First Prize *Dairy*

KOLAR-CHIKKABALLAPUR MILK UNION LIMITED

Huthur Post, Kolar (Karnataka)

Unit Profile

Kolar -Chickkaballapur Milk Union is one of the 2 nos largest Dairy Co-op. union in the state of Karnataka, procuring on average 7.15 LKPD milk from the milk shop area. The union establishment during April 1987, with an initial share capital of Rs 8.56 lakhs and milk procurement of 1.51 lakhskgs/day, to day union has shown to have its share capital of Rs 2194.76 lakhs and year average per milk procurement of 6.71 LKPD

KOMUL has the distinctions of establishing wishes no of Bulk Milk coolers in the village DCS and first & only units to have UHT milk processing plant in the state of Karnataka union has one milk processing full -fledged Dairy plant at Kolar and 3 milk chilling centers.

Energy Consumption

Sl no	Particulars	2007-08	2008-09
1.	Product (Milk & Milk product MT/yr)	111881.516	127385.00
Electrical:			
1.	Total Electrical Energy(Lakhs KWH/yr)	40.39	41.34
2.	Total Electrical Energy savings (Lakhs KWH/yr)	2.589	6.7017
3.	Specific Electrical Energy consumption (Lakhs KWH/yr)	0.00036	0.00033
4.	% Of Electrical Energy Savings over previous/ye	-	16.59
Thermal:			
1.	Total thermal Energy (Furnace oil in KL/yr)	545.64	575.43
2.	Total Thermal Energy Savings (in KL/Yr)	72.44	42.285
3.	Speceife Thermal Energy (In MKCAL/yr) 2007-08 (5483.68 Mkcal/product) 2008-09 (5783.07/product)	0.0490	0.0454
4.	% of Thermal Energy Savings over previous year)	-	7.75

Note:- *Though the product handling has increased by 12.17% over the year 2007-08 both the specific Electrical Energy and specific Thermal Energy consumption has decreased.*

Energy Conservation Achievements

Kolar Milk Union was honored by the Bureau of Energy Conservation with certificate of merit during the year 2008. The Management and the staff, enthused by the money saved due to Energy saving during 2008, had lot of interest in further achieving the savings to the organization. All the staff was involved in awareness program **"Energy saved is Money earned".** Following are the major Energy conservation projects taken up during the year 2008-09.

1. Installation of LED solar street light
2. De- Super heater Hot water used for Boiler
3. Reduction of Butter Milk Pump
4. Installation of Electronic ballast
5. Installation of CFL
6. Booster Pump
7. Installation of New 110 TR Vertical Shell & Tube condenser.
8. Stoppage of steam for Two no's Can washers
9. Installation of New Crate Washer
10. Stoppage of steam for Crate Washer
11. Hot water for CIP Tank

12. Thawing of Butter

13. Instillation of Solar Hot water system

Energy Policy

We continuously strive to effectively improve the overall operations and management systems by adapting cost effective advanced technologies and by educating and motivating the workforce to achieve maximized qualitative production with least energy consumption and safeguarding environment and natural resources.

Environment and Safety Policy

- The Management is committed to safeguard the environment and safety of the employees.
- The organization has commitment to protect the Environment, by not disposing the effluents without treatment. As the handling capacity of the unit increased, we have taken up the expansion of ETP. The water treated with ETP has been used to feed our fodder crop plots, not leaving in to the main stream.
- We have also has the plans to go for " Reverse – osmosis" treatment plant for ETP water on "Build- own- operate" basis with some private agencies. With this the ETP water can be used in normal milk processing plants and only the solid waste will be disposed.
- Further to this waste- Management system has been in operation to collect the waste LLDPE film, corrugated boxes, cores, plastic roles etc,. All the waste collected is neatly stored in the designated places and disposed off periodically. Which not only keeps the Dairy premises neat & clean, also earns money to the organization.
- The management is committed for the safety of employees. The fire extinguishers are installed in all important places and staff was trained in using them. The same were recharged every year to keep them in working condition. All the equipments and products were insured for fire and damages.
- The staff have been provided with uniform, shoes, head gears, hand gloves, mouth masks, warm woolen clothes, etc.,
- Installed RO water purifier in key places to provide clean drinking water for the employees.
- Regular medical health checks ups to all employees once in a year.

KAIRA DISTRICT CO-OPERATIVE MILK PRODUCERS' UNION LIMITED

Amul Dairy, Anand (Gujarat)

Unit Profile

Amul was the first Milk Co-operative in India, established in the year 1946. The Co-operative began with 250 litres milk collection per day and is collecting and processing one million litres of milk per day (maximum) in peak season from nearly 1000 villages of Anand and Kaira Districts of Gujarat. The milk producers' owned and managed Co-operative has been provided to be the tool for empowering 500,000 milk producers to adopt modern science and technology, acquire professional expertise to produce, process and market milk and milk products and be the market leader in India.

"Amul Pattern" - a successful model has been replicated not only in India but abroad by the NDDB and FAO to bring about the socio-economic change in rural India.

Energy Conservation Commitment, Policy and Set Up

Amul has made a policy to enhance energy efficiency through involvement and participation of its own employees. It empowers employees to make techno economical decisions, plan for the same and implement through own staff. It encourages employees' participation without the fear of failure and support bold decision making.

Energy Consumption

Energy is an important resource and Amul has always laid emphasis on its optimal Utilization. Even with the modern plant set up in the year 1996, efforts have been continuing to optimally utilize energy, which can be seen from the table below

Description	Units	2007-08	2008-09
Annual turn over	Rs. in Crore	1077.00	1378.00
Annual Milk Procurement	Lakhs kgs.	3179.07	3756.24
Annual Electric Energy Consumed	Lakhs KWH	218.85	243.41
Annual FO Consumed	Kilo Liters	3772.12	4553.64
Annual Gas Consumed	Lakh M^3	88.39	67.04
Annual Elec. Energy cost	Rs. in Lakhs	1014.95	1435.17
Annual Fuel Oil & Gas cost	Rs. in Lakhs	1735.94	1768.99
Total Energy cost	Rs. in Lakhs	2750.89	3204.16
Energy cost per 1000 lit of milk	Rs. /1000 Lit.	865.31	853.02

Annual Energy Savings Achieved in 2008-09 by the Organization

Annual Energy Savings in Rs. Lakhs	One Time Investment in Rs. Lakhs	Electrical Energy Saving in Lakhs kWh	Furnace Oil Savings in Lakhs KL	Coal Savings in Lakh Metric Tonnes	Gas Savings in Lakh Cubic Meters
206.39	162.18	6.62	–	–	7.92

Annual Energy Savings Achieved in 2008-09 by the Departments

Project Description	Annual Energy Savings in Rs. Lakhs	One Time Investment in Rs. Lakhs	Electrical Energy Saving in Lakhs kWh	Furnace Oil Savings in Lakhs KL	Coal Savings in Lakh Metric Tonnes	Gas Savings in Lakh Cubic Meters
High Efficiency Boiler	188.10	140.00	3.96	–	–	7.92
Moisture Free Air Compressor	13.65	19.00	2.10	–	–	–
V.F.D in F-60 VIBRO Ex Fan Motor	2.60	1.92	0.40	–	–	–
V.F.D in F-60 VIBRO Ex Fan Motor	1.04	1.26	0.16	–	–	–
TOTAL	**205.39**	**162.18**	**6.62**			**7.92**
			Fuel Mtoe – 673.00	**=**	**7.92*8500/ 100 = 673**	

Gas Engine

At Amul Dairy Anand natural gas fired power generation unit has been installed. The capacity of this engine is 1365 KW. The exhaust gas generated by this engine is 6500 cu.M per hour at about 95 % average load. The temperature of gas ranges from 525 Deg 'C to 540 Deg 'C. Vapour absorption heat pump to utilize this waste heat for chilling water from 8 Deg 'C to minimum 3.5 Deg 'C. The chilled water utilize at the rate of 175 cu. M About 255 MT refrigeration effect generate.

Vapour Absorption Machine

Vapour absorption system use heat energy to produce a refrigerating effect. In these system the refrigerant i.e. water adsorbs, heat at the low temperature and pressure during evaporation and releases heat at a high temperature and pressure during condensation.

A solution known as absorbent, i.e. Lithium Bromide is use to absorb the vaporized refrigerant. This solution, contain the absorbed vapour is heated at a higher Pressure. The refrigeration vaporized and the solution is resorted to its original concentration for recirculation.

Air Compressor

At Amul Dairy Plant, 3 nos. of 45 KW Atlas Copco make Air compressors were operating to full fill the requirement of Air in various sections. For above air compressors air drier was installed separately and due to water cooled units causes lot of problems for maintenance.

The plant has installed Atlas Copco make new version air cooled air compressor having 90 KW motor with Variable Frequency Drive and integrated Refrigerated air drier. So by operating this air compressor plant had stopped other compressor and average savings was achieved around 25 KW/hr. And also reduced the maintenance and downtime.

High Energy Efficient Boiler

Earlier plant used to operate two boilers for 10 TPH output. Nowadays Plant operate only one new boiler for same output i.e. 10 TPH.

Power Saving

Earlier plant used to operate two boilers for 10 TPH load. Now this single boiler generates that much steam. So Plant can save the Power consumption of One Feed Pump (15 KW), One Oil Preheater (7.5 KW), One Blower (22KW) and One oil pump (5 KW).

Variable Frequency Drive in Vibro Exhaust Fan

Earlier in plant, motor were operating at its full speed and controlling air flow by damper. there was some wastage of air or can't use full air which is produced by blower. Now plant is using Variable Frequency Drive to control the speed of motor. And in results found constant air flow without controlling damper i.e. full use of motor output.

Variable Frequency Drive in Static Flow Blower

Earlier in plant , motor were operating at its full speed and controlling air flow by damper. there was some wastage of air or can't use full air which is produced by blower. plant is using Variable Frequency Drive to control the speed of motor. And in result Plant found constant air flow without controlling damper i.e. full use of motor output.

Projects Implementing During The Year 2008-09

- Installed High speed Automatic Seamer in Flavour Milk section for milk tin seaming.
- Replaced Alfa Laval Milk Pasteurizer for 20 KLPH to 30 KLPH.
- Converted 'Set pack' make Pneumatic type pouch machine in Mechanical Type.
- Installed Ghee cattle with high capacity, steam control system & Agitator.
- Installed Plate Heat Exchanger for butter milk.
- New Effluent Treatment Plant commissioned.

Environment and Safety

Amul had set up the Effluent Treatment Plant (ETP) way back in 1974 i.e. before the existence of State Pollution Control Board. Since then it has been taking utmost care in protecting the environment. Dairy has year after year reduced water consumption, improved solids recovery and now the plant management had installed new ETP plant with 15 Lakhs Ltr. /day capacity 3 kms. away from Dairy plant.

It is at the verge of renovating its plant for ensuring 100% recycling of its treated effluent and generates revenue through production of fodder for cattle.

Safety first is the slogan of the organization. Safety committee ensure safe working environment through involvement of all employees in their respective work areas.

The safety concept is enhanced through – 1) Safety training, 2) Safety meetings, 3) Safety Day Celebrations and 4) Safety slogan & Safety essay competition.