,000
2	Shearing Machine	1	290	290
3	Circular Saw	2	50	100
4	Oil furnace	1	25	25
5	Hand tools	1set	10	10
6	Material Handling equipment	1 set	10	10
7	Gas Welding Set	2 set	15	30
8	Effluent treatment unit	1 set	200	200
	Total			15,665

2. Land, Building and Civil Works

Taking into account reserve area for future expansion, accommodation of vehicles and trucks, and space for gardening, the total site area required is estimated to be 1,800 m². The total built-up area of the plant comprised of main factory building, warehouses, offices, and cafeteria and guard houses. The total building area covers an area of 1,000 square meters. The estimated construction cost is Birr 5 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 within 28 years i.e. Birr 8,550 annually.

VI. HUMAN RESOURCE AND TRAINING REQUIREMENT

A. HUMAN RESOURCE REQUIREMENT

The plant requires a total of 15 workers. Table 6.1 Annual cost of labor is estimated at Birr 431,025. The details of human resource requirement by type of job and monthly and annual salary are shown in Table 6.1.

B. TRAINING REQUIREMENTS

On-the-job training and demonstration of the operation of the machine would be enough for workers with technical background. For such few days training Birr 10,000 would be required.

Table 6.1
HUMAN RESOURCE REQUIREMENTS AND LABOR COST

No.	Job Title	No .of Persons	Monthly Salary (Birr)	Annual Salary (Birr)
1	Manager	1	5,000	60,000
2	Chief foreman	1	3,500	42,000
3	Operator Technicians	4	2,500	120,000
4	Maintenance Technicians	2	2,000	48,000
5	Laborer	2	800	19,200
6	A/Manager/administrator	1	4,000	48,000
7	Accountant	1	2,500	30,000
8	Cashier	1	2,000	24,000
9	Sales/ purchase	1	2,500	30,000
10	Secretary	1	2,500	30,000
	Sub-Total			346,200
	Benefits			84,825
	Total	15		431,025

VII. FINANCIAL ANALYSIS

The financial analysis of the aluminum frames and profiles 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	5 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 54.10 million (see Table 7.1). From the total investment cost the highest share (Birr 26.89 million or 49.70%) is accounted by initial working capital followed by fixed investment cost (Birr 22.54 million or 41.66%) and pre operation cost (Birr 4.67 million or 8.64%). From the total investment cost Birr 12.53 million or 23.16% 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	0.05
1.2	Building and civil work	5,000.00		5,000.00	9.24
1.3	Machinery and equipment	3,133.00	12,532.00	15,665.00	28.95
1.4	Vehicles	1,500.00		1,500.00	2.77
1.5	Office furniture and equipment	350.00		350.00	0.65
	Sub total	10,009.60	12,532.00	22,541.60	41.66
2	Pre operating cost *				
2.1	Pre operating cost	1,133.25		1,133.25	2.09
2.2	Interest during construction	3,539.73		3,539.73	6.54
	Sub total	4,672.98		4,672.98	8.64
3	Working capital **	26,892.73		26,892.73	49.70
	Grand Total	41,575.31	12,532.00	54,107.31	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 38.40 million. However, only the initial working capital of Birr 26.89 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 123.77 million (see Table 7.2). The cost of raw material account for 92.84% of the production cost. The other major components of the production cost are depreciation, financial cost and repair and maintenance, which account for 3.15%, 2.36% and 0.63% respectively. The remaining 1.02% is the share of utility, labor, labor overhead, cost of marketing and distribution 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	%
Raw Material and Inputs	114,910.00	92.84
Utilities	85.00	0.07
Maintenance and repair	783.00	0.63
Labour direct	346.00	0.28
Labour overheads	85.00	0.07
Administration Costs	250.00	0.20
Land lease cost	-	-
Cost of marketing and distribution	500.00	0.40
Total Operating Costs	116,959.00	94.49
Depreciation	3,894.65	3.15
Cost of Finance	2,920.28	2.36
Total Production Cost	123,773.93	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 9.02 thousand to Birr 12.89 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 153.05 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.

$$\text{Break Even Sales Value} = \frac{\text{Fixed Cost} + \text{Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 31,098,007$$

$$\text{Break Even Capacity utilization} = \frac{\text{Break even Sales Value}}{\text{Sales revenue}} \times 100 = 23\%$$

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 33.90% 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 principle, 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 71.20 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 15 persons. The project will generate Birr 26.17 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 backward linkage with and the recycled waste (aluminum scrap) sub sector and forward linkage with the construction sub sector and also generates 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	80,437	91,928	103,419	114,910	114,910	114,910	114,910	114,910	114,910	114,910
Utilities	60	68	77	85	85	85	85	85	85	85
Maintenance and repair	548	626	705	783	783	783	783	783	783	783
Labour direct	242	277	311	346	346	346	346	346	346	346
Labour overheads	60	68	77	85	85	85	85	85	85	85
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	500	500	500	500	500	500	500	500	500	500
Total Operating Costs	82,021	93,667	105,313	116,959	116,968	116,968	116,968	116,968	116,968	116,968
Depreciation	3,895	3,895	3,895	3,895	3,895	235	235	235	235	235
Cost of Finance	0	3,894	3,407	2,920	2,434	1,947	1,460	973	487	0
Total Production Cost	85,916	101,456	112,615	123,774	123,296	119,149	118,663	118,176	117,689	117,203

Appendix 7.A.3
NET 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	94,93 8	122,06 3	135,62 5	135,62 5	135,62 5	135,62 5	135,62 5	135,62 5	135,62 5	135,62 5
Less variable costs	81,52 1	93,167	104,81 3	116,45 9	116,45 9	116,45 9	116,45 9	116,45 9	116,45 9	116,45 9
VARIABLE MARGIN	13,41 6	28,895	30,812	19,166	19,166	19,166	19,166	19,166	19,166	19,166
in % of sales revenue	14.13	23.67	22.72	14.13	14.13	14.13	14.13	14.13	14.13	14.13
Less fixed costs	4,395	4,395	4,395	4,395	4,403	744	744	744	744	744
OPERATIONAL MARGIN	9,022	24,501	26,417	14,771	14,763	18,422	18,422	18,422	18,422	18,422
in % of sales revenue	9.50	20.07	19.48	10.89	10.89	13.58	13.58	13.58	13.58	13.58
Financial costs		3,894	3,407	2,920	2,434	1,947	1,460	973	487	0
GROSS PROFIT	9,022	20,607	23,010	11,851	12,329	16,476	16,962	17,449	17,936	18,422
in % of sales revenue	9.50	16.88	16.97	8.74	9.09	12.15	12.51	12.87	13.22	13.58
Income (corporate) tax	0	0	0	0	0	4,943	5,089	5,235	5,381	5,527
NET PROFIT	9,022	20,607	23,010	11,851	12,329	11,533	11,874	12,214	12,555	12,896
in % of sales revenue	9.50	16.88	16.97	8.74	9.09	8.50	8.75	9.01	9.26	9.51

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	23,675	125,436	122,072	135,634	135,625	135,625	135,625	135,625	135,625	135,625	135,625	44,967
Inflow funds	23,675	30,498	9	9	0	0	0	0	0	0	0	0
Inflow operation	0	94,938	122,063	135,625	135,625	135,625	135,625	135,625	135,625	135,625	135,625	0
Other income	0	0	0	0	0	0	0	0	0	0	0	44,967
TOTAL CASH OUTFLOW	23,675	112,520	106,273	117,432	128,592	124,269	128,724	128,384	128,043	127,702	122,494	0
Increase in fixed assets	23,675	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	26,959	3,845	3,845	3,845	1	0	0	0	0	0	0
Operating costs	0	81,521	93,167	104,813	116,459	116,468	116,468	116,468	116,468	116,468	116,468	0
Marketing and Distribution cost	0	500	500	500	500	500	500	500	500	500	500	0
Income tax	0	0	0	0	0	0	4,943	5,089	5,235	5,381	5,527	0
Financial costs	0	3,540	3,894	3,407	2,920	2,434	1,947	1,460	973	487	0	0
Loan repayment	0	0	4,867	4,867	4,867	4,867	4,867	4,867	4,867	4,867	0	0
SURPLUS (DEFICIT)	0	12,916	15,799	18,202	7,033	11,356	6,901	7,241	7,582	7,923	13,131	44,967
CUMULATIVE CASH BALANCE	0	12,916	28,715	46,917	53,950	65,306	72,207	79,448	87,030	94,953	108,084	153,052

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	94,938	122,063	135,625	135,625	135,625	135,625	135,625	135,625	135,625	135,625	44,967
Inflow operation	0	94,938	122,063	135,625	135,625	135,625	135,625	135,625	135,625	135,625	135,625	0
Other income	0	0	0	0	0	0	0	0	0	0	0	44,967
TOTAL CASH OUTFLOW	50,568	85,857	97,503	109,149	116,960	116,968	121,910	122,056	122,202	122,348	122,494	0
Increase in fixed assets	23,675	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	26,893	3,836	3,836	3,836	1	0	0	0	0	0	0	0
Operating costs	0	81,521	93,167	104,813	116,459	116,468	116,468	116,468	116,468	116,468	116,468	0
Marketing and Distribution cost	0	500	500	500	500	500	500	500	500	500	500	0
Income (corporate) tax		0	0	0	0	0	4,943	5,089	5,235	5,381	5,527	0
NET CASH FLOW	-50,568	9,080	24,559	26,476	18,665	18,657	13,715	13,569	13,423	13,277	13,131	44,967
CUMULATIVE NET CASH FLOW	-50,568	41,487	-16,928	9,548	28,213	46,871	60,586	74,154	87,577	100,854	113,985	158,952
Net present value	-50,568	8,255	20,297	19,892	12,749	11,585	7,742	6,963	6,262	5,631	5,062	17,337
Cumulative net present value	-50,568	42,313	-22,016	-2,124	10,625	22,210	29,951	36,914	43,176	48,806	53,869	71,206

NET PRESENT VALUE 71,206
INTERNAL RATE OF RETURN 33.90%
NORMAL PAYBACK 3 years