

ENERGY PROJECTS DURING 2007-08

1. Replacement of old Homogenizer

The old Homogeniser was replaced with a new efficient 10 KLPH capacity Homogeniser. The quantity of Homogenization & out put increased with less consumption of power resulting in savings up to the tune of Rs 4.61 Lakhs/annum.

A.

The current drawn by the old homogeniser
= 75 Amps

The current drawn by the new homogeniser
= 50 Amps

Power consumed by old Homogeniser
= 50 KW

Power consumed by old Homogeniser
= 33 KWH



New Homonizer

= **17 units/hr**

= 8 hours/day

= **Rs 2.33 Lakhs/ anum**

Power savings

Hour of operation

Savings/ anum

B.

Output of old Homogeniser

= 7500 Ltrs

New Homogeniser

= 10,000 Ltrs

Increase in output

= 2500 Ltrs

Over the old Homogenizer savings due to
Less hour of operation

= **2.28 lakhs/ anum**

C. Total savings (a+b)

= **4.61 Lakhs/ anum**

2. Replacement of Pneumatic type pouch filling machine with mechanical type.

The old pneumatic type pouch-filling machine was replaced with new energy efficient mechanical type pouch filling machine. We have noticed less load on Air compressor, and more output with less energy.

Calculation: - Old pneumatic pouch filling machine

Old machine output - 30-packet/ min X 2-60

New machine output - 38 pack/ min X2 -76



New mechanical packing m/c

Decrease of load on the compressor is 9 KW/hr for 12 hrs operation if increase in output of mechanical pouch filling machine is 11,520 packets (sachets)

Savings in power

= 9 units/hr

= 108 units/day

Savings in Rs

- 108X4.69

= 506.52/day

For one year

= 1.85 Lakhs

The no of additional hour required by old pneumatic machine to produce 11,520 sachets requires 11520/3600 = 3.2 hours.

Additional power consumed

= 3.2X9 = 28.8 units/day

Total savings

= 49,301 Rs/year + 1085

= **2.34 lakhs/ anum**

3. Pressure reducing valve (station) (P.R.V.)

P.R.V. at pressure reducing station was not functioning properly, resulting in high-pressure steam being supplied to the plant. To avoid this we were producing steam at lower pressure. We have replaced the faulty valve with new valve and now we are producing steam at 9 to 10 kg. We have achieved good reduction in furnace oil consumption.

F.O. Consumption/day

Before replacement of P.R.V.

= 1,500 ltrs

After replacement of P.R.V.

= 1,450 ltrs

No of running hours of boiler

= 12 ho

Savings of F.O./ day

= 50 Ltrs

Savings in rupees

= **4.99 Lakhs/ anum**



Pressure reducing valve to PRS

4. Re circulation of water for pouch filling machine

Water used to cool the horizontal and vertical jaws that hold the heating elements of pouch filling machine was around 7000 ltrs/day. To save soft water we have installed 500 ltrs capacity tank with a 0.5 HP pump. With this arrangement -6500 ltrs of water, which was being drained earlier, is now collected and the same is recirculated to the machinery.

Cost of water per ltrs

= 0.049

For 6,500 ltrs

= 0.049X6500

= 318.5Rs/day

Cost of water Rs

= **116252.5/year**



Water circulation system

5. Replacement of Chilled water line for C.R.T(Cream Ripening tank)

Chilled water collection pipe from cream ripening tanks to chilled water balance tank was of 2" size. Due to this around 3000 ltrs of chilled water per day with 3°C was wasted. The same was replaced with 4" dia pipe and the wastage of chilled water is stopped. Due to this we have achieved savings of Rs 11,523/annum.

Calculation

- 3000 X 1X (30°-3°)
- 81,000 kcal
- $\frac{81,000}{3024} = 27$ TR
- 3024
- 1 TR = 1.4 Units
- 27X1.4 = 37.8 units/day
- 2457 units/year
- 11,523 Rs/year Savings.



New 4" GI pipe

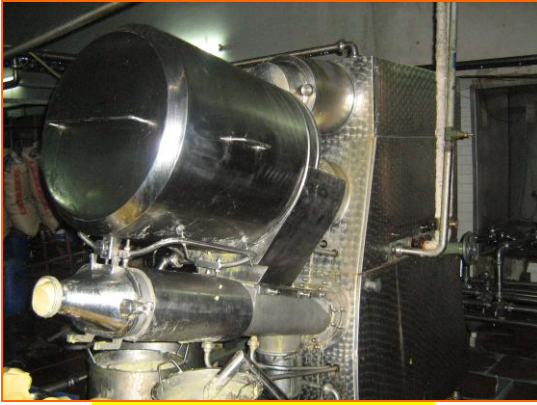
6. Installation of Continuous butter making machine (CBMM)

Commissioned a new continuous butter-making machine in place of old batch type butter churn. The operation hours of butter production has drastically come down to an extent of 50% resulting in savings of Electrical energy

Comparison

CBMM	BUTTER CHURN
Capacity: 850kg/hr	600 kg/ batch of 2hour
Load 17.5 KW/hr	15KW X 2 = 30KW/hr
Power required/kg 0.02 KWH/kg butter	0.05 KWH/kg of butter
Production/day 3500kg/day	3500 kg/day
3500 kg X 0.02 KW X 365 days X 4.69 RS	3500kg X 0.05 KW X 356 days X 4.69 Rs
119829.5 Rs/annum	2,99,573.75 Rs/Annum

Total amount saved is Rs1,79,744.25 /Annum



New 800 kg/ hour CBMM



Old butter churn

7. Replacement of old inefficient higher capacity motors by new lower capacity energy efficient motors.

Some of the pumps connected with old motors were frequently failing due winding failure, which were consuming more power and resulting in decreased output. We have replaced them with new energy efficient motors and we have saved Rs 1,24,363/annum

i) Tanker loading pump

Power consumed by the old pump
= 9.7 units/hr

Power consumed by new pump
= 6.5 unit/hr

Power saving = 3.20 units/hr

Savings in Rs = **54,779.20**

ii) Reception pump tank milk pump:

Power consumed by the old pump
= 5.16 units/hr

Power consumed by the new pump
= 1.93 units/hr

Power savings = 3.23 units/hr

Savings in Rs = **44,234.00**

10. Process cream pump:

Power consumed by the old pump

= 5 units/hr

Power consumed by the new pump

= 3.23 units/hr

Power saving

= 1.93 units/hr

No of hour run

= 3522

Savings in Rs

= **16,519.00**

11. Pre pack balance Milk pump:

Current drawn by old cream pump

= 3.5 HP is 5 A

Power consumed by the old pump

= 3.23 units/hr

Power consumed by the new pump

= 1.94 units/hr

Power saving

= 1.29 units/hr

No of hour run

= 1883

Savings in Rs

= **8831.27**



New pump with efficient motor

8. Proper and efficient operation of plant,

By providing proper training we are able to run the plant efficiently. More efficiency was achieved by completing some operations in only two shifts and arresting any small leakages of steam immediately as and when noticed. Further by switching off all electrical appliances when not required, using Solar lighting and natural ventilation etc. Totally We have saved around Rs. 16.71 lakhs/anum

Future Plans and Targets

In this regard few energy conservation projects were planned, discussed in detail to be taken up in the year 2008-09.

1. 225 TR De-Super Heater

We are replacing the existing 75 TR De-Super Heater with 225 TR De Super Heater, to conserve more thermal energy and to run the refrigeration plant efficiently. We have estimated savings to an extent of Rs. 25 Lakhs/Year, with an investment of Rs 24 Lakhs. We have already installed it and it will be commissioned by end of October'08.



2. Installation of energy saver for lighting system.

The lighting load of Kolar dairy is 70 KWH. The energy savings by installing energy savers is Rs 2.00 Lakhs with an investment of Rs 2.75 Lakhs.

3. Improvement Of Power factor from 0.93 to 0.99

By providing additional power capacitors we are able to increase power factor from 0.93 to 0.99, there by decreasing the electrical load on the system. The total cost of providing additional capacitors is Rs 60,000 only and expected savings is Rs 1.2 Lakhs per annum.

4. Replacement of Slip ring induction motors

At present 100 HP capacity of type slip ring induction motors are connected to 4 No's KC-3 ammonia compressors. We have planned to replace higher capacity slip ring induction motor with lesser capacity (75 HP) high torque squirrel cage induction motor, which consumes less electrical energy. The cost of 75 HP induction motor is Rs 6.0 Lakhs and expected savings is Rs.5Lakhs/annum.

5. Replacement of 7.5 HP reciprocating type boiler feed water pump.

The boiler is fed through 7.5 HP capacity reciprocating type boiler feed water pump. we have planned to replace it with 5 HP capacity vertical type boiler feed water pump at a cost of Rs 85,000 , the estimated savings is Rs 62,000 per annum. The proposal is under process.

Continued Environment Protection and safety measures

KOMUL has adopted many environmental friendly measures and new innovative steps to protect environment.



1. Planting Of Trees

KOMUL has planted around **200 Teak trees** and bulk of its area is covered by different varieties of trees, flowering plants etc, which infuses fresh air and creates best working atmosphere. Now we are planning to plant more trees in the dairy and at our chilling center premises.

2.Effluent water treatment plant

KOMUL has a full fledge effluent treatment plant to treat all the dairy effluents, and the treated effluent is used to grow fodder in an area of **4 acres**.

3. Rain water harvesting

Water is a scarce commodity in Kolar district, KOMUL has made efforts to conserve water. In this regard rainwater harvesting (RWH) project has been under taken on a large scale with an investment of Rs 14.0 Lakhs. Borewells are charged through RWH measures.

World Environment Day was celebrated on 5-June-2006 to create awareness among the staff and trees were planted.

Operational safety, Health and Risk (OSHR Policy)

KOMUL provides safety awareness training to all level of workers. Safety of people and assets is given **atmost** importance. KOMUL has formulated set of rules pertaining to human safety and clearly communicated to the employees. Workshops are held to create awareness among the staff. Safety equipments are provided to the working staffs. First aid facilities are provided in the plant. Periodical health checkup camps are conducted.

Simple schematic diagram showing the Production Process of the Dairy unit

