

Brief Write up SUMUL Surat

(i) Unit Profile :

Surat District Co-operative Milk Producer's Union Ltd, abbreviated as "**SUMUL**" situated in Surat City and it is very near to Surat Railway station. Surat is very well known for Textile and Diamond business but at the same time it is also well known for Co-operative organizations which are originated first in India. This organization is established with clear and broad objectives and registered under Bombay State co-operative society act VII vide registration NO.PD/688 OF 22nd August 1951. When Sumul came into existence, middleman were exploiting both milk producers as well as consumers. Sumul started this business with following objectives.

- (1) To provide year round milk market for their surplus milk and to earn reasonable returns for the milk to improve their quality of life.
- (2) To procure milk and process it into good quality milk and milk products to market it at most economically and efficiently to give maximum overall net returns to the producers and general satisfaction to the consumers.
- (3) To provide essential technical inputs and services to the producers at their door steps in an economic and efficient manner and also in a way most acceptable to them to increase milk production and to reduce the cost of production.

Sumul is in business of procuring the milk, processing the milk, manufacturing milk products and distribution of milk and milk products in Surat district under brand name "Sumul ". Sumul is a member union of Gujarat Co-operative Milk Marketing Federation Ltd. Anand and manufactures milk products under brand name Amul for Gujarat Co-operative milk marketing Federation LTD, Anand. Sumul is also ISO –9002, HACCP and ISO –14001 Certified organization. We are certified from Export council of India, which will help in improvement and export of surplus milk and milk product.

Sumul procures milk through well-established procurement network having 1006 village milk co-operative societies in connection of 2,17,615 producer members. The major milk collection is done from poor and marginal tribal farmers who are totally dependent on dairy husbandry and among them Sumul has establish its name as "Kamdhenu". Sumul is not only procuring milk but it has taken the responsibility of improving the quality of life of tribal people by providing remunerative prices to their milk through out the year. Providing input and veterinary services at subsidized rate and extension services and by implementing rural sanitation programs. It organizes so many developmental programs along with Government, Non Government, UNICEF, G.C.M.M.F. Ltd, and N.D.D.B. at village for the development of rural life through a co-operative net work. Sumul's main business is to meet the demand of liquid milk of Surat City first. It has 1850 dedicated distribution Agents appointed by Sumul to sale only Sumul milk. Milk is sold through appointed authorized Agents only while milk products are distribution through distributors appointed by Sumul. Sumul has 69 % market share in liquid milk over all and 90 % market share in packed milk.

Name of Product	Pouches
Pasteurized standardized Milk	500 ML , 5 Litres
Sumulya High Fat Milk	500 ML , 5 Litres
Delite Homogenized Toned Milk	200 ML, 500 ML
Skimmed Milk	5 Litres
Butter Milk	500 ML

The basic requirement of customer of milk is it should be available in time in the market as per convenience of the consumers. Sumul delivering milk in market four times in a day to meet the requirement of each type of customer. Milk should not be curdled when consumer's use it is the prime requirement and it should meet the

standards also.

Sumul is also manufacturing and marketing indigenous products like shrikhand, Sweets, penda, paneer, Ghari, Flavored milk, Ghee, Masala chhas, Yoghurt (Masti Dahi). Sumul products are well accepted by the consumers. Sumul is also manufacturing milk powder, table butter and ghee under “ Amul Brand” and marketed through GCCMF limited.

Sumul is well structured as far as employees base is concern total 892 no of employees for managing various activities of Sumul has highly qualified staff on its role.

Organisation Employee Strength Details

Post	No	Post	No	Post	No
Managing Director	01	SR. Exe. /Executive officer	75	Work man Grade- 1	49
Manager	12	SR./JR. Executives	81	Work man Grade- 2	300
Deputy Manager	01	SR./JR. Assistant /Technician Grade-1	189	Work man Grade- 3	113
Assistant Manager	10	Technician Grade II	45		

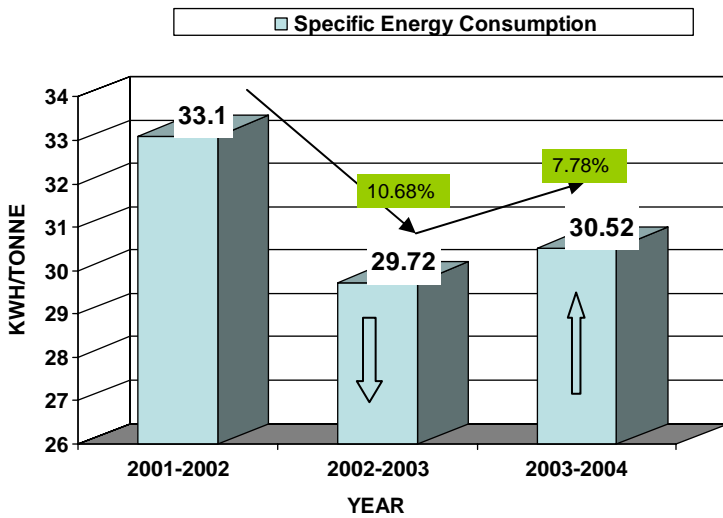
(ii) Energy Consumption :

There is a steady decline of specific energy conservation due to implementation of various energy conservation measures in last 3 years. The details are as given below :

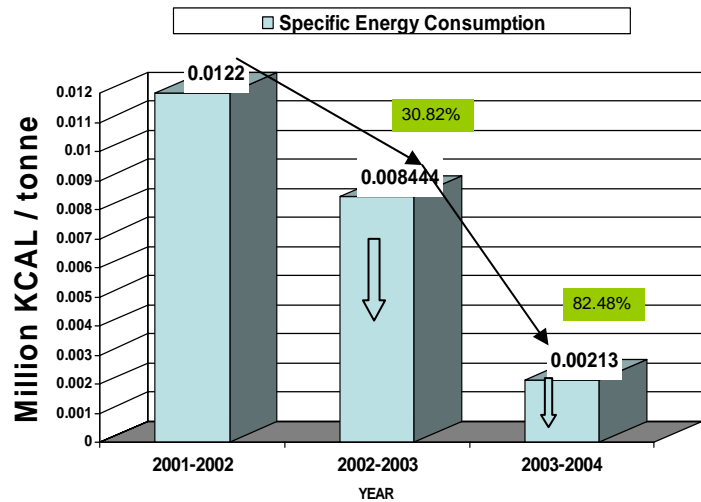
DESCRIPTION	UNIT	2001-2002	2002-03	2003-04
ANNUAL MILK & MILK PRODUCTION	MT	229685.6	261705.52	266668.08
TOTAL ELECTRICITY CONSUMPTION/ ANNUM	LAKHS KWH	76.027	77.775	81.396
SPECIFIC ENERGY CONSUMPTION	KWH/MT	34.10	29.72	30.52
TOTAL THERMAL ENERGY CONSUMPTION / ANNUM	MILLION KCAL	2803.55	2209.73	570.24
SPECIFIC ENERGY CONSUMPTION – THERMAL	MILLION KCAL/MT	0.012	0.00844	0.0021
SPECIFIC ENERGY CONSUMPTION- WATER	KL/MT	1.18	0.83	0.83
TOTAL MANUFACTURING COST	LAKHS RS.	37439.74	40707.63	44098.17
TOTAL ENERGY COST	LAKHS RS.	920.70	890.72	913.94
ENERGY COST AS % OF TOTAL MANUFACTURING COST	%	2.46	2.19	2.07

REDUCTION IN SPECIFIC ENERGY CONSUMPTION COMPARED WITH 2001-02

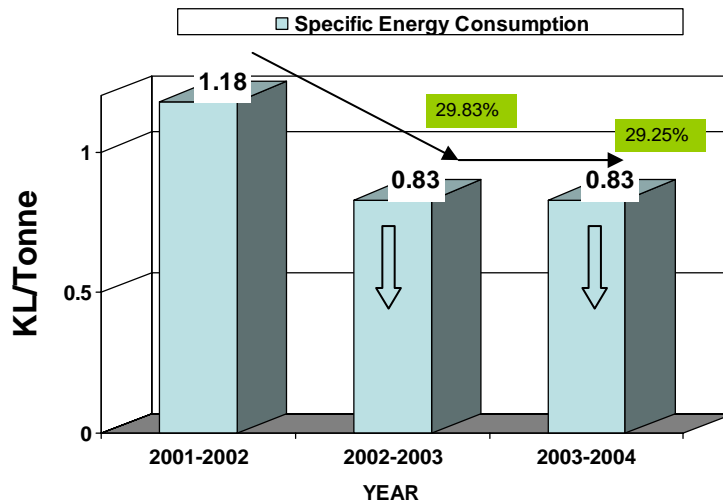
ELECTRICAL



THERMAL



WATER



(iii) Energy Conservation Commitment Policy & Setup : Energy Policy :-

We at Sumul Diary are devoted, dedicated and motivated work force trained to ensure consistent supply of energy efficient utilities to achieve highest level of quality and quantity of Milk and Milk product for our valued customer at national and international level.

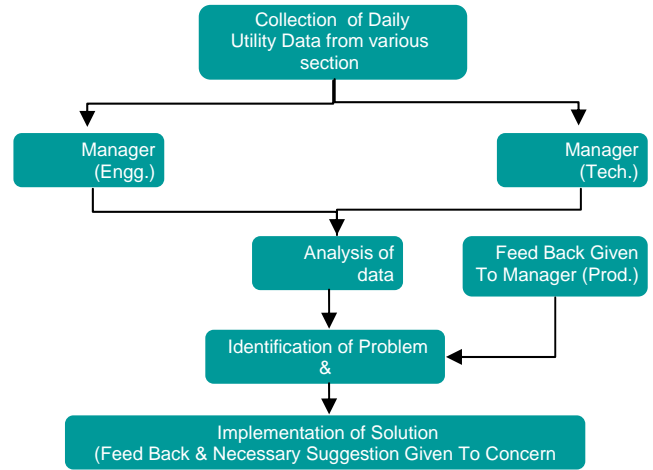
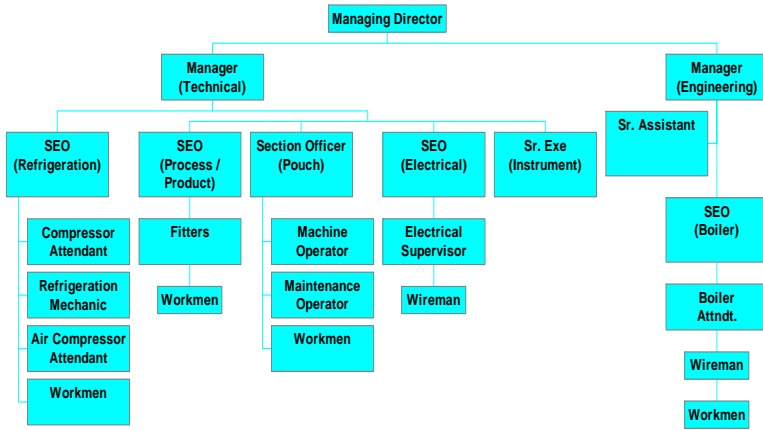
We will achieve this by continuous monitoring and up gradation of procedures and processes applying scientific innovation and state of the art technology to avoid misuse of energy and remain eco-friendly.

Commitment :

- (1) Understand and meet internal customer needs to support production, process and storage of products.
- (2) Develop competency of employees for continual improvement of their performance and effectiveness.
- (3) To demonstrate continual improvement of utility processes based on departmental objectives.
- (4) To review the system and consumption trend of energy.

- (5) To apply scientific innovation and the state of the art technologies.
- (6) To achieve and sustain standards of ISO 9000-2000 and ISO-14001.
- (7) To develop awareness of employees for avoiding misuse of any kind of energy.

Energy Management Setup & Communication Channel :



(IV)ENERGY CONSERVATION ACHIEVEMENTS

TREND SETTER

1. REDESIGNING OF GHEE SECTION WITH SPIRAL FLOW GHEE MELTING SYSTEM TO UTILIZE THE CONDENSATE OF GHEE SECTION.

Background

Previously butter was getting melted in the butter melting vat and the condensate was going to drain. The molten fat pumps were running on DOL starters. The stratification tank was conventional and did not have facility to separate butter serum and molten fat as a result of which during manufacturing of ghee lots of heat was required to evaporate the butter serum which resulted in increase in gas consumption. Even the steam pressure for melting Ghee used to be almost 4 kg/cm².

On an average, approximately 8 TPD Ghee was manufactured. Since the system did not have CIP on continuous basis lots of Fat loss used to take place and the ETP load used to get increased. Even for the remaining butter serum we used to operate a churn of 20 HP and used to require cooling water for the same.

As a result of which steam, power consumption and ETP load was much higher.

Current Status

- Spiral flow system installed and put into the operation. The features of the system are as under,
 - a. Energy efficient melting system – spiral flow
 - b. Efficient multiple use – butter pumping system : for uniform flow to melting / packing.
 - c. A flow system easy to control with VFD.
 - d. New designed stratification tanks to separate serum and molten fat.
 - e. Clean operations – reduces load on ETP.
 - f. CIP with product recovery.
 - g. Efficient serum separator.
 - h. Reduced steam consumption.
 - i. Reduces batch time and increase in production due to continuous process.
 - j. Increase productivity – quick cattle cleaning, less SNF – less foaming, fewer residues, less fat losses, recovered serum can be mixed with raw milk / butter milk.

Payback

- Annual Gas savings - SCM 1.22 Lakhs
- Annual Money Saving - Rs 11.00 Lakhs
- Investment - 11.25 Lakhs
- Payback period - 1 Year



2. *INSTALLATION OF 2 NOS PLC BASED POUCH FILLING MACHINES.*

Status

- Pneumatically operated pouch filling machines having air consumption of 35 CFM each were in use for the milk pouch filling.

Observation

- Higher air consumption leading to the higher power consumption through compressor.

Action taken

- PLC Based Mechanical pouch filling machines installed in place of pneumatically operated machines.

Payback

- Annual Energy saving - 1.168 Lakhs kwh
- Annual Money saving - 5.84 Lakhs
- Investment - 7.40 lakhs
- Payback - 15 Months



3. *PANEER WHEY UTILIZATION IN BUTTERMILK.*

Status

- Previously whey was drained.

Observation

- Higher ETP load,
COD - 3929 mg / ltr @ of daily paneer whey generation 4200 ltrs. Total COD load at inlet of ETP 252 kg/day
- Total solid loss – 7501 mg / ltr

Action taken

- Lab analysis done and decided after trials it was decided to add paneer whey in to butter milk @ 10% of the total butter milk quantity.
- Daily approximately 4200ltrs. Whey utilized into Buttermilk, it has contains total solids of fat % that costs around Rs. 5.5 /ltrs. When utilized into paneer whey.
- COD load now was reduced from 3929 mg / ltr to 3183 mg / ltr.
- Total solid loss now was reduced from 7501 mg to 6076 mg / ltr

Payback

- | | |
|---------------------|---------------|
| Annual Money saving | - 83.12 lakhs |
| Investment | - 0.4 lakhs |
| Payback | - 6 days |



4. ENERGY EFFICIENT PASTEURIZER (PLATE HEAT EXCHANGER) WITH 93% REGENERATION.

Status:

- Milk pasteurizer having capacity 30,000 LPH was installed.

Observations:

- Low Regeneration efficiency (90% regeneration efficiency).
- Higher Coli form bacteria content.
- Higher steam and chilled water requirements.

Action taken:

- Pasteurizer was replaced by a new pasteurizer having capacity of 30000 LPH and 93% regeneration efficiency.
- Reduction in steam (Gas) consumption – 241.8 Tons / year, Rs 241776 per year and reduction in refrigeration load due to higher regeneration efficiency – TR.

Payback

- Annual Steam (Gas) savings - 365.41 Tons, Rs 3.64 Lakhs
- Annual refrigeration load reduction - 161 Ton / Day, Rs 2.93 Lakhs
- Investment - Rs 13.50 Lakhs
- Payback period - 6 Months



OTHER ACHIEVEMENTS

1. SCADA & PLC BASED PLANT FOR UHT WITH VFD.

Status:

- UHT plant operation was manual.
- Manpower involvement was higher.
- Drive was being operated through DC power.

Observation:

- Higher amp drawing
- Frequent problem with the PCB Card due to the above.
- Tripping of any of the UHT plant equipment usually caused stoppage of supply of milk to the Yogurt Plant, in turn the production was disturbed.

Action taken:

- The complete UHT plant has been atomized with Programmable logic control and SCADA.

Payback

- Annual Energy savings - 42000 kwh,
- Annual Money saving - Rs 2.10 Lakhs
- Investment - Rs. 7.0 Lakhs
- Payback period - 39 Months



2. INSTALLATION OF SOFT STARTER FOR OTHER 3 NOS. HOMOGENIZER.

Status:

- Star delta starters were installed.
- Frequent problem of relay and contactor of starter.

Observations:

- Start up torque was found to be very high – 650 amps.
- Many a times the max current demand was getting crossed due to the higher amp torque.

Action taken:

- Domestic star delta starter replaced by Soft Starter.
- Start up torque reduced drastically – 350 Amps.
- No crossing of Max current demand rendered in avoiding penalty.

Payback

- Annual savings - KWH 0.042 Lakhs
- Annual Money saving - Rs 0.24 Lakhs
- Investment - Rs 5.55 Lakhs
- Payback period - 27.75 Years



3. INSTALLATION OF APFC RELAY IN MCC -3 NOS

Status:

- Capacitor was directly connected to Busbar of Ghee, Butter and APS MCC Panels.
- To maintain the Power Factor with respect to the load was not possible as PF correction relay was not there.

Observation:

- Capacitor drawing high amps due to the above.
- The power consumption during the time when the capacitor is not in use the power consumption by the capacitor itself was higher.

Action taken:

- ⊗ Power Factor correction relay installed in all the three MCC Panels (Ghee section, Butter Section and APS Building)

Payback

- ⊗ Annual Energy savings - 24400 KWH
- ⊗ Annual Money saving - 1.22 Lakhs
- ⊗ Investment - Rs 0.24 Lakhs
- ⊗ Payback period - 2.5 Months



4. DOWN SIZING OF 3.5 HP MOTOR WITH 3 HP MOTOR IN PLANT – 6 NOS.

Status

- ⊗ Pumps of old model with 3.5 HP motor were installed – 6 Nos.

Observation

- ⊗ Pump drawing higher current.

Action taken

- ⊗ IDMC make pumps with 3 HP motor installed.

Payback

- ⊗ Annual energy saving - 17962 KWH (for six pumps)
- ⊗ Annual money saving - 0.89 Lakhs
- ⊗ Investment - Rs 1.44 Lakhs
- ⊗ Payback - 17 Months



5. SMALL TYPE SOFT STARTER FOR BLOWER APPLICATION

Status

- ⊗ Star delta starters were installed.
- ⊗ Frequent problem of relay and contactor of starter.

Observations:

- ⊗ Start up torque was found to be much higher.
- ⊗ Many a times the max current demand was getting crossed due to the higher amp torque.

Action taken:

- ⊗ Domestic star delta starter replaced by Soft Starter.
- ⊗ Start up torque reduced drastically.
- ⊗ No crossing of Max current demand rendered in avoiding penalty.

Payback

- ⊗ Annual Energy saving - 21792.2 KWh
- ⊗ Annual Money saving - Rs 2.01 Lakhs
- ⊗ Investment - Rs 0.17 Lakhs
- ⊗ Payback - 2 Months



6. INSTALLATION OF ELECTRONIC BALLASTS - 40 NOS

Status

- Domestic ballasts were installed.

Observation

- High power consumption.

Action taken

- 40 Nos Domestic ballasts replaced by Electronic ballasts and reduced power consumption.

Payback

- Annual energy saving - 7185.6 KWH
- Annual money saving - 0.3 Lakhs
- Investment - Rs 0.09 Lakhs
- Payback - 4 Months



7. INSTALLATION OF 75 HP VFD FOR CBMM

Status

- There was no VFD installed and the motor was running on domestic Star Delta Starter.

Observation

- Higher power consumption due to abrupt variations in the demand / capacity.

Action taken

- Domestic star delta starter was replaced by VFD.

Payback

- Annual energy saving - KWH 1.233 Lakhs,
- Annual Money saving - Rs 1.52 Lakhs
- Investment - Rs 4.00 Lakhs
- Payback - 2.63 Years



8. DOWN SIZING OF 7.5 HP MOTOR WITH 5 HP MOTOR IN PLANT – 2 NOS

Status

- Pumps of old model with 7.5 HP motor were installed- 2 Nos.

Observation

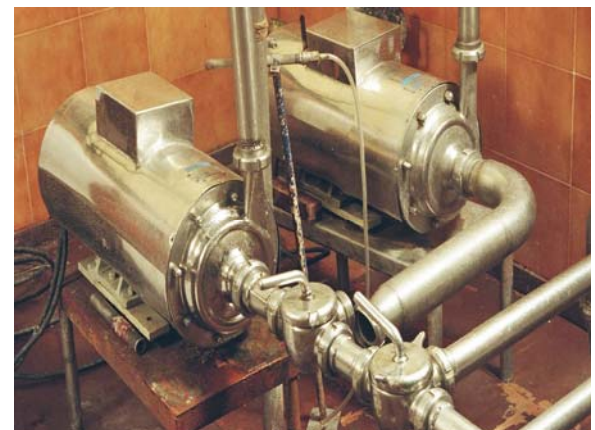
- Pump drawing higher current.

Action taken

- Fristam make pumps with 5 HP motor installed.

Payback

- Annual Energy saving - 7210 KWH (for two pumps),
- Annual Money saving - Rs 0.296 Lakhs
- Investment - Rs 0.678 lakhs
- Payback - 27 Months



(V) ENERGY CONSERVATION PLANS & TARGETS

INSTALLATION AND COMMISSIONING OF CO-GENERATION PLANT 1.2 MW POWER GENERATION CAPACITY

Energy Conservation Measures (Planned)	Anticipated Savings		Approx Investment Rs In Lakhs	Expected completion date	PO No / Date	Payback Period In years
	Energy Value	Rs Lakhs				
Installation and commissioning of 1.2 MW power generator at our Sumul Dairy, Surat.	Please refer the table below	171.00	200.00 (121.45 package value and 78.55 for clearance, taxes duties etc)	31.12.04	PROJECT:IMPOR TED GENERATOR:PR P:05079 Dtd 20.08.2004	1.17

% Ratio	SEC Units Daily	Generator Units Daily	Rate of SEC In Rs	Rate of Generator In Rs	Value for SEC units In Rs	Value of Generator In Rs	Expected saving in Rs for 365 days In Rs	Payback period in years
75	6250	18750	5	2.5	31250	46875	1.71 Cr	1.17

INSTALLATION AND COMMISSIONING OF 1000 KVA DRY TYPE TRANSFORMERS 3 NOS.

Energy Conservation Measures (Planned)	Anticipated Savings		Approx Investment Rs In Lakhs	Expected completion date	PO No / Date	Payback Period In years
	Energy Value In Lakh KWh	Rs Lakhs				
Design, Supply, Installation And Commissioning Of 1000 Kva Dry Type Transformer To Sumul Dairy, Surat	2.44 (3% of the total power consumption)	12.20	31.25	16.01.2005	Project : Dry Type Transformer : Prp: 06 Dtd 23.08.2004	2.5

INSTALLATION AND COMMISSIONING OF AMMONIA PHE FOR CHILLED WATER RETURN, INSTALLATION AND COMMISSIONING OF SCREW COMPRESSORS AND AUTOMATION OF ENTIRE REFRIGERATION SECTION ON PLC AND SCADA BASED.

Energy Conservation Measures (Planned)	Anticipated Savings		Approx Investment Rs In Lakhs	Expected completion date	PO No / Date	Payback Period In years
	Energy Value In Lakh KWh	Rs Lakhs				
Ammonia Screw compressors (2 Nos)	2.24 (7.5% of the total)	11.20	163.00 (Rs 125)	30.11.04	PROJECT/ SCREW	15 Years

having capacity of 200 TR shall replace the existing 5 Nos of reciprocating compressors. Ammonia Plate heat exchanger Chiller with economizer to reduce the temp of return chilled water and in turn decreasing the overall IBT load. Automation of complete refrigeration plant on PLC and SCADA based.	ref plant power consumption)		Lakhs for Mechanical and Rs 38 Lakhs for Automation job)		COMPRESSOR/ PRP/2696 & 1589 Dtd 25.04.2004 & 24.04.2004.	
--	------------------------------	--	--	--	--	--

OTHER PROJECTS

Sr. no.	PLAN	SCHEDULE YEAR	ANNUAL SAVING	
			LAKH KWH	LAKH (RS.)
1	Installation of steam flow meter for monitoring/ controlling of the steam.	2004		
2	Installation of water meters and recording/monitoring / controlling of the same (ORDER PLACED)	2004	2.1kl	0.48
3	Redesigning of ETP to use 100% water for gardening	2004	165000m3	36.5
4	Soft starter for Supply fan in powder plant	2004	15750	0.78
5	Soft starter for Exhaust fan in Powder plant	2004	10125	0.50
6	Installation of VFD for water supply system.	2004	6110	0.3
7	Installation Of VFD for Chilled Water System	2004	6110 -m3	0.5
8	Providing Ammonia PHE for return chilled water to reduce the condenser load	2004		
9	Bio gas production through ETP	2005	124410 m3/y	35.15
10	Automation of process	2006		200
11	Installation of Electronic ballasts –30	2004	17964	0.89
12	Pouch filling machine conversion from Mechanical to PLC based – 7 Nos	2005	408000	20.44

(VI) Environment and Safety:

As per the Environment Policy, SUMUL is committed to continual up gradation of technology, prevention of pollution, conservation & optimum utilization of natural resources by adopting Reduce, Reuse & Recycle methods, training for environmental awareness to employees & suppliers, safe operation of the plant & equipment, complying with all the applicable environmental legislation & regulations to preserve its environment and ensure safety of its employees and further striving to go beyond legal requirements.

WATER:

- Effluent Treatment Plant of 1400m3 / Day.
- Treated water from ETP is used for Gardening.
- Rain Water Harvesting is being implemented.

AIR:

- 2 nos. Stacks for Boiler & 1 no. stack for DG set & 1 no. stack for Hot Air Generator are installed to monitor exhaust of the same.

- Monthly monitoring of stack & Ambient air carried out by M/s. Eco – Chem Sales & Service, Surat.
- Ventilation arrangement provided for improved fresh air circulation in Production area.
- We are using mainly Natural Gas & in absence of that , we are using Furnace Oil in Boiler.
- Flue gas analyser in Boiler to monitor the % of O2 excess air & CO in the Flue gas.

SOLID WASTE:

- Anaerobic Digester system provided for getting Bio – Gas from waste of Ghee – Butter section.
- ETP sludge is dried in Sludge Drying beds & Dried sludge is used as manure in own land.

GREEN BELTING:

- Development of Green belt in and around factory for a total area of 50,000 m².
- Various types of plants and lawns developed around factory to improve the environment.
- Lawn – 11165 m², Small plants – 20,000 nos. Mango– 15, Gulmahor-114, Asopalav-186, Neem- 151, Saru- 562, Almond- 10, Coconut -21, Nilgiri-05 & all other trees – 13. Total-1075

ENVIRONMENT MANAGEMENT SYSTEM:

- EMS activity started & ISO 14001 certification obtained from 15th May, 2002 & valid upto 2005. Periodical External Surveillance audit at certain intervals (Twice in a year) had been carried out by SAI GLOBAL, Australia, for reviewing EMS system is in place . We already pass three of such audits successfully. ,