

Energy Conservation at BANAS DAIRY

BANAS DAIRY - *Introduction*

- Manufactures “AMUL” brand milk and milk products
- Plant Capacity : 10 LLPD
- Products : Butter, ghee, Ice cream, SMP, Dairy Whitener, UHT milk, Pouch milk
- ASIA's largest dairy plant.
- Peak milk handled 21.05 LLPD per day (2007-08)
- Annual turnover more than Rs. 1200 Crore

BANAS DAIRY – *Introduction contd.*

- State-of-the-art production facilities
- ISO 9000:2001, HACCP certified.
- 900 Village level societies (DCS)
- 450 Bulk milk coolers at DCS



BANAS DAIRY – *Introduction contd.*

- Expanding its Milk Receiving, Processing and production capacities up to 25 LLPD
- Establishing new State-of-the-art production facilities for Ice cream, Butter production – **BANAS-III Dairy plant.**



Energy Consumption & Cost for 2007-08

- Energy cost : Rs.37,05,80,895 (Rs.10,15,290 per day)
- Electrical Power cost
 - Rs. : 11,99,53,863
 - Kwh : 2,31,07,313
- Fuel (Furnace oil) cost
 - Rs. : 23,42,69,636
 - FO in Kgs : 10165995
- Energy cost is 3.05 % of total manufacturing cost
- Energy Intensive Products : Milk powders

ENERGY CONSERVATION APPROACH

- Continuous – ongoing approach
- Committed Top Management
- Methodology:
 - Awareness
 - Trainings
 - Internal Audits
 - Audits through external agencies : NPC, PCRA, Forbes Marshall, Thermax
 - Kaizen
 - SGA
 - Process Improvements



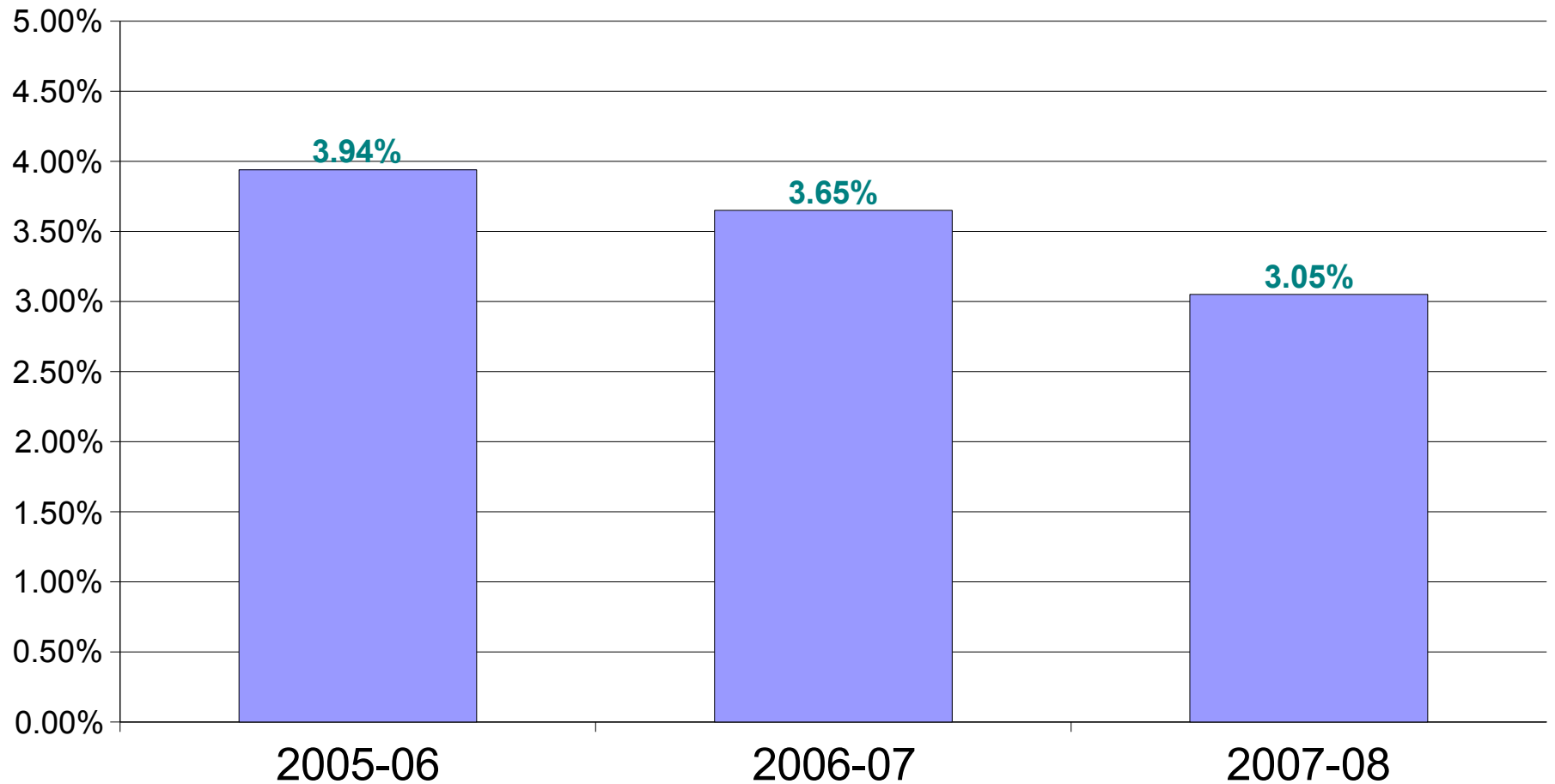
Results Achieved



Year	Actual Production (In tonne)	Specific energy consumption	
		kWh/ tonne**	Million Kcal/tonne**
2005-06	432120.05	49.45	0.2344
2006-07	441902.71	51.37	0.2175
2007-08	488106.88	47.24	0.2124

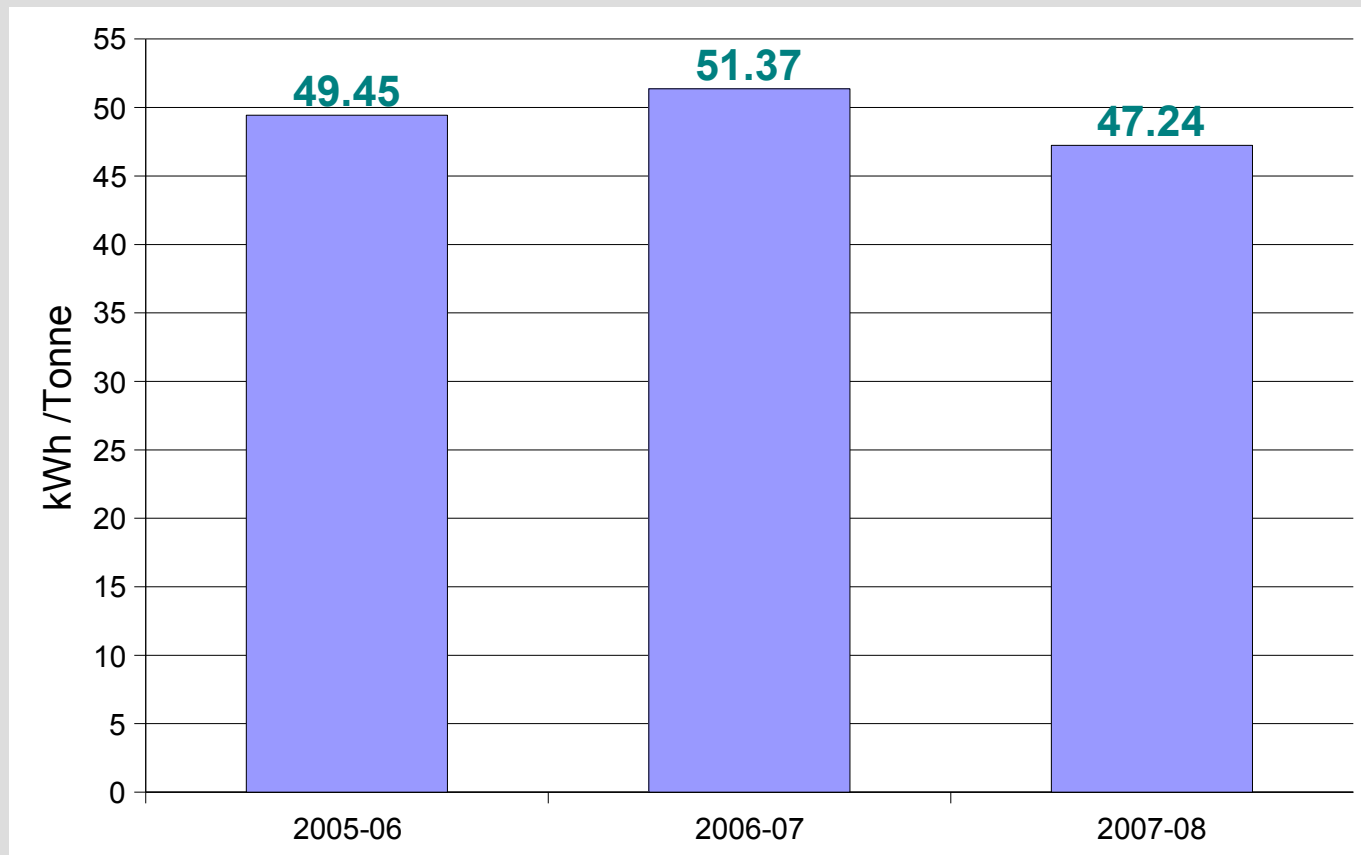
Results Achieved

Total Energy Cost (as % of Manufacturing Cost)



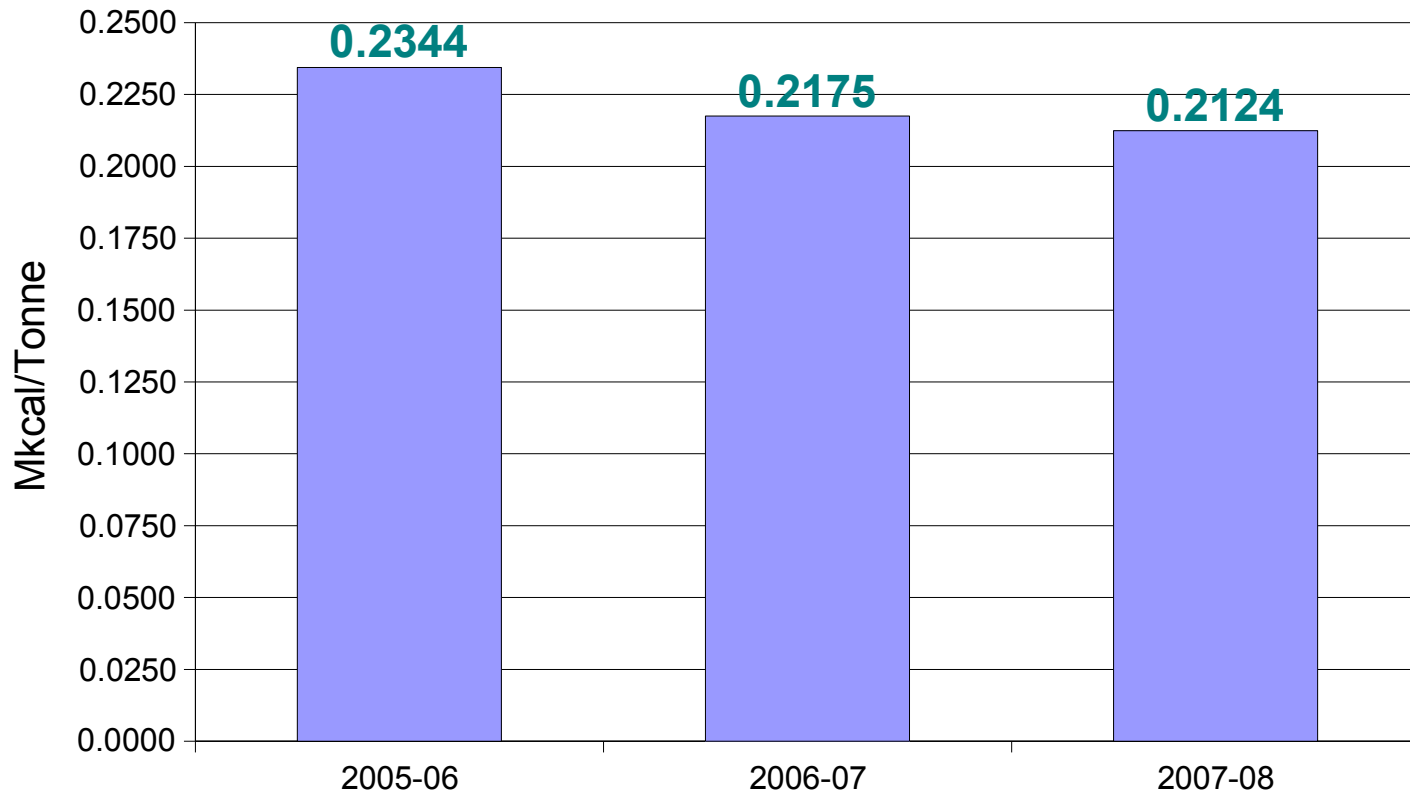
Results Achieved

- Reduction in Specific Power Consumption



Results Achieved

- Reduction in specific Fuel consumption



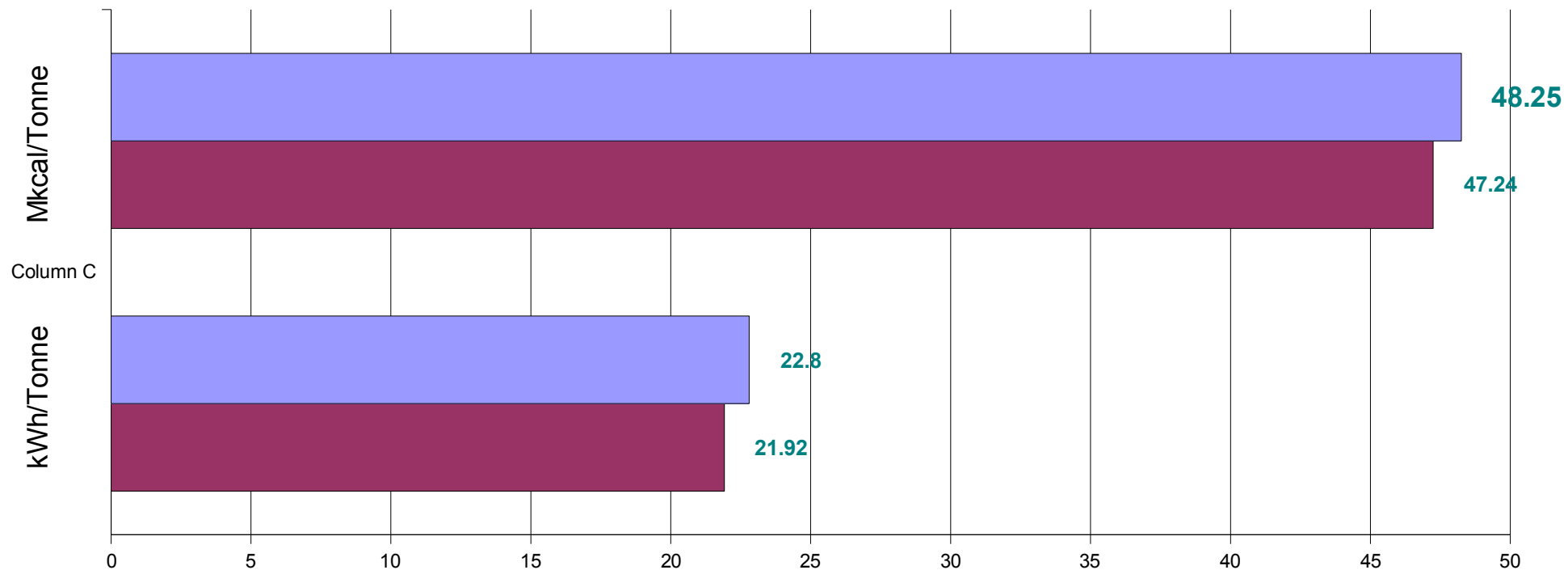
Specific Energy Consumption Targets

Specific energy consumption or use actual units						
Planned target for 2007-08 (a)		Actual achieved in 2007-08 (b)		% Reduction (+) or Increase (-) $\frac{(a-b)}{a} \times 100$		Money saved during 2007-08
*kWh/ tonne	FO L/ tonne	*kWh/ tonne	FO L/ tonne	*Electrical	*Thermal	Rs. Lakhs
48.45	22.80	47.24	21.92	2.5	3.84	146.95

Specific Energy Consumption Targets

Electricals	Planned Targets	48.25	Kwh /Tonne of Milk Processed
	Achieved Targets	47.24	
Thermal	Planned Targets	22.80	FO in L /Tonne of Milk Processed
	Achieved Targets	21.92	

Planned V/s Achieved Sp. Energy Cons. Targets



Implemented Energy Conservation Measures

Year of Project	Project Description	Total Saving (in Rs Lakhs)	Investment incurred on the Project (Rs. Lakhs)
2007-08			
1	Installation of Solid Fuel fired Boilers for existing heating load of process. This shall eliminate costly liquid fuel i.e Furnace Oil	1541.00	1000.00
2	Installation of Flash steam recovery system to recover Blowdown heat for Banas-II	3.50	2.00
3	Installation of VFD for 15 kW ceiling Cooling fan of 60 TPD powder plant	1.98	0.70
4	Installation of VFD for 75 kW motor of supply fan of 30 TPD powder plant	5.40	1.50
5	Installation of VFD for 45 kW motor of supply fan of 20 TPD powder plant	3.00	1.00
6	Implementation of 'ADVANCE PROCESS CONTROL-APC' in 60 TPD powder plant in order to - Increase powder production rate - Reduce Energy consumption This shall reduce specific power consumption for Electrical as well as	54.28	100.00
TOTAL		1609.16	1105.20

Implemented Energy Conservation Measures

Year of Project	Project Description	Achievement of Energy Saving per year basis			Total Saving (in Rs Lakhs)	Investment incurred on the Project (Rs. Lakhs)
		Power Lakhs-kWh	Fuels F. Oil (KL)	Fuels (In Mkcal)		
2006-07						
1	Up-gradation of 30 TPD powder plant for Capacity expansion and Energy efficiency	-	12.56	121.71	2.45	(Investment of 130.0 Lacs is not considered due to only few days of operation in 2006-07)
2	Replacement of Motors at Refrigeration section of Banas-2 plant which operates on under load due	0.28	-	-	1.46	0.00
3	Installation of Time switch for street light at Banas-I plant	0.01	-	-	0.06	0.05
4	Rebate for Power factor Improvement for year 2006-07 (For Dairy plant)	1.19	-	-	6.20	0.80
5	Rebate for Power factor Improvement for year 2006-07 (For Chilling Centers)	0.04	-	-	0.19	0.30
TOTAL		1.52	12.56	121.71	10.36	1.15

Implemented Energy Conservation Measures

Year of Project	Project Description	Achievement of Energy Saving per year basis			Total Saving (in Rs Lakhs)	Investment incurred on the Project (Rs. Lakhs)
		Power Lakhs-kWh	F. Oil (KL)	Fuels (In Mkcal)		
2007-08						
1	Up gradation and Modification of 20 TPD plant for better Energy Efficiency	1.24	38.00	368.22	15.11	90.00
2	Up gradation and Modification of 30 TPD plant for better Energy Efficiency	0.25	401.22	3887.82	93.85	0.00
3	Installation of VFD in Supply fan motor (200kw) in 60 TPD powder plant	1.15	-		6.02	7.50
4	Installation of VFD in Air compressor Motor (37 Kw) in 60 TPD	0.25	-		1.29	2.20
5	Installing New energy efficient Milk Pasteurizer having 90% regeneration efficiency	0.43	21.40	207.37	7.18	10.00
6	Installation of 02 nos PLC based Mechanical Milk pouch packing machine instead of Pneumatic Machine	0.48	-		2.51	12.00

Implemented Energy Conservation Measures

7	Retrofitting present T-12 fittings by T-5 fittings having electronic ballast	0.06	-	0.32	0.20	
8	Installation of Lightning transformer for Banas-I plant and	0.26	-	1.36	0.80	
9	Installation of close loop ring main system for compressed air piping	0.26	-	1.36	0.30	
10	Installation of 375 CFM new Energy Efficient air compressor with inbuilt air dryer	0.70	-	3.64	11.80	
11	Installation of Energy efficient compressor (KC3 In place of FRICK-7X7) at DANTA & RADHENPUR Chilling center (02 Nos)	1.54	-	8.08	7.00	
12	S topping of old Frick 7X7 compressor with modification of pipelines to run with new energy efficient refrigeration compressor	1.15	-	6.01	0.00	
13	Installation of Bio-Gas Plant at DAMA chilling center	-	-	0.22	1.35	
TOTAL		7.76	460.62	4463.41	146.95	143.15
GRAND TOTAL		23.31	513.78	4978.53	234.49	163.43

Planned Energy Conservation Measures

Year of Project	Project Description	Achievement of Energy Saving per year basis				Investment incurred on the Project (Rs. Lakhs)
		Power	Fuels		Total Saving (in Rs Lakhs)	
		Lakhs-kWh	F. Oil (KL)	(In Mkcal)		
2005-06						
1	Installation of Solid Fuel fired Boilers for existing heating load of process. This shall eliminate costly liquid fuel i.e Furnace Oil	-	-	-	1541.00	1000.00
2	Installation of Flash steam recovery system to recover Blowdown heat for Banas-II Boiler	-	9.35	90.00	3.50	2.00
3	Installation of VFD for Cooling fan of 60 TPD powder plant	0.33	-	-	1.98	0.70
4	Installation of VFD for 75 kW motor of supply fan of 30 TPD powder plant	0.90	-	-	5.40	1.50
5	Installation of VFD for 45 kW motor of supply fan of 20 TPD powder plant	0.50	-	-	3.00	1.00
6	Implementation of 'ADVANCE PROCESS CONTROL-APC' in 60 TPD powder plant in order to - Increase powder production rate - Reduce Energy consumption This shall reduce specific power consumption for Electrical as well as Thermal	2.13	144.00	1395.36	54.28	100.00
TOTAL		3.86	153.35	1485.36	1609.16	1105.20

Environment and Safety



- 'Zero Discharge' Effluent Treatment facility
- 100 % Utilization of Treated Effluent for Cleaning, Garden and Agriculture Irrigation
- Proposed new 1500 M³/Day capacity new Effluent Treatment plant with Recycling (Tertiary Plant)



Which can Measured gets Focused...

Which can Focused gets Improved...

Which can Improved gets Recognized...

Which can Recognized gets Institutionalized...

THANK YOU.....