

Pre-Feasibility Study

(Ground Calcium Carbonate Mill)



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Government of Pakistan

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Table of Contents

1. DISCLAIMER	3
2. EXECUTIVE SUMMARY.....	3
3. PURPOSE OF THE DOCUMENT	4
4. INTRODUCTION TO SMEDA.....	4
5. BRIEF DESCRIPTION OF PROJECT AND PRODUCT	5
5.1) PRODUCTION PROCESS FLOW	6
5.2) INSTALLED AND OPERATIONAL CAPACITIES.....	7
6. CRITICAL FACTORS	8
7. GEOGRAPHICAL POTENTIAL FOR INVESTMENT.....	8
8. POTENTIAL TARGET CUSTOMER/MARKETS	8
9. PROJECT COST SUMMARY.....	9
9.1) PROJECT ECONOMICS.....	9
9.2) PROJECT FINANCING	10
9.3) PROJECT COST.....	10
9.4) SPACE REQUIREMENT	11
9.5) MACHINERY AND EQUIPMENT.....	11
9.6) FURNITURE AND FIXTURES.....	12
9.7) OFFICE EQUIPMENT.....	12
9.8) HUMAN RESOURCE REQUIREMENT.....	13
9.9) UTILITIES AND OTHER COSTS (RAW MATERIAL AND OTHER EXPENSES).....	13
9.10) REVENUE GENERATION.....	14
10. CONTACTS.....	15
11. USEFUL WEB LINKS.....	16
12. ANNEXURES	17
12.1) INCOME STATEMENT.....	17
12.2) BALANCE SHEET	18
12.3) CASH FLOW STATEMENT.....	19
13. KEY ASSUMPTIONS.....	20
13.1) OPERATING COST ASSUMPTIONS	20
13.2) PRODUCTION COST ASSUMPTIONS.....	20
13.3) REVENUE ASSUMPTIONS.....	20
13.4) ECONOMY RELATED ASSUMPTIONS.....	20

1. DISCLAIMER

This information memorandum is to introduce the subject matter and provide a general idea and information on the said matter. Although, the material included in this document is based on data/information gathered from various reliable sources; however, it is based upon certain assumptions which may differ from case to case. The information has been provided on as is where is basis without any warranties or assertions as to the correctness or soundness thereof. Although, due care and diligence has been taken to compile this document, the contained information may vary due to any change in any of the concerned factors, and the actual results may differ substantially from the presented information. SMEDA, its employees or agents do not assume any liability for any financial or other loss resulting from this memorandum in consequence of undertaking this activity. The contained information does not preclude any further professional advice. The prospective user of this memorandum is encouraged to carry out additional diligence and gather any information which is necessary for making an informed decision; including taking professional advice from a qualified consultant/technical expert before taking any decision to act upon the information.

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2. EXECUTIVE SUMMARY

The project is about setting up Calcium Carbonate Processing Unit in KP province. The project may be located at any industrial estate/economic zone with minimum possible distance to limestone or marble mines having required quality and quantity supply.

This specific project will have an installed capacity of 20,592 (3 tons per hour) while starting with 12,355 tons per year the first year, and then increasing by 5% every year, it will attain maximum capacity of 95%.

Total cost of establishing the proposed project will be **Rs. 93.04 million**, of which **Rs. 85.3 million** will be the capital cost whereas the working capital will be **Rs. 7.7 million**. Given the cost assumptions, Internal Rate of Return (IRR), payback, and NPV are **98%**, **1.29 years**, and **Rs. 415,065,064** respectively.

The most critical consideration or factors for success of the project are:

- Distance from quarry to processing unit should be minimum
- Quality of raw material (preferably pure white marble)

- Sufficient supply of electricity
- High quality energy efficient roller mills

3. PURPOSE OF THE DOCUMENT

The objective of the pre-feasibility study is primarily to facilitate potential entrepreneurs in project identification for investment. The project pre-feasibility may form the basis of an important investment decision and in order to serve this objective, the document/study covers various aspects of project concept development, start-up, and production, marketing, finance and business management.

The purpose of this document is to facilitate potential investors in **Calcium Carbonate grinding** by providing them with a general understanding of the business with the intention of supporting potential investors in crucial investment decisions.

The need to come up with pre-feasibility reports for undocumented or minimally documented sectors attains greater imminence as the research that precedes such reports reveal certain thumb rules; best practices developed by existing enterprises by trial and error, and certain industrial norms that become a guiding source regarding various aspects of business set-up and its successful management.

Apart from carefully studying the whole document one must consider critical aspects provided later on, which form basis of any Investment Decision.

4. INTRODUCTION TO SMEDA

The Small and Medium Enterprises Development Authority (SMEDA) was established in October 1998 with an objective to provide fresh impetus to the economy through development of Small and Medium Enterprises (SMEs).

With a mission "to assist in employment generation and value addition to the national income, through development of the SME sector, by helping increase the number, scale and competitiveness of SMEs", SMEDA has carried out 'sectoral research' to identify policy, access to finance, business development services, strategic initiatives and institutional collaboration and networking initiatives.

Preparation and dissemination of prefeasibility studies in key areas of investment has been a successful hallmark of SME facilitation by SMEDA.

Concurrent to the prefeasibility studies, a broad spectrum of business development services is also offered to the SMEs by SMEDA. These services include identification of experts and consultants and delivery of need based capacity building programs of different types in addition to business guidance through help desk services.

5. BRIEF DESCRIPTION OF PROJECT AND PRODUCT

The project is related to setting up Calcium Carbonate Mill with following detail:

- **Technology:** The proposed unit will start with imported Roller mill and allied equipment.
- **Location:** The unit may be located at areas having abundant supply of pure white marble and nearest to mining areas.
- **Product:** The unit will process calcium carbonate powder of different mesh sizes including 400, 600, and 2,500.
- **Target Market:** Local and export market comprising of Agriculture, Nutraceuticals, Paint, Packing, Paper, Pharmaceuticals, and Rubber industry.
- **Employment Generation:** The proposed project will initially provide direct employment to 23 people.
- **Profitability:** The Financial Analysis shows the unit to be profitable from the very first year of the operation.

5.1) Production Process Flow

This particular study is about the processing of Ground Calcium Carbonate (GCC) with the following machinery:

Core Machinery	Process
Primary Jaw Crusher	This machine starts the process by crushing handpick limestone/marble of 15 to 25 Kg weight into pebbles of 50 mm.
Conveyor Belt	Carries the pebbles to the secondary crushing machine
Syndicator for Secondary Crushing	Here the pebbles from primary crusher are further crushed into pieces of 5 to 25 mm
Bucket Elevator	Takes the material from syndicator to main unit of grinding mill
Grinding Mill- Main Unit (Roller Technology)	Grinds the material into required mesh sizes
Air Blowers	Inhales air within the grinding mill which makes the grinded material to come to classifier
Classifiers	This upon receiving the grinding material with airflow, screens it into required sizes. The unclassified particles fall and sent back to grinding mill for regrinding whereas the classified powder is sent to cyclone collector.
Cyclone Powder Collectors	Dominant portion of the powder falls into conveyor
Dust Collectors	Fine particles still mixed in air, travel to the dust cleaner and cling to the filter bags in it. The vibrating filter bags cause these particles to fall into conveyor, so that it along-with the powder from cyclone collector goes to filling in bags

Supporting Equipment	Function
Screw Air compressor	Intakes air of 1 bar pressure from ambient and after compressing it to required pressure above 7 bars, send it to air vessel
Air vessel	Stores the compressed air so that it cools down to minor extent and flows into air dryer through prefilter
Pre Filter	This collects dust up to 1 micron from the air to be safe for air dryer and processing machines
Refrigerated Dryers	These remove moisture from the air, so that to keep the processing line and the product safe
After Filter	Once dried, the air must be free of oil particles up to 0.1 micron size. This is done by after filter. Now this clean dry air is pushed into the system



The investor may consider a combination of imported and local machinery such that, the grinding mill is imported and all other machines and silos are locally fabricated. This will save handsome amount of capital cost.

5.2) Installed and Operational Capacities

The plant will have installed capacity of 20,592 tons per year. Initially it will start with 12,355 tons per year operations and within 08 years attain maximum capacity of 95%.

6. CRITICAL FACTORS

The following factors should be considered thoroughly:

- Being bulk oriented mineral, the lesser the distance from quarry to processing unit, the lesser the transportation and hence cost of raw material
- Quality of raw material (preferably pure white marble), free from impurities
- Selection of site with sufficient supply of electricity
- High quality energy efficient roller mills to ensure wide range of finest mesh processing

7. GEOGRAPHICAL POTENTIAL FOR INVESTMENT

The project may be established in processing zones with least distance to marble mines of required quality. These areas include, district Buner, Khyber, Mardan, Mohmand, Nowshera of Khyber Pakhtunkhwa. The option may also be considered at Karachi, provided there is sufficient waste available from white marble processing units.

8. POTENTIAL TARGET CUSTOMER/MARKETS

Generally, the calcium carbonate has huge demand in Local, National, and International markets. With an average annual growth rate of 5%, the world market for this product is estimated to be USD 34.28 billion by the year 2025. This has the following applications:

- Fine Powder above 1,500 mesh: Pharmaceutical Companies
- Plastic: The coated GCC especially, improves the skeleton, stability of plastic size and hardness. It improves the surface gloss of plastic. Calcium carbonate due to having above 90% whiteness is also a best alternate to the costly white pigment.
- Powder below 1,500 mesh:
 - Agriculture: PH control, fertilizer conditioner, animal nutrition.
 - Architecture, and Construction: Stable colour quality appealing to the aesthetic sense, makes the calcium carbonate to be highly demanded product by architects. The construction industry demands it due to

improvement of concrete in terms of density, pre-stability and durability.

- Packaging: Environmental friendly bags production due to reduction in carbon emissions and energy requirements. In PE films manufacturing, it increases line speed and specific output.
- Paper: Because of operational flexibility
- Nutraceuticals: 400 mesh GCC is used in nutraceutical companies with a ratio of 40% powder in calcium products.
- Paint: Calcium Carbonate comprises of more than 30% in thick paint, 4 to 7% in phenolic enamel, and 39% in fine wrinkle paint 39%.
- Rubber: Increases the volume of rubber products to save expensive natural rubber usage, so that to reduce production cost. Besides, it adds to the tensile strength abrasion resistance, tear strength, and reinforces the natural and synthetic rubber.

9. PROJECT COST SUMMARY

A detailed financial model has been developed to analyze the commercial viability of the Calcium Carbonate Grinding Mill. Various cost and revenue related assumptions along with results of the analysis are outlined in this section.

9.1) Project Economics

All the figures in this financial model have been calculated for installed and operational capacity as mentioned in the above section.

The following table shows internal rates of return and payback period.

Table 01 - Project Economics

Description	Details
Internal Rate of Return (IRR)	98%
Payback Period	1.29 Years
Net Present Value (NPV) @ 20%	Rs.415,065,064

9.2) Project Financing

Following table provides details of the equity required and variables related to bank loan;

Table 02 - Project Financing

Description	Details
Total Equity (50%)	Rs.46,521,404
Bank Loan (50%)	Rs.46,521,404

9.3) Project Cost

Following requirements have been identified for operations of the proposed business.

Table 03: Project Cost

Description	Amount Rs.
Capital Cost	
Land (01 Acre)	12,000,000
Infrastructure Development	28,375,000
Machinery and Equipment	43,000,000
Furniture and Fixtures	924,000
Office Equipment	500,000
Pre-operating Cost	500,000
Total Capital Cost	85,299,000
Working Capital	
Spare Parts Inventory	1,420,848
Raw Material Inventory	143,000
Cash	6,179,169
Total Working Capital	7,743,809
Total Project Cost	93,042,809

9.4) Space Requirement

This proposed project may be established on 01 Acre land acquired on ownership or lease. This study assumes own land for working.

Table 04: Space Requirement

Space Requirement (in Sq. ft.)	Rs/Unit	Units	Amount (Rs.)
Production Hall Cum Finished Goods Store (60 x 90) with height of 40 ft- Preferably with UPVC material prefabricated.	4,000	5,400	21,600,000
Compressor Room	3,000	225	675,000
Electric Control Room	3,000	100	300,000
Management Building	4,000	900	3,600,000
Rooms for Labour	4,000	225	900,000
Washrooms	2,000	200	400,000
Kitchen	2,000	100	200,000
Boundary Wall			700,000
Total			28,375,000

9.5) Machinery and Equipment

Following table provides list of machinery and equipment:

Table 05: List of Machinery and Equipment

Machinery	Rs/Unit	Units	Amount (Rs.)
Complete Roller Mill Plant	42,000,000	01	42,000,000
Installation and Commissioning	-	-	1,000,000
Total			43,000,000

9.6) Furniture and Fixtures

Table 06: List of Machinery and Equipment

Item	Rs/Unit	Units	Amount (Rs.)
Ceiling Fans	8,000	08	64,000
Split AC	200,000	02	400,000
Cots For Labor	12,000	10	120,000
Tables	10,000	06	60,000
Chairs	5,000	12	60,000
Cupboards	20,000	06	120,000
Miscellaneous		-	100,000
Total		44	924,000

9.7) Office Equipment

Such type of project only requires a cell phone for communication. However, in order to get things right from the beginning, following items are advised:

Table 07: List of Furniture and Fixtures

Item	Units	Cost Rs/unit	Total (Rs.)
PC with UPS and Printers	02	250,000	500,000
Total			500,000

9.8) Human Resource Requirement

Following salaries are on monthly basis:

Table 08: Payroll For Financial Analysis (Human Resource Requirements)

Designation	Rs/Unit	Units	Amount (Rs.)
CEO	200,000	01	200,000
Admin and Accounts Officer	80,000	01	80,000
Marketing Officer	80,000	01	80,000
Electrician	50,000	01	50,000
Plant Mechanic	50,000	01	50,000
Chowkidar	30,000	02	60,000
Office Boy	30,000	01	30,000
Total		08	550,000

Total direct labor cost is Rs. 65,235,456 with 15 direct labour (production and loading) for 02 shifts per day. These are paid on piece rate basis as given below:

+ Production Labour: Rs. 300 per ton

+ Loading labour: Rs.140 per ton

9.9) Utilities and Other Costs (Raw Material and Other Expenses)

Table 09: Raw Material Cost

Item	Units	Rs./Unit	Total Cost (Rs.)
Stone	Ton	3,400	42,007,680
Packing	Ton	1,200	14,826,240
Total			56,833,920

Table 10: Miscellaneous

Description	Rs./Year
Machinery Maintenance	171,600
Direct Electricity	47,196,864
Direct Water	16,474

Detail of administrative expenses is reflected in the attached income statement

9.10) Revenue Generation

Revenue may vary as per the combination of product mix sold. Normally, the 600 mesh remains to be 60% of the total production. Products of few prices are given for a fair idea:

- 20% of production to be 2500 Mesh @ Rs. 85,000 per ton
- 40% of production to be 600 Mesh @ Rs. 9,000 per ton
- 40% of production to be 400 Mesh @ Rs. 7,000 per ton

Table 11: Revenue Generation

Product	Unit	Selling Price (Rs./Unit)	First Year Production	First Year Revenue (Rs)
Ground Calcium Carbonate	Tons	23,400	1,255	289,111,680
			Total	289,111,680

10. CONTACTS

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11. USEFUL WEB LINKS

Small & Medium Enterprises Development Authority (SMEDA)	www.smeda.org.pk
Government of Pakistan	www.pakistan.gov.pk
Government of Punjab	www.punjab.gov.pk
Government of Sindh	www.sindh.gov.pk
Government of Khyber Pakhtunkhwa	www.khyberpakhtunkhwa.gov.pk
Government of Balochistan	www.balochistan.gov.pk
Government of Gilgit Baltistan	www.gilgitbaltistan.gov.pk
Government of Azad Jamu Kashmir	www.ajk.gov.pk
Security Commission of Pakistan (SECP)	www.secp.gov.pk
Federation of Pakistan Chambers of Commerce and Industry (FPCCI)	www.fpcci.com.pk
State Bank of Pakistan (SBP)	www.sbp.org.pk
Khyber Pakhtunkhwa Economic Zones Development and Management Company	www.kpezdmc.org.pk
Lasbela Industrial Estates Development Authority	www.lieda.gov.pk
Pakistan Stones Development Company	www.pasdec.org.pk

12. ANNEXURES

12.1) Income Statement

	Year 1	Monthly	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue	289,111,680	24,092,640	344,524,752	408,129,322	481,009,558	564,384,548	659,624,440	768,268,465	892,045,051	981,249,557	1,079,374,512
<i>Cost of sales</i>		-									
Cost of goods sold 1	42,007,680	3,500,640	50,059,152	59,300,842	69,890,278	82,004,592	95,842,867	111,628,751	129,613,384	142,574,722	156,832,194
Cost of goods sold 2	14,826,240	1,235,520	17,667,936	20,929,709	24,667,157	28,942,797	33,826,894	39,398,383	45,745,900	50,320,490	55,352,539
Cost of goods sold 3	47,196,864	3,933,072	56,242,930	66,626,240	78,523,782	92,134,571	107,682,280	125,418,185	145,624,449	160,186,893	176,205,583
Operation costs 1 (direct labor)	65,235,456	5,436,288	71,759,002	78,934,902	86,828,392	95,511,231	105,062,354	115,568,590	127,125,449	139,837,993	153,821,793
Operating costs 2 (machinery maintenance)	171,600	14,300	188,760	207,636	228,400	251,240	276,364	304,000	334,400	367,840	404,624
Total Cost of Sales	169,437,840	14,119,820	195,917,779	225,999,328	260,138,008	298,844,432	342,690,760	392,317,909	448,443,581	493,287,939	542,616,733
Gross Profit	119,673,840	9,972,820	148,606,973	182,129,994	220,871,549	265,540,116	316,933,680	375,950,556	443,601,471	487,961,618	536,757,780
<i>General administration & selling expenses</i>		-									
Administration expense	6,600,000	550,000	7,260,000	7,986,000	8,784,600	9,663,060	10,629,366	11,692,303	12,861,533	14,147,686	15,562,455
Building rental expense	-	-	-	-	-	-	-	-	-	-	-
Electricity expense	360,000	30,000	396,000	435,600	479,160	527,076	579,784	637,762	701,538	771,692	848,861
Water expense	16,474	1,373	18,121	19,934	21,927	24,120	26,532	29,185	32,103	35,313	38,845
Gas expense	96,000	8,000	105,600	116,160	127,776	140,554	154,609	170,070	187,077	205,785	226,363
Travelling expense	720,000	60,000	792,000	871,200	958,320	1,054,152	1,159,567	1,275,524	1,403,076	1,543,384	1,697,722
Communications expense (phone, internet, etc.)	60,000	5,000	66,000	72,600	79,860	87,846	96,631	106,294	116,923	128,615	141,477
Office vehicles running expense	-	-	-	-	-	-	-	-	-	-	-
Office expenses (stationary, janitorial, etc.)	180,000	15,000	198,000	217,800	239,580	263,538	289,892	318,881	350,769	385,846	424,431
Promotional expense	600,000	50,000	660,000	726,000	798,600	878,460	966,306	1,062,937	1,169,230	1,286,153	1,414,769
Insurance expense	-	-	-	-	-	-	-	-	-	-	-
Professional fees (legal, audit, consultants, etc.)	120,000	10,000	132,000	145,200	159,720	175,692	193,261	212,587	233,846	257,231	282,954
Depreciation and amortization expense	9,676,100	-	8,359,060	7,232,139	6,266,211	5,436,989	4,624,123	4,010,498	3,481,675	3,025,429	2,631,390
Subtotal	18,428,574	729,373	17,986,781	17,822,632	17,915,754	18,251,486	18,720,070	19,516,040	20,537,771	21,787,134	23,269,266
Operating Income	101,245,266	9,243,447	130,620,191	164,307,362	202,955,795	247,288,629	298,213,611	356,434,516	423,063,700	466,174,484	513,488,514
<i>Other Income</i>		-									
Earnings Before Interest & Taxes	101,245,266	9,243,447	130,620,191	164,307,362	202,955,795	247,288,629	298,213,611	356,434,516	423,063,700	466,174,484	513,488,514
<i>Interest on Bank Overdraft</i>		-									
Interest expense on Project Loan	10,662,375	888,531	10,662,375	10,249,142	9,732,600	9,086,924	8,279,828	7,270,958	6,009,870	4,433,511	2,463,062
Interest expense on Working Capital Loan	48,399	4,033	44,635	40,825	36,967	33,061	29,105	25,101	21,046	16,941	12,784
Subtotal	10,710,774	892,564	10,707,010	10,289,967	9,769,567	9,119,984	8,308,933	7,296,058	6,030,916	4,450,452	2,475,846
Earnings Before Tax	90,534,492	8,350,883	119,913,181	154,017,395	193,186,228	238,168,645	289,904,678	349,138,458	417,032,784	461,724,032	511,012,668
<i>Tax</i>		-									
Tax	30,807,072	2,567,256	41,089,613	53,026,088	66,735,179	82,479,025	100,586,637	121,318,460	145,081,474	160,723,411	177,974,433
NET PROFIT/(LOSS) AFTER TAX	59,727,420	5,783,627	78,823,568	#####	126,451,048	155,689,620	189,318,041	227,819,998	271,951,310	301,000,621	333,038,235

12.2) Balance Sheet

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assets											
<i>Current assets</i>											
Cash & Bank	5,000,039	34,584,942	76,384,467	127,748,255	190,796,693	267,363,221	359,497,982	469,549,002	600,575,262	744,855,893	916,429,118
Accounts receivable	-	11,881,302	13,019,927	15,465,495	18,269,977	21,480,701	25,150,870	29,340,265	34,116,031	38,492,355	42,341,590
Finished goods inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment spare part inventory	143,000	173,030	209,366	253,333	306,533	370,905	448,795	543,042	657,081	795,068	-
Raw material inventory	2,600,770	3,099,250	4,038,562	5,235,707	6,757,552	8,687,678	11,130,449	14,216,057	17,201,428	20,813,728	-
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Total Current Assets	7,743,809	49,738,524	93,652,322	148,702,789	216,130,756	297,902,506	396,228,096	513,648,366	652,549,802	804,957,044	958,770,709
<i>Fixed assets</i>											
Land	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000
Building/Infrastructure	28,375,000	25,537,500	22,983,750	20,685,375	18,616,838	16,755,154	15,079,638	13,571,675	12,214,507	10,993,056	9,893,751
Machinery & equipment	43,000,000	36,550,000	31,067,500	26,407,375	22,446,269	19,079,328	16,217,429	13,784,815	11,717,093	9,959,529	8,465,599
Furniture & fixtures	924,000	785,400	667,590	567,452	482,334	409,984	348,486	296,213	251,781	214,014	181,912
Office vehicles	-	-	-	-	-	-	-	-	-	-	-
Office equipment	500,000	350,000	245,000	171,500	120,050	84,035	58,825	41,177	28,824	20,177	14,124
Total Fixed Assets	84,799,000	75,222,900	66,963,840	59,831,702	53,665,490	48,328,501	43,704,378	39,693,880	36,212,205	33,186,776	30,555,386
<i>Intangible assets</i>											
Pre-operation costs	500,000	400,000	300,000	200,000	100,000	-	-	-	-	-	-
Legal, licensing, & pre-training costs	-	-	-	-	-	-	-	-	-	-	-
Total Intangible Assets	500,000	400,000	300,000	200,000	100,000	-	-	-	-	-	-
TOTAL ASSETS	#####	125,361,424	160,916,162	208,734,491	269,896,246	346,231,006	439,932,474	553,342,246	688,762,007	838,143,820	989,326,095
Liabilities & Shareholders' Equity											
<i>Current liabilities</i>											
Accounts payable	-	2,477,170	2,965,635	3,531,256	4,185,613	4,942,077	5,816,111	6,825,626	7,954,200	8,830,350	8,736,549
Bank Overdraft	-	-	-	-	-	-	-	-	-	-	-
Total Current Liabilities	-	2,477,170	2,965,635	3,531,256	4,185,613	4,942,077	5,816,111	6,825,626	7,954,200	8,830,350	8,736,549
<i>Other liabilities</i>											
Project Loan	42,649,500	42,649,500	40,996,567	38,930,402	36,347,694	33,119,310	29,083,830	24,039,480	17,734,043	9,852,246	-
Working Capital Loan	3,871,904	3,570,832	3,265,996	2,957,349	2,644,844	2,328,433	2,008,067	1,683,696	1,355,271	1,022,740	686,053
Total Long Term Liabilities	46,521,404	46,220,332	44,262,563	41,887,751	38,992,539	35,447,744	31,091,897	25,723,177	19,089,314	10,874,986	686,053
<i>Shareholders' equity</i>											
Paid-up capital	46,521,404	46,521,404	46,521,404	46,521,404	46,521,404	46,521,404	46,521,404	46,521,404	46,521,404	46,521,404	46,521,404
Retained earnings	-	30,142,518	67,166,560	116,794,080	180,196,690	259,319,781	356,503,061	474,272,039	615,197,089	771,917,079	933,382,088
Total Equity	46,521,404	76,663,922	113,687,965	163,315,484	226,718,094	305,841,186	403,024,466	520,793,443	661,718,494	818,438,484	979,903,493
TOTAL CAPITAL AND LIABILITIES	#####	125,361,424	160,916,162	208,734,491	269,896,246	346,231,006	439,932,474	553,342,246	688,762,007	838,143,820	989,326,095

12.3) Cash Flow Statement

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Operating Activities											
Net profit	-	59,727,420	78,823,568	100,991,307	126,451,048	155,689,620	189,318,041	227,819,998	271,951,310	301,000,621	333,038,235
Add: depreciation and amortization expense	-	9,676,100	8,359,060	7,232,139	6,266,211	5,436,989	4,624,123	4,010,498	3,481,675	3,025,429	2,631,390
Accounts receivable	-	(11,881,302)	(1,138,625)	(2,445,568)	(2,804,482)	(3,210,724)	(3,670,169)	(4,189,396)	(4,775,766)	(4,376,324)	(3,849,235)
Finished goods inventory	-	-	-	-	-	-	-	-	-	-	-
Equipment inventory	(143,000)	(30,030)	(36,336)	(43,967)	(53,200)	(64,372)	(77,890)	(94,247)	(114,039)	(137,987)	795,068
Raw material inventory	(2,600,770)	(498,481)	(939,311)	(1,197,145)	(1,521,845)	(1,930,126)	(2,442,771)	(3,085,608)	(2,985,372)	(3,612,300)	20,813,728
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Accounts payable	-	2,477,170	488,465	565,621	654,357	756,464	874,034	1,009,515	1,128,574	876,150	(93,801)
Cash provided by operations	(2,743,770)	59,470,877	85,556,820	105,102,387	128,992,089	156,677,851	188,625,368	225,470,761	268,686,382	296,775,590	353,335,385
Financing Activities											
Project Loan - principal repayment	-	-	(1,652,933)	(2,066,166)	(2,582,707)	(3,228,384)	(4,035,480)	(5,044,350)	(6,305,437)	(7,881,797)	(9,852,246)
Working Capital Loan - principal repayment	-	(301,073)	(304,836)	(308,647)	(312,505)	(316,411)	(320,366)	(324,371)	(328,425)	(332,531)	(336,687)
Bank overdraft repayment	-	-	-	-	-	-	-	-	-	-	-
Additions to Project Loan	42,649,500	-	-	-	-	-	-	-	-	-	-
Additions to Working Capital Loan	3,871,904	-	-	-	-	-	-	-	-	-	-
Issuance of shares	46,521,404	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financing activities	93,042,809	(301,073)	(1,957,769)	(2,374,812)	(2,895,212)	(3,544,795)	(4,355,846)	(5,368,721)	(6,633,863)	(8,214,328)	(10,188,933)
Investing Activities											
Capital expenditure	(85,299,000)	-	-	-	-	-	-	-	-	-	-
Cash (used for) / provided by investing activities	(85,299,000)	-	-	-	-	-	-	-	-	-	-
Net Cash	5,000,039	59,169,805	83,599,052	102,727,574	126,096,877	153,133,056	184,269,522	220,102,040	262,052,519	288,561,262	343,146,451
Cash balance brought forward	-	5,000,039	34,584,942	76,384,467	127,748,255	190,796,693	267,363,221	359,497,982	469,549,002	600,575,262	744,855,893
NET CASH (available for appropriation)	5,000,039	34,584,942	76,384,467	127,748,255	190,796,693	267,363,221	359,497,982	469,549,002	600,575,262	744,855,893	916,429,118
CASH CARRIED FORWARD	5,000,039	34,584,942	76,384,467	127,748,255	190,796,693	267,363,221	359,497,982	469,549,002	600,575,262	744,855,893	916,429,118

13. KEY ASSUMPTIONS

13.1) Operating Cost Assumptions

Description	Details
Hours Operational Per Day	22
Days Operational Per Month	30
Days Operational Per Year	330
Operating Cost Growth Rate (per annum)	10%

13.2) Production Cost Assumptions

Description	Details
COGS Annual Growth Rate	10%

13.3) Revenue Assumptions

Description	Details
Sales Price Growth Rate	10%
Maximum Capacity Utilization	95%
Initial Capacity Utilization	60%

13.4) Economy Related Assumptions

Description	Details
Inflation Rate	10%
Electricity Price Growth Rate	10%
Wage Growth Rate	10%