170. PROFILE ON THE PRODUCTION OF FLUORESCENT FIXTURES & LAMP HOLDERS

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I. SUMMARY

This profile envisages the establishment of a plant for the production of 200 tons of florescent fixtures and 60 tons of lamp holders per annum. Fluorescent fixtures are devices that are used to hold florescent tubes in place and in contact with the various electrical devices so that the tubes emit the proper desired light and lamp holders are devices that are used to hold lamps suspended on the ceiling or on walls, tables etc. to illuminate the surrounding desired area.

The demand for fluorescent fixtures & lamp holders is met entirely through import. The present (2012) demand for fluorescent fixtures & lamp holders is estimated at 182 tons. The demand for fluorescent fixtures & lamp holders is projected to reach 293 tons and 472 tons by the year 2017 and 2022, respectively.

The principal raw materials required are thermo-set plastic materials, PVC plastic granules, copper sheets, steel sheets which have to be imported.

The total investment cost of the project including working capital is estimated at Birr 13.80 million. From the total investment cost the highest share (Birr 8.68 million or 62.89%) is accounted by fixed investment cost followed by initial working capital (Birr 3.54 million or 25.68%) and pre operation cost (Birr 1.58 million or 11.43%). From the total investment cost Birr 3.60 million or 26.09% is required in foreign currency.

The project is financially viable with an internal rate of return (IRR) of 25.54% and a net present value (NPV) of Birr 11.94 million discounted at 10%.

The project can create employment for 19 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 florescent tubes and lamps factories and also generates income for the Government in terms of tax revenue and payroll tax.

II. PRODUCT DESCRIPTION AND APPLICATIONS

Florescent fixtures are devices that are used to hold florescent tubes in place and in contact with the various electrical devices so that the tubes emit the proper desired light. The fixture is made from thin sheet metal and plastic insulator parts to support the tube, the ballasts and the starters. Lamp holders are devices that are used to hold lamps suspended on the ceiling or on walls, tables etc. to illuminate the surrounding desired area.

III. MARKET STUDY AND PLANT CAPACITY

A. MARKET STUDY

1. Past Supply and Present Demand

Since there are no local producers of fluorescent fixtures and lamp holders the local demand for the products is met through import. Table 3.1 shows the annual import of fluorescent fixtures and lamp holders during the period 2002 -2011.

Table 3.1

IMPORT OF FLUORESCENT FIXTURES AND LAMP HOLDERS (TONS)

Year	Import
2002	35
2003	53
2004	80
2005	40
2006	78
2007	207
2008	156
2009	208
2010	163
2011	60

Source: *– Ethiopian Revenue and Custom Authorities.*

As can be seen from Table 3.1, import or total supply of fluorescent fixtures and lamp holders fluctuate from year to year. However, a general growth trend can still be observed. For example, the average annual import which was 57 tons during the first five years (2002-2006) has increased to an average of 159 tons during the successive five years (2006-2011). Moreover, during the period under consideration (2002-2011) import or apparent consumption of fluorescent fixtures and lamp holders has registered an average annual growth rate of 26.60%.

For estimating the present demand for the product under consideration, it is assumed that the growth rate registered in the past will also continue at least in the near future. Hence by taking a recent three years (2009-2011) average as a base and applying a growth rate of 26.60% the present (2012) demand for fluorescent fixtures and lamp holders is estimated at 182 tons.

2. Projected Demand

The demand for fluorescent fixtures and lamp holders is directly related with the growth in housing construction and the expansion of electricity supply, which in turn depends on the overall economic development of the country.

The construction and energy sector of the country has undergone tremendous changes 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 fluorescent fixtures and lamp holders 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%. The power generation capacity of the country is also planned to increase from the current 2000MW to more than 6000MW in the coming five years.

Accordingly, based on the above discussion and in order to be conservative a growth rate of 10% which is slightly lower than the expected growth rate of the country's GDP during the GTP period (2011 – 2015) is used.

Based on the above assumption and using the estimated present demand as a base the projected demand for fluorescent fixtures and lamp holders is shown in Table 3.2.

Table 3.2

FORECASTED DEMAND (TONS)

Year	Projected Demand
2013	200
2014	220
2015	242
2016	266
2017	293
2018	322
2019	354
2020	390
2021	429
2022	472
2023	519
2024	571
2025	628

3. Pricing and Distribution

Based on the CIF value of the products import during 2011 and adding 30% to account for duty and other import related expenses a factory gate price of Birr 42,890/ton and Birr 95,011/ton for lamp holders and fluorescent fixtures respectively is recommended for the envisaged plant.

Currently the product is distributed mainly through building materials shops. The envisage plant can also use the existing building materials shops or establish own distribution centers in major urban areas.

B. PLANT CAPACITY AND PRODUCTION PROGRAM

1. Plant Capacity

Based on the market study and available technologies, a plant with a manufacturing capacity of 200 tons of florescent fixtures and 60 tons of lamp holders per annum is selected. The plant will operate 300 days in a year on a single shift basis.

2. Production Program

The plant will start to operate at 75% of its installed capacity during the first year of operation. In the second year it will increase to 85% and in the third year and then after it will operate at full capacity (see Table 3.3).

Table 3.3

ANNUAL PRODUCTION PROGRAM

Type of Product	Year 1	Year 2	Year 3-10
Florescent fixtures (Tons)	150	170	200
Lamp holders (Tons)	45	51	60
Capacity %	75	85	100

IV. RAW MATERIAL AND INPUTS

A. RAW AND AUXILIARY MATERIALS

The major raw materials required for the production of fluorescent fixtures and lamp holders are thermo-set plastic materials, PVC plastic granules, copper sheets, steel sheets etc., that have to be

imported they cost Birr 2.52 million in foreign currency. The required quantity of raw materials at full capacity operation and their costs are shown in Table 4.1.

Table 4.1

RAW MATERIALS AND ANNUAL COST

Sr. No	Raw Materials	Annual Requirement (ton)	Cost (000 Birr)		
			F.C	L.C	Total
1	Steel Sheet metal	100	1,800.00	450.00	2,250.00
2	PVC granules	25	1,500.00	375.00	1,875.00
3	Brass wires	10	600.00	150.00	750.00
4	Thermo-set plastic material	5	275.00	68.75	343.75
6	Enameled Copper wires	90	5,400.00	1,350.00	6,750.00
7	Brass sheets	30	1,800.00	450.00	2,250.00
9	Starters	1.5	67.50	16.88	84.38
10	PVC Insulated Copper Wires	0.5	17.50	4.38	21.88
11	Paint	2	60.00	15.00	75.00
12	Packing material	10	250.00	62.50	312.50
	Total		**11,520.00**	**2,880.00**	**14,712.50**

B. UTILITIES

The utilities required by the plant are electricity and water. Annual cost of utilities at full capacity operation is Birr 72,505. Details of utility requirement and cost are given in Table 4.2

Table 4.2

ANNUAL UTILITIES REQUIREMENT & COST

No	Utility	Unit	Quantity	Cost(Birr)
1	Electricity	kWh	175,000	105,000
2	Water	Meter cube	5,000	50,000
	Total			**155,000**

V. TECHNOLOGY AND ENGINEERING

A. TECHNOLOGY

1. Process Description

The manufacturing of florescent fixtures involves four different parts as described below.

- The metallic casing is made from sheet metal of 0.4mm thick by cutting, punching drilling and bending process.
- The plastic insulators at the ends of the florescent tube are manufactured from thermo-set and thermo plastic materials, mainly by plastic injection molding process and thermo-set compression molding techniques.
- The starter housing is manufactured by plastic injection molding process from PVC Granules.
- The Ballast is manufactured out of sheet metal and enameled copper wire. The ballast is a device made from copper coils wound on steel sheet cores.

2. Environmental Impact

The manufacturing process does not have any negative impact on the environment. The process is mainly metal cutting punching and bending with out effect on the surrounding.

B. ENGINEERING

1. Machinery and Equipment

Total cost of machinery and equipment is Birr 4.5 million, out of which Birr 3.6 million is required in foreign currency. The list of machinery and equipment is given in Table 5.1.

Table 5.1

LIST OF MACHINERY & EQUIPMENT

Sr. No.	Machine	Description	Unit	Qty.
1	Guillotine shear machine	4mm	Nos.	1
2	Treadle shearing machine	4mm	Nos.	1
3	Sheet metal bender	4mm	Nos.	1
4	Spinning lathe	High speed	Nos.	1
5	Fly wheel press	10 Ton	"	2
6	Spot welding machine	3kva	'	2
7	Plastic injection Molder	50gm cap.	"	1
8	Thermo plastic Molders	50gmcap.	"	1
8	Set of molds	Florescent, holder	set	3
9	Mechanical press	30 ton,	Nos.	1
10	Set of Dies(Cooper sheet)	End contact heads	set	5
11	Coil former and winder	Manual winder	Set.	2
12	Paint spray and drier set		Set	1
13	Testing and measuring inst.	Electric testers	Set	2
14	Material handling equipment		set	2

2. Land, Building and Civil Works

The plant requires a total of 1,000 m^2 area of land out of which 600 m^2 is built-up area which includes manufacturing area, raw material stock area, offices etc. Assuming construction rate of Birr 5,000 per m^2, the total cost of construction is estimated to be Birr 3 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 5000 m^2, 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 m^2, 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 m^2. 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 m^2 .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 m^2 (see Table 5.2).

Table 5.2

NEW LAND LEASE FLOOR PRICE FOR PLOTS IN ADDIS ABABA

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

V. HUMAN RESOURCE AND TRAINING REQUIREMENT

A. HUMAN RESOURCE REQUIREMENT

The plant will employ 23 persons of whom 14 are production workers. Annual cost of labour, including employees benefit, is Birr 620,225. The human resource requirement by type of job and monthly and annual salary is given in Table 6.1.

Table 6.1

HUMAN RESOURCE REQUIREMENT AND COST

Sr. No.	Description	No.	Salary (Birr)	
			Monthly	Annual
A. ADMINISTRATION				
1	Plant Manager	1	5,000	60,000
2	Secretary	1	2,500	30,000
3	Accountant	1	2,500	30,000
4	Salesman/purchaser	1	2,500	30,000
5	Clerk	1	1,500	18,000
6	Cashier	1	2,000	24,000
7	General Service	3	800	28,800
Sub -Total		**9**		**220,800**
B. PRODUCTION				
8	Foreman/	1	2,500	30,000
9	Machinery Operators	8	2,000	192,000
10	Assistant Operators	1	1,500	18,000
11	Machinist technicians	1	2,000	24,000
12	Quality controller	1	1,500	18,000
13	Laborers	2	800	16,200
Sub -Total		**14**	**-**	**298,200**
				519,000
Employee's Benefit (25% Of Basic Salary)		-	-	101,225
Total		**23**	**-**	**620,225**

B. TRAINING REQUIREMENT

On the job training of the operators would be enough for workers with technical back ground. This requires an amount of 20,000 birr for one round demonstration and training.

VII. FINANCIAL ANALYSIS

The financial analysis of the fluorescent fixtures & lamp holders 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 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 13.80 million (See Table 7.1). From the total investment cost the highest share (Birr 8.68 million or 62.89%) is accounted by fixed investment cost followed by initial working capital (Birr 3.54 million or 25.68%) and pre operation cost (Birr 1.58 million or 11.43%). From the total investment cost Birr 3.60 million or 26.09% 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	0.19
1.2	Building and civil work	3,000.00		3,000.00	21.74
1.3	Machinery and equipment	900.00	3,600.00	4,500.00	32.62
1.4	Vehicles	900.00		900.00	6.52
1.5	Office furniture and equipment	250.00		250.00	1.81
	Sub total	**5,076.60**	**3,600.00**	**8,676.60**	**62.89**
2	**Pre operating cost ***				
2.1	Pre operating cost	675.00		675.00	4.89
2.2	Interest during construction	902.59		902.59	6.54
	Sub total	**1,577.59**		**1,577.59**	**11.43**
3	**Working capital ****	**3,542.50**		**3,542.50**	**25.68**
	Grand Total	**10,196.69**	**3,600.00**	**13,796.69**	**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 5.08 million. However, only the initial working capital of Birr 3.54 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 19.04 million (see Table 7.2). The cost of raw material account for 77.27% of the production cost. The other major components of the production cost are depreciation, financial cost, direct labor, and cost of marketing and distribution which account for 7.14%, 4.56%, 2.73%, and 3.94% respectively. The remaining 4.36% is the share of utility, repair and maintenance, labor 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	14,713	77.27
Utilities	155	0.81
Maintenance and repair	225	1.18
Labor direct	519	2.73
Labor overheads	101	0.53
Administration Costs	350	1.84
Land lease cost	0	0.00
Cost of marketing and distribution	750	3.94
Total Operating Costs	**16,813**	**88.30**
Depreciation	1,360	7.14
Cost of Finance	869	4.56
Total Production Cost	**19,042**	**100.00**

C. FINANCIAL EVALUATION

1. Profitability

Based on the projected profit and loss statement, the project will generate a profit throughout its operation life. Annual net profit after tax will grow from Birr 1.86 million to Birr 3.23 million during the life of the project. Moreover, at the end of the project life the accumulated net cash flow amounts to Birr 29.07 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.

$$\text{Break Even Sales Value} = \frac{\text{Fixed Cost + Financial Cost}}{\text{Variable Margin ratio (\%)}} = \text{Birr } 9{,}061{,}920$$

$$\text{Break Even Capacity utilization} = \frac{\text{Break even Sales Value}}{\text{Sales revenue}} \times 100 = 38.27\%$$

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 4 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 25.54% 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 11.94 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 19 persons. The project will generate Birr 8.17 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 forward linkage with the florescent tubes and lamps factories and also generates other income for the Government.

Appendix 7.A

FINANCIAL ANALYSES SUPPORTING TABLES

Appendix 7.A.1
NET WORKING CAPITAL (in 000 Birr)

Items	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11
Total inventory	2,574.78	3,310.43	3,678.25	3,678.25	3,678.25	3,678.25	3,678.25	3,678.25	3,678.25	3,678.25
Accounts receivable	999.51	1,267.23	1,401.08	1,401.08	1,401.80	1,401.80	1,401.80	1,401.80	1,401.80	1,401.80
Cash-in-hand	11.62	14.94	16.60	16.60	16.72	16.72	16.72	16.72	16.72	16.72
CURRENT ASSETS	**3,585.90**	**4,592.59**	**5,095.93**	**5,095.93**	**5,096.76**	**5,096.76**	**5,096.76**	**5,096.76**	**5,096.76**	**5,096.76**
Accounts payable	43.40	55.80	62.00	62.00	62.00	62.00	62.00	62.00	62.00	62.00
CURRENT LIABILITIES	**43.40**	**55.80**	**62.00**	**62.00**	**62.00**	**62.00**	**62.00**	**62.00**	**62.00**	**62.00**
TOTAL WORKING CAPITAL	**3,542.50**	**4,536.79**	**5,033.93**	**5,033.93**	**5,034.76**	**5,034.76**	**5,034.76**	**5,034.76**	**5,034.76**	**5,034.76**

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	10,299	13,242	14,713	14,713	14,713	14,713	14,713	14,713	14,713	14,713
Utilities	109	140	155	155	155	155	155	155	155	155
Maintenance and repair	158	203	225	225	225	225	225	225	225	225
Labour direct	363	467	519	519	519	519	519	519	519	519
Labour overheads	71	91	101	101	101	101	101	101	101	101
Administration Costs	245	315	350	350	350	350	350	350	350	350
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	**11,994**	**15,207**	**16,813**	**16,813**	**16,822**	**16,822**	**16,822**	**16,822**	**16,822**	**16,822**
Depreciation	1,360	1,360	1,360	1,360	1,360	145	145	145	145	145
Cost of Finance	0	993	869	745	621	496	372	248	124	0
Total Production Cost	**13,354**	**17,560**	**19,042**	**18,918**	**18,802**	**17,463**	**17,339**	**17,215**	**17,091**	**16,967**

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	15,103	19,418	21,576	21,576	21,576	21,576	21,576	21,576	21,576	21,576
Less variable costs	11,244	14,457	16,063	16,063	16,063	16,063	16,063	16,063	16,063	16,063
VARIABLE MARGIN	**3,859**	**4,961**	**5,513**	**5,513**	**5,513**	**5,513**	**5,513**	**5,513**	**5,513**	**5,513**
in % of sales revenue	25.55	25.55	25.55	25.55	25.55	25.55	25.55	25.55	25.55	25.55
Less fixed costs	2,110	2,110	2,110	2,110	2,119	904	904	904	904	904
OPERATIONAL MARGIN	**1,749**	**2,851**	**3,403**	**3,403**	**3,394**	**4,609**	**4,609**	**4,609**	**4,609**	**4,609**
in % of sales revenue	11.58	14.68	15.77	15.77	15.73	21.36	21.36	21.36	21.36	21.36
Financial costs		993	869	745	621	496	372	248	124	0
GROSS PROFIT	**1,749**	**1,858**	**2,534**	**2,658**	**2,774**	**4,113**	**4,237**	**4,361**	**4,485**	**4,609**
in % of sales revenue	11.58	9.57	11.75	12.32	12.86	19.06	19.64	20.21	20.79	21.36
Income (corporate) tax	0	0	0	798	832	1,234	1,271	1,308	1,346	1,383
NET PROFIT	**1,749**	**1,858**	**2,534**	**1,861**	**1,942**	**2,879**	**2,966**	**3,053**	**3,140**	**3,227**
in % of sales revenue	11.58	9.57	11.75	8.62	9.00	13.34	13.75	14.15	14.55	14.95

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	**9,352**	**19,591**	**19,430**	**21,582**	**21,576**	**21,576**	**21,576**	**21,576**	**21,576**	**21,576**	**21,576**	**7,764**
Inflow funds	9,352	4,488	12	6	0	0	0	0	0	0	0	0
Inflow operation	0	15,103	19,418	21,576	21,576	21,576	21,576	21,576	21,576	21,576	21,576	0
Other income	0	0	0	0	0	0	0	0	0	0	0	7,764
TOTAL CASH OUTFLOW	**9,352**	**16,483**	**18,447**	**19,426**	**19,596**	**19,516**	**19,793**	**19,706**	**19,619**	**19,532**	**18,204**	**0**
Increase in fixed assets	9,352	0	0	0	0	0	0	0	0	0	0	0
Increase in current assets	0	3,586	1,007	503	0	1	0	0	0	0	0	0
Operating costs	0	11,244	14,457	16,063	16,063	16,072	16,072	16,072	16,072	16,072	16,072	0
Marketing and Distribution cost	0	750	750	750	750	750	750	750	750	750	750	0
Income tax	0	0	0	0	798	832	1,234	1,271	1,308	1,346	1,383	0
Financial costs	0	903	993	869	745	621	496	372	248	124	0	0
Loan repayment	0	0	1,241	1,241	1,241	1,241	1,241	1,241	1,241	1,241	0	0
SURPLUS (DEFICIT)	**0**	**3,109**	**983**	**2,156**	**1,980**	**2,060**	**1,783**	**1,870**	**1,957**	**2,044**	**3,372**	**7,764**
CUMULATIVE CASH BALANCE	**0**	**3,109**	**4,092**	**6,248**	**8,228**	**10,288**	**12,071**	**13,941**	**15,898**	**17,941**	**21,313**	**29,077**

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**	**15,103**	**19,418**	**21,576**	**21,576**	**21,576**	**21,576**	**21,576**	**21,576**	**21,576**	**21,576**	**7,764**
Inflow operation	0	15,103	19,418	21,576	21,576	21,576	21,576	21,576	21,576	21,576	21,576	0
Other income	0	0	0	0	0	0	0	0	0	0	0	7,764
TOTAL CASH OUTFLOW	**12,894**	**12,988**	**15,704**	**16,813**	**17,611**	**17,654**	**18,055**	**18,093**	**18,130**	**18,167**	**18,204**	**0**
Increase in fixed assets	9,352	0	0	0	0	0	0	0	0	0	0	0
Increase in net working capital	3,543	994	497	0	1	0	0	0	0	0	0	0
Operating costs	0	11,244	14,457	16,063	16,063	16,072	16,072	16,072	16,072	16,072	16,072	0
Marketing and Distribution cost	0	750	750	750	750	750	750	750	750	750	750	0
Income (corporate) tax		0	0	0	798	832	1,234	1,271	1,308	1,346	1,383	0
NET CASH FLOW	**-12,894**	**2,115**	**3,714**	**4,763**	**3,965**	**3,922**	**3,521**	**3,483**	**3,446**	**3,409**	**3,372**	**7,764**
CUMULATIVE NET CASH FLOW	**-12,894**	**-10,779**	**-7,065**	**-2,302**	**1,662**	**5,585**	**9,105**	**12,588**	**16,035**	**19,443**	**22,815**	**30,579**
Net present value	-12,894	1,922	3,070	3,579	2,708	2,435	1,987	1,787	1,608	1,446	1,300	2,993
Cumulative net present value	-12,894	-10,972	-7,902	-4,324	-1,616	820	2,807	4,594	6,202	7,648	8,948	11,941

NET PRESENT VALUE	11,941
INTERNAL RATE OF RETURN	25.54%
NORMAL PAYBACK	4 years