

KCP SUGAR AND INDUSTRIES CORPORATION LIMITED
Vuyyuru, Krishna (Andhra Pradesh)

Unit Profile

KCP Sugar and Industries is a public limited company, which is having a capacity of 7500 TCD. The raw material is sugarcane and the final product is sugar. The by- product, bagasse obtained after crushing the sugarcane is used as fuel for the boilers. Unit has captive power generation of 10.5 MW capacity. The exhaust obtained from the power turbines is used for boiling the sugar juice to produce sugar.

Energy Management Policy

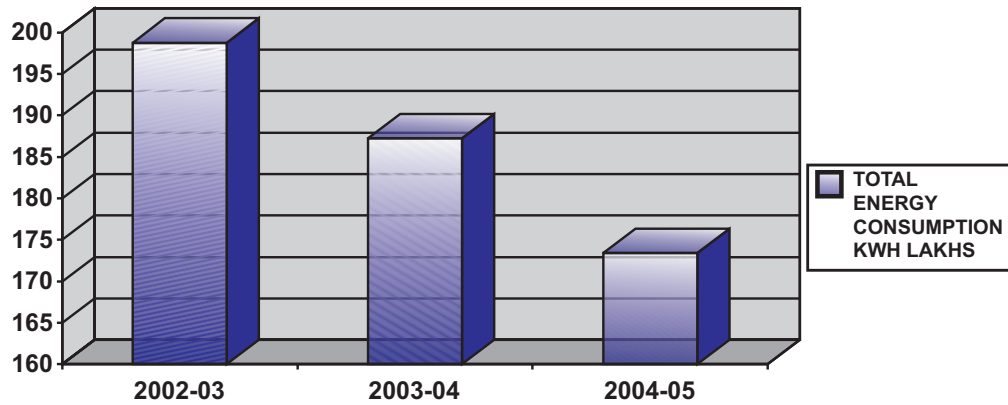
The Plant Energy Management policy strives for

1. Reducing the power consumption in the plant.
2. Reducing the wastage of heat energy.
3. To operate the plant with full efficient.
4. To operate the plant with reduced atmospheric pollution.
5. To train the plant personnel to achieve the above.

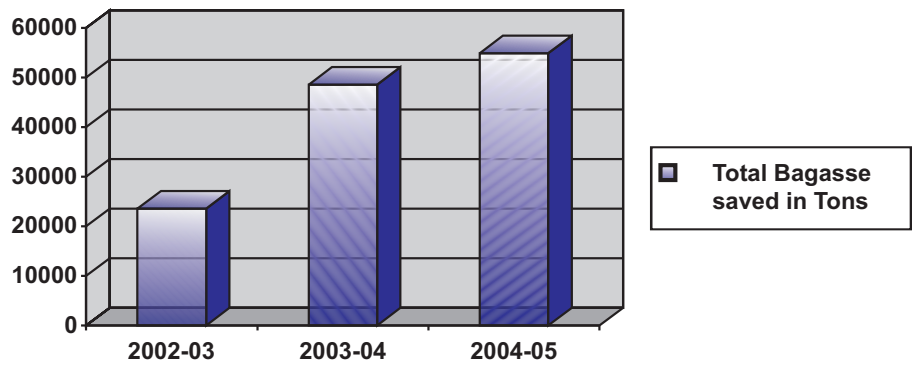
Energy Consumption

	Unit	2002-03	2003-04	2004-05
Annual production	MT	98199.4	106081.2	114444.2
Total Energy Consumption	KWh (Lakhs)	198.76	187.26	173.41
Total bagasse produced	Tons	298816	313317	291599
Total bagasse saved	Tons	23513	48529	54876
Steam Consumption	Mkcal/T	0.0063	0.0056	0.0046

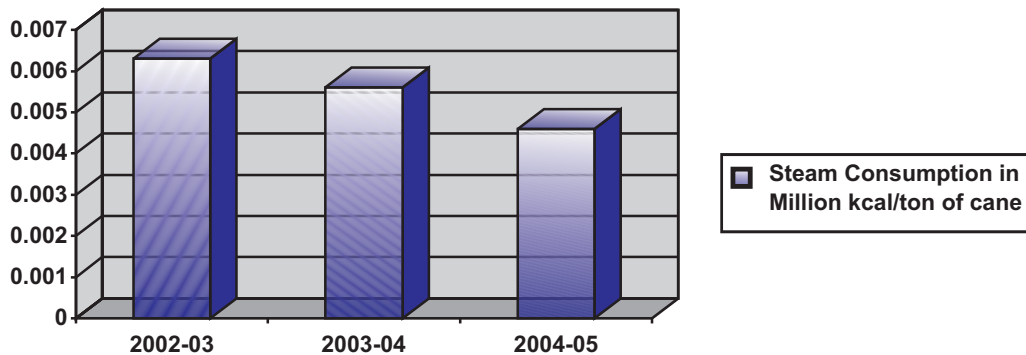
1) Energy consumption for the last three years.



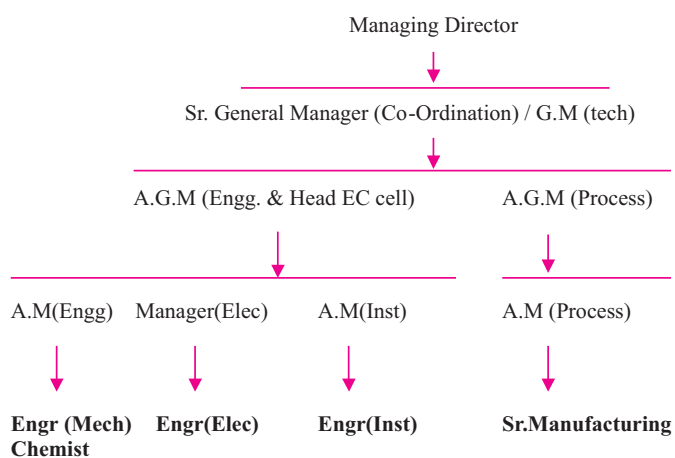
2) Fuel saved for the last three years.



3) Steam consumption for the last three years.



Energy Conservation cell



Functions of EC cell:

- 1) Implementing steps to reduce the power consumption and saving energy.
- 2) Analyzing the energy consumption every year.
- 3) Planning for usage of waste heat.
- 4) Plans to increase saving of fuel.

Energy Conservation Achievements

KCP has implemented many energy conservation steps, which can be said as the achievements obtained by EC Cell.

Some of the Energy conservation projects implemented during the year 2004-05 are :

- 1) Installation of heat exchanger to heat boiler feed water with the waste vapour condensate.



HEAT EXCHANGER

Unit has installed one heat exchanger to heat boiler feed water from the waste vapour condensate which went to drain till 2003-04.

The DM plant water, which is at 32°C, is sent to the heat exchanger and the outlet is sent to the boiler. The feed water temperature is increased to 60°C from 32°C. The source of heat is taken from the vapour condensate, which is sent as waste to the drain.

By using the system the economics are as follows

DM plant water quantity	-	20T/hr.
DM plant water temp	-	32°C
DM plant water outlet temp after heat exchanger	-	65°C
Quantity of heat absorbed by the feed water	-	$20(65-32)=660\text{kcal}$
Saving of the exhaust	-	$660/670=0.985\text{T/hr.}$
Saving of fuel by using heat exchanger	-	0.5 T/hr.
Saving of fuel for complete season	-	1500 Tons
Amount saved	-	Rs.14.25 Lakhs

2) Installation of VFD system to boiler ID, FD fans



VFD PANELS FOR ID AND FD FANS OF 100TPH BOILERS

For FD Fans

2003-04 Season

By running the fan at 980 rpm and by damper operation as per plant requirement the power consumed by the FD fans is 52 kW (Average Consumption)

2004-05 Season

After installing VFD, plant operated the fan at 700r.p.m.

Power consumption for the above speed	=	19 kW
Average power saved for the FD Fans by installing VFD is (52-19)	=	33 kW
Energy saved by installing VFD to FD fans	=	448800 kWh

For ID Fans

2003-04 Season

By running the fan speed at 735 rpm and by damper operation the power consumed by the ID fans is 158 kW (Average Consumption)

2004-05 Season

After installing VFD the average speed of the fan was 590r.p.m.

Power consumed for 2004-05 season for ID fans is 81kW

Average power saved for the ID Fans by installing VFD is (158-81) = 77 kW

Energy saved by installing VFD to 4 nos.ID fans is = 1047200 KWH

Total Energy saved = 448800 + 1047200= 1496000 KWH

=Rs.40, 69,000/-per year

**3) ENERGY CONSERVATION BY INSTALLING PLANETARY GEAR SYSTEM TO CRYSTALLIZERS.
PLANETARY GEAR DRIVE SYSTEM FOR CRYSTALLIZERS**



PLANETARY GEAR DRIVE SYSTEM FOR CRYSTALLIZERS

Plant is having 32 no's crystallizers which were operated by open type worm & worm shaft arrangement till 2003-04 season. For the season 2004-05 plant has installed MAGTORQ (Planetary Gear Drives) crystallizer drives.

The drives have planetary gear system which has high efficiency than the worm and worm shaft arrangement. Due to the high efficiency of the planetary gear system the power consumption has reduced drastically.

Total power saved for one season = 357000 KWH

5) ENERGY SAVED BY REPLACING CONVENTIONAL CONDENSERS WITH SED CONDENSERS



SPRAY EJECTOR CONDENSER

Plant has installed SED condensers in place of convention condenser for creating vacuum in the pans. The SED condensers work on auto basis and the flow of injection water will be controlled automatically based on the vacuum set point.

Energy saved = 986000 KWH

Other areas where plant has implemented energy saving methods

1. Installation of VFD system wherever it is necessary.
2. Using gravitational energy wherever we can use it.
3. Perfect insulation to the heat carrying equipment.
4. Circulating the water of the oil coolers of the turbines to the cooling tower.

Details of Energy Conservation plans implemented

Energy Saving Measure	Amount Saved (Rs. Lakhs)	Investment (Rs.Lakhs)	Year of Implementation
Installment of VFD to ID, FD fans	40.69	15	2004-05
Installment of Planetary Gear drive system to crystallizers	9.71	50	2004-05
Installation of SED Condensers	26.81	75	2004-05
Heat Exchanger for heating boiler feed water with vapour condensate	14.25	2	2004-05

Safety and Environment

KCP has a very good record in implementing safety and environmental norms and got many awards in safety and environmental aspects.