PROJECT REPORT

Of

GLASS RECYCLING

PURPOSE OF THE DOCUMENT

This particular pre-feasibility is regarding Glass recycling Manufacturing unit.

The objective of the pre-feasibility report is primarily to facilitate potential entrepreneurs in project identification for investment and in order to serve his objective; the document covers various aspects of the project concept development, start-up, marketing, finance and management.

[We can modify the project capacity and project cost as per your requirement. We can also prepare project report on any subject as per your requirement.]

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PROJECT AT GLANCE

1	**Name of Proprietor/Director**	XXXXXXXX	
2	**Firm Name**	XXXXXXXX	
3	**Registered Address**	XXXXXXXX	
4	**Nature of Activity**	XXXXXXXX	
5	**Category of Applicant**	XXXXXXXX	
6	**Location of Unit**	XXXXXXXX	
7	**Cost of Project**	13.88	Rs. In Lakhs
8	**Means of Finance**		
i)	**Own Contribution**	1.39	Rs. In Lakhs
ii)	**Term Loan**	8.10	Rs. In Lakhs
iii)	**Working Capital**	4.39	Rs. In Lakhs
9	**Debt Service Coverage Ratio**	4.11	
10	**Break Even Point**	37%	
11	**Power Requiremnet**	25	KW
12	**Employment**	10	Persons
13	**Major Raw Materials**	Waste glass material,coloring agent and packing material	

14 Details of Cost of Project & Means of Finance

Cost of Project **Amount in Lacs**

Particulars	Amount
Land and building	Owned/Leased
Plant & Machinery	7.50
Furniture & Fixture	-
Other Misc Assets	1.50
Working Capital Requirement	4.88
Total	**13.88**

Means of Finance

Particulars	Amount
Own Contribution	1.39
Term Loan	8.10
Working capital Loan	4.39
Total	**13.88**

1. INTRODUCTION

Glass recycling is the processing of waste glass into usable products. Glass can be recycled in major three forms; cullet, crushed glass, and glass powder. Glass that is squashed or imploded and prepared to be remelted is called cullet. There are two sorts of cullet: internal and external. Internal cullet is made out of blemished products detected and dismissed by a quality control process during the industrial process of glass manufacturing, transition phases of product changes (such as thickness and color changes), and production offcuts. External cullet is waste glass that has been collected or reprocessed with the purpose of recycling. External cullet is classified as waste. Cullet provides many benefits to glass manufacturing. Cullet permits glass producers to lessen their requirement for raw materials. The key ingredients used in glassmaking are sand, sodium carbonate, and limestone. One kilogram of cullet can supplant 1.2 kg of key raw materials. Glass is great for reusing since none of the material is debased by ordinary use. Glass powder is waste material and it becomes granulated by sieving through sieves after they are crushed in the breaker and processed. It is utilized for surface treatment by impacting, reinforcing synthetic resins, and pathlines. Glass recycling helps the environment. The amount of energy needed to melt recycled glass is considerably less than that required to melt raw materials to make new bottles and jars. Also, processing and using recycled glass in manufacturing conserves raw materials.

2 PRODUCT DESCRIPTION

2.1 PRODUCT USES

Recycled glass is used for non-container glass products. These secondary uses for recycled container glass can include tile, filtration, sandblasting, concrete pavements, and parking lots. The sand produced from crushed glass bottles is stronger than the ordinary sand used in construction because of its high silica content. It has 76 percent Silica, therefore, holds better with bricks and concrete. The sand produced from recycled glass is useful for the construction industry. The glass industry regularly mixes cullet, a granular material made by crushing bottles and jars usually collected from recycling programs with sand, limestone, and other raw materials to produce the molten glass needed to manufacture new bottles and jars. Glass culet is used as Filler in paint and plastic, Hydroponic rooting medium, Adsorbent (an alternative to natural clays and zeolites, fly ash – calcium silicate hydrate).

2.2 MANUFACTURING PROCESS

This process can be broken down into the following steps-

Raw material procurement

Recycling Process

Testing

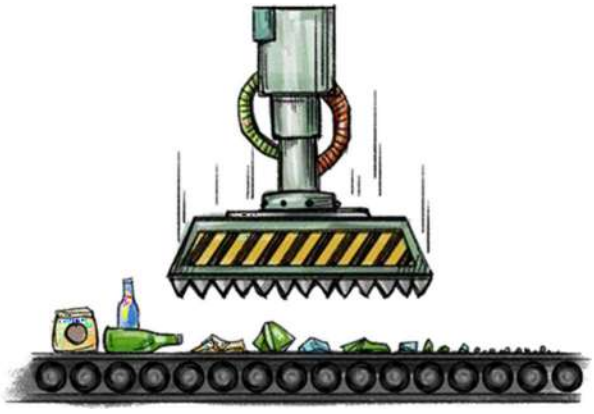
Raw Material Procurement

After collecting waste glass, All loads are carefully inspected for contamination and hazardous materials. Picking up the glass is just the start. The vendor has to bring it back to the sorting yard and segregate it. Then have to take the sorted material to a glass recycling plant to make new products. Sorting of raw material will be done. The material will be handled carefully and will be stored for further operation.

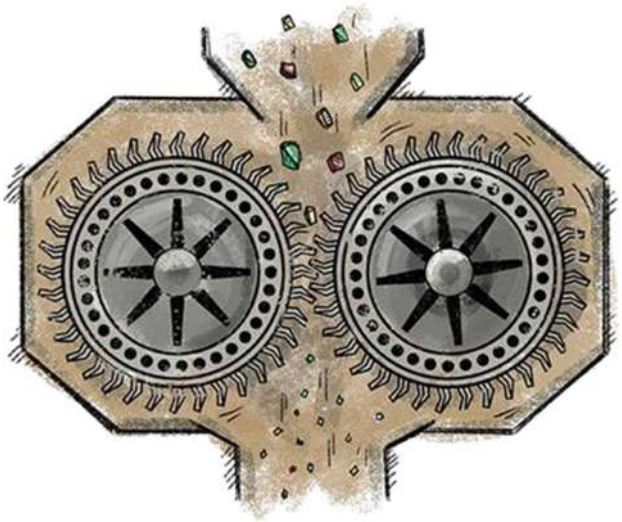
Recycling Process

1) **Waste glass sorting:** Different types of glasses are prepared by the addition of different chemicals and slight variations in manufacturing processes. Because of this, glass waste is sorted based on its color to increase recycling efficiency. This process can be done manually at starting.

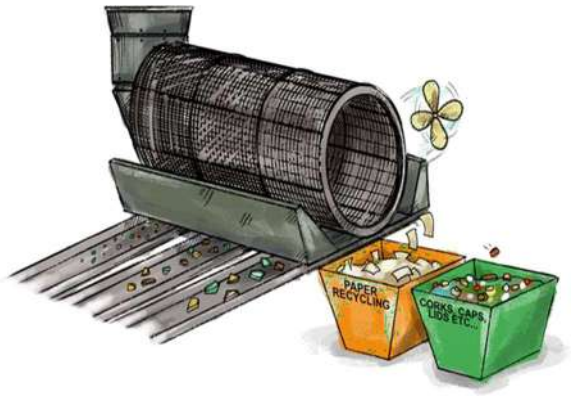
2) **Crushing:** Procured raw material will be crushed using a jaw crusher or roll crusher.

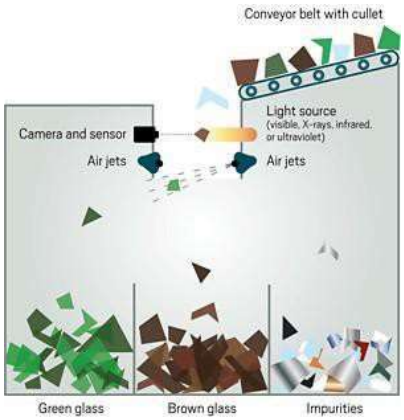


3) **Milling/ Cullet Production:** In the glass crushing line, crushed glass material will be fed into the feeder hopper, which will take the glass onto the conveyor belt; the conveyor belt takes the material up into a hammer mill. Broken glass particles are passed through a revolving screen and sorted into 3/8" and 3/4" sizes. Fans propel the paper labels detached during breaking through the trommel and into a paper recycling bin. Items that don't shatter and cannot fit through the screens (corks, caps, lids, errant labels) are collected and recycled. Once the waste glass is sorted, it is then turned into culets using crushing and grinding. Culets can form of different sizes depending on the requirements. Glass particles that are too big to fit through the primary screen are sent through the pulverizer. Similar to the breaker, the pulverizer uses 36 hammers inside a small enclosure to aggressively reduce particles size. All particles recirculate until they finally pass through the primary screen.

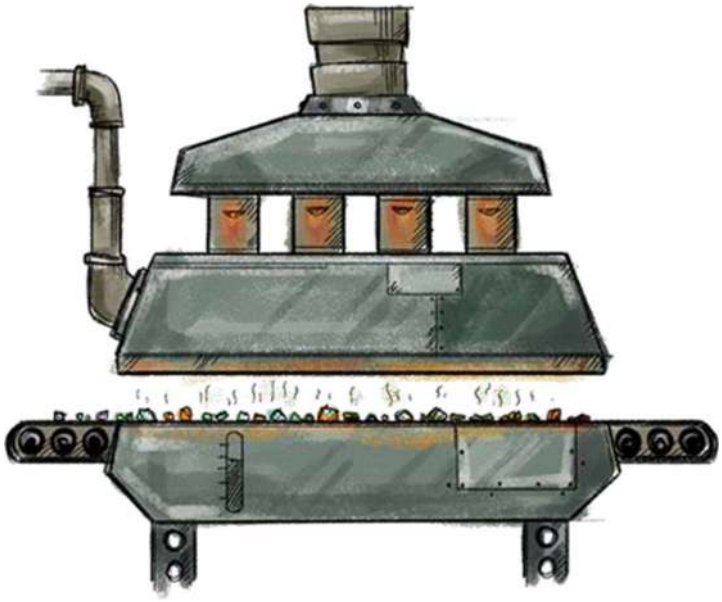


4) **De-Contamination Process**: While milling the material comes under a magnetic cross belt that will pull out any steel or lids or bottle caps into the bin. Magnets and metal separators remove caps, closures, and other metal pieces from the material flow. Using cameras, the glass sorting systems also identify and eliminate foreign materials, such as ceramics, stones, and porcelain. Paper and plastic contaminants are picked up manually or through an automated process.

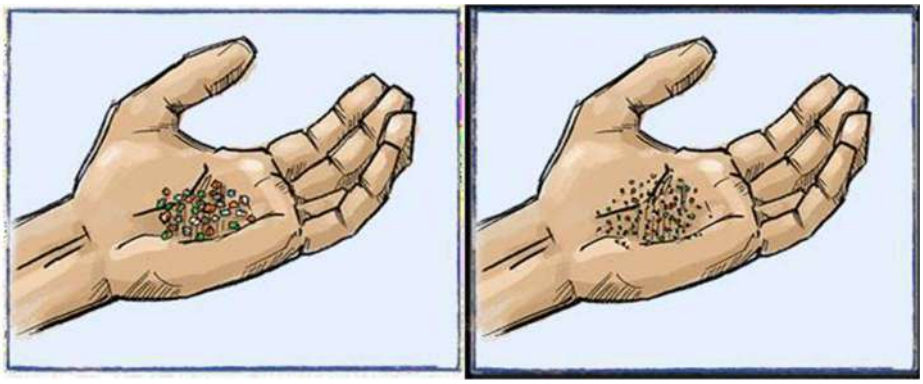




5) **Fluidized Bed Drying** (Optional): A smooth ribbon of glass particles enters the drier in a 4" bed. Vibratory action moves the particles through the drier. Air is heated to 190 degrees F, using natural gas, and forced through the bed of the drier. Think air hockey. Sugars and bacteria are burned and label glue is loosened. Residue floats to the top and is sucked away via our vacuum system.



6. **Collecting final product:** Glass is screened to cull out specific sizes. Screens are quickly changed to produce different size grades for different customers. For example, fiberglass manufacturing requires all particles to be 12 mesh or smaller. Then through the mesh screen, the crushed glass will come up to another conveyor and into a bin or container as a finished product. Glass cullet is classified in sizes that can range from pebbles to sand and even powder. The final product can be a cullet or fine powder.



7. Packing: By fully automatic machine the product will be weighted and will be packed and shipped to make recycled glass products or to end-users

Material feeding and crushing

Milling

Sorting

Final product

Testing

Quality control

3 PROJECT COMPONENTS

3.1 Land & Building

The land required for this manufacturing unit will be approx. around 2000 square feet. Land Purchase and Building Civil Work Cost have not been considered as part of the cost of project. It is expected that the premises will be on rental and approximate rentals assumed of the same will be Rs.20,000 per month.

Workshop Area- This area includes the setup and foundation space for all equipment's,work floor area, etc. Total workshop area is approx.1000 Sqft.

- Inventory Area- This area includes the storage space for all the raw materials and finished goods. Total inventory area is approx. 500 Sqft.
- Office Area – This space includes staff working region, their accommodation space. Total workshop area is approx. 300 Sqft. This may be considered above the ground floor.
- Parking Space, Electric Mounting Space, and Others. This could be approx. 200 Sqft.

Land and building requirement may vary depending on the size of project.

3.2 Plant & Machinery

- **Glass recycling plant:** This glass recycling plant comes with various machines such as jaw crusher, hammer mill, magnetic sorter, storage bins, etc.

  A jaw crusher is used to crush the raw material. In roll or jaw crusher Hollow glass (bottles, jars, syringes, etc.) crushing, can be reduced down to 0-80 mm sizes range. 24 hammers, each the size of a forearm, spin quickly around an axle, breaking the glass into crude particles for future optical sorting.

  A Hammer-mill is used to crush the material as per requirement. The Hammer Mill can be set up to a pre-crash glass or to crush down to very fine sizes, pulverize it. Glass particles that are too big to fit through the primary screen are sent through the pulverizer. Similar to the breaker, the pulverizer uses 36 hammers inside a small enclosure to aggressively reduce particles size. All particles recirculate until they finally pass through the primary screen.

3.2.1 A magnetic sorter is used to sort or remove any foreign material from glass. Magnets and metal separators remove caps, closures, and other metal pieces from the material flow. Using cameras, the glass sorting systems also identify and eliminate foreign materials, such as ceramics, stones, and porcelain.

3.2.2 Storage bins are used to store metal parts and glass parts separately

- **Packing machine:** A bagging machine can be used to pack the finished product.

Machine	Quantity	Price
Glass recycling plant	1	5,00,000
Packing machine	1	2,50,000
TOTAL		**7,50,000**

Note: Total Machinery cost shall be Rs 7.50 lakhs (Approx.) excluding GST and Transportation Cost.

4 LICENSE & APPROVALS

Basic registration required in this project:

- MSME Udyam registration
- GST registration
- NOC for fire safety board and from Pollution Control Board
- Trade License
- Factory License (Optional)
- BIS certification
- Choice of a Brand Name of the product and secure the name with Trademark if required.

Projected Profitability

PROJECTED PROFITABILITY STATEMENT					(in Lacs)
PARTICULARS	**1st year**	**2nd year**	**3rd year**	**4th year**	**5th year**
Capacity Utilisation %	**55%**	**60%**	**65%**	**70%**	**75%**
SALES					
Gross Sale					
Potato Powder	63.80	76.11	87.14	98.88	111.35
Total	**63.80**	**76.11**	**87.14**	**98.88**	**111.35**
COST OF SALES					
Raw Material Consumed	36.96	41.76	46.80	53.76	61.20
Electricity Expenses	2.64	2.88	3.12	3.36	3.60
Depreciation	1.35	1.15	0.98	0.83	0.70
Wages & labour	8.28	10.35	12.94	14.23	15.37
Repair & maintenance	0.77	0.91	1.05	1.19	1.34
Packaging	0.64	0.76	0.87	0.99	1.11
Cost of Production	50.63	57.81	65.75	74.36	83.32
Add: Opening Stock	-	1.69	1.93	2.19	2.48
Less: Closing Stock	1.69	1.93	2.19	2.48	2.78
Cost of Sales	48.95	57.57	65.49	74.07	83.03
GROSS PROFIT	**14.85**	**18.54**	**21.65**	**24.82**	**28.33**
	23.28%	**24.35%**	**24.85%**	**25.10%**	**25.44%**
Salary to Staff	5.40	6.91	8.43	9.44	10.86
Interest on Term Loan	0.80	0.70	0.50	0.31	0.11
Interest on working Capital	0.48	0.48	0.48	0.48	0.48
Rent	2.40	2.76	3.17	3.65	4.20
Selling & Administrative Exp.	0.77	1.52	1.74	1.98	2.23
TOTAL	**9.84**	**12.38**	**14.34**	**15.86**	**17.88**
NET PROFIT	5.01	6.16	7.32	8.95	10.45
	7.85%	**8.09%**	**8.40%**	**9.06%**	**9.39%**
Taxation	0.00	0.24	0.48	0.95	0.45
PROFIT (After Tax)	5.01	5.92	6.83	8.01	10.00

Projected Balance Sheet

PROJECTED BALANCE SHEET					(in Lacs)
PARTICULARS	**1st year**	**2nd year**	**3rd year**	**4th year**	**5th year**
Liabilities					
Capital					
Opening balance		3.20	5.11	6.85	8.75
Add:- Own Capital	1.39				
Add:- Retained Profit	5.01	5.92	6.83	8.01	10.00
Less:- Drawings	3.20	4.00	5.10	6.10	7.60
Closing Balance	**3.20**	**5.11**	**6.85**	**8.75**	**11.15**
Term Loan	7.20	5.40	3.60	1.80	-
Working Capital Limit	4.39	4.39	4.39	4.39	4.39
Sundry Creditors	1.23	1.39	1.56	1.79	2.04
Provisions & Other Liability	0.40	0.48	0.58	0.80	0.96
TOTAL :	**16.42**	**16.77**	**16.97**	**17.53**	**18.54**
Assets					
Fixed Assets (Gross)	9.00	9.00	9.00	9.00	9.00
Gross Dep.	1.35	2.50	3.47	4.30	5.01
Net Fixed Assets	**7.65**	**6.50**	**5.53**	**4.70**	**3.99**
Current Assets					
Sundry Debtors	3.19	3.81	4.36	4.94	5.57
Stock in Hand	2.92	3.32	3.75	4.27	4.82
Cash and Bank	0.16	0.15	0.14	0.12	0.16
Loans & Advances /Other Current Assets	2.50	3.00	3.20	3.50	4.00
TOTAL :	**16.42**	**16.77**	**16.97**	**17.53**	**18.54**

Projected Cash Flow Statement

PROJECTED CASH FLOW STATEMENT					**(in Lacs)**
PARTICULARS	**1st year**	**2nd year**	**3rd year**	**4th year**	**5th year**
SOURCES OF FUND					
Own Margin	1.39				
Net Profit	5.01	6.16	7.32	8.95	10.45
Depreciation & Exp. W/off	1.35	1.15	0.98	0.83	0.70
Increase in Cash Credit	4.39	-	-	-	-
Increase In Term Loan	8.10	-	-	-	-
Increase in Creditors	1.23	0.16	0.17	0.23	0.25
Increase in Provisions & Oth labilities	0.40	0.08	0.10	0.22	0.16
	-				
TOTAL :	**21.87**	**7.54**	**8.55**	**10.24**	**11.56**
APPLICATION OF FUND					
Increase in Fixed Assets	9.00				
Increase in Stock	2.92	0.40	0.43	0.52	0.55
Increase in Debtors	3.19	0.62	0.55	0.59	0.62
Repayment of Term Loan	0.90	1.80	1.80	1.80	1.80
Loans & Advances /Other Current Assets	2.50	0.50	0.20	0.30	0.50
Drawings	3.20	4.00	5.10	6.10	7.60
Taxation	0.00	0.24	0.48	0.95	0.45
TOTAL :	**21.71**	**7.56**	**8.57**	**10.25**	**11.52**
Opening Cash & Bank Balance	-	0.16	0.15	0.14	0.12
Add : Surplus	0.16	(0.01)	(0.01)	(0.01)	0.04
Closing Cash & Bank Balance	**0.16**	**0.15**	**0.14**	**0.12**	**0.16**

DSCR

CALCULATION OF D.S.C.R					
PARTICULARS	**1st year**	**2nd year**	**3rd year**	**4th year**	**5th year**
CASH ACCRUALS	6.36	7.06	7.81	8.84	10.70
Interest on Term Loan	0.80	0.70	0.50	0.31	0.11
Total	7.15	7.77	8.31	9.14	10.81
REPAYMENT					
Instalment of Term Loan	0.90	1.80	1.80	1.80	1.80
Interest on Term Loan	0.80	0.70	0.50	0.31	0.11
Total	1.70	2.50	2.30	2.11	1.91
DEBT SERVICE COVERAGE RATIO	**4.22**	**3.10**	**3.61**	**4.34**	**5.67**
AVERAGE D.S.C.R.					**4.11**

Repayment schedule

REPAYMENT SCHEDULE OF TERM LOAN							
					Interest		11.00%
Year	**Particulars**	**Amount**	**Addition**	**Total**	**Interest**	**Repayment**	**Closing Balance**
1st	Opening Balance						
	1st month	-	8.10	8.10	-	-	8.10
	2nd month	8.10	-	8.10	0.07	-	8.10
	3rd month	8.10	-	8.10	0.07	-	8.10
	4th month	8.10	-	8.10	0.07		8.10
	5th month	8.10	-	8.10	0.07		8.10
	6th month	8.10	-	8.10	0.07		8.10
	7th month	8.10	-	8.10	0.07	0.15	7.95
	8th month	7.95	-	7.95	0.07	0.15	7.80
	9th month	7.80	-	7.80	0.07	0.15	7.65
	10th month	7.65	-	7.65	0.07	0.15	7.50
	11th month	7.50	-	7.50	0.07	0.15	7.35
	12th month	7.35	-	7.35	0.07	0.15	7.20
					0.80	**0.90**	
2nd	Opening Balance						
	1st month	7.20	-	7.20	0.07	0.15	7.05
	2nd month	7.05	-	7.05	0.06	0.15	6.90
	3rd month	6.90	-	6.90	0.06	0.15	6.75
	4th month	6.75	-	6.75	0.06	0.15	6.60
	5th month	6.60	-	6.60	0.06	0.15	6.45
	6th month	6.45	-	6.45	0.06	0.15	6.30

	7th month	6.30	-	6.30	0.06	0.15	6.15
	8th month	6.15	-	6.15	0.06	0.15	6.00
	9th month	6.00	-	6.00	0.05	0.15	5.85
	10th month	5.85	-	5.85	0.05	0.15	5.70
	11th month	5.70	-	5.70	0.05	0.15	5.55
	12th month	5.55	-	5.55	0.05	0.15	5.40
					0.70	**1.80**	
3rd	Opening Balance						
	1st month	5.40	-	5.40	0.05	0.15	5.25
	2nd month	5.25	-	5.25	0.05	0.15	5.10
	3rd month	5.10	-	5.10	0.05	0.15	4.95
	4th month	4.95	-	4.95	0.05	0.15	4.80
	5th month	4.80	-	4.80	0.04	0.15	4.65
	6th month	4.65	-	4.65	0.04	0.15	4.50
	7th month	4.50	-	4.50	0.04	0.15	4.35
	8th month	4.35	-	4.35	0.04	0.15	4.20
	9th month	4.20	-	4.20	0.04	0.15	4.05
	10th month	4.05	-	4.05	0.04	0.15	3.90
	11th month	3.90	-	3.90	0.04	0.15	3.75
	12th month	3.75	-	3.75	0.03	0.15	3.60
					0.50	**1.80**	
4th	Opening Balance						
	1st month	3.60	-	3.60	0.03	0.15	3.45
	2nd month	3.45	-	3.45	0.03	0.15	3.30
	3rd month	3.30	-	3.30	0.03	0.15	3.15

	4th month	3.15	-	3.15	0.03	0.15	3.00
	5th month	3.00	-	3.00	0.03	0.15	2.85
	6th month	2.85	-	2.85	0.03	0.15	2.70
	7th month	2.70	-	2.70	0.02	0.15	2.55
	8th month	2.55	-	2.55	0.02	0.15	2.40
	9th month	2.40	-	2.40	0.02	0.15	2.25
	10th month	2.25	-	2.25	0.02	0.15	2.10
	11th month	2.10	-	2.10	0.02	0.15	1.95
	12th month	1.95	-	1.95	0.02	0.15	1.80
					0.31	**1.80**	
5th	Opening Balance						
	1st month	1.80	-	1.80	0.02	0.15	1.65
	2nd month	1.65	-	1.65	0.02	0.15	1.50
	3rd month	1.50	-	1.50	0.01	0.15	1.35
	4th month	1.35	-	1.35	0.01	0.15	1.20
	5th month	1.20	-	1.20	0.01	0.15	1.05
	6th month	1.05	-	1.05	0.01	0.15	0.90
	7th month	0.90	-	0.90	0.01	0.15	0.75
	8th month	0.75	-	0.75	0.01	0.15	0.60
	9th month	0.60	-	0.60	0.01	0.15	0.45
	10th month	0.45	-	0.45	0.00	0.15	0.30
	11th month	0.30	-	0.30	0.00	0.15	0.15
	12th month	0.15	-	0.15	0.00	0.15	-
					0.11	**1.80**	

DOOR TO DOOR	60	MONTHS
MORATORIUM PERIOD	6	MONTHS
REPAYMENT PERIOD	54	MONTHS

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