APOLLO TYRES LTD.

Perambra P.O , Thrissur Dist , Kerala State

UNIT PROFILE

Apollo Tyres Ltd is a 2700 crore annual turnover company with its manufacturing plants at Permbra & Kalamassery in Kerala , Vadodara in Gujarat and Pune in Maharashtra. Apollo tyres is engaged in the production of bias and radial tyres for all types of Vehicles .Apollo tyres is a QS 9000 certified company and will be upgrading to TS1619 shortly.

Perambra plant is known as the mother plant of Apollo tyres Ltd., and was incorporated in 1975. Commercial production was commenced in 1977 with a cpacity of 80 tons per day which has now reached a capacity of 270 tons per day.. The product range of this plant includes bias tyres for trucks, light commercial vehicles, passenger cars, front & rear tyres for tractors and radial tyres for various farm sizes. Perambra plant houses a manpower strength of around 2500 out of which 250 are in management cadre.

ENERGY MANAGEMENT POLICY

"Apollo tyres limited is committed to the preservation of precious energy by minimising the usage of power and fuel. All members of Apollo family will always strive to achieve the best figures in industry with respect to specific power and specific fuel consumption. We at Apollo tyres believe in continuos improvement and innovative methods to achieve this. Also there will be continual monitoring at the management level of the energy consumption performance factors."

Apollo tyres always strive to achieve the best national and international standards in efficiency .It is the corporate policy of Apollo tyre to achieve 5% reduction in power and fuel consumption every year . Energy conservation initiatives are carried out in two stream of actions viz;

- As a budgeted exercise whereby energy conservation projects are identified to enable achievement of 5% improvement on energy efficiency norms over the average achieved figures of preceeding year. Such projects are presented at the top management level and savings potential, paybacks and time frame for implementation are crystallised.These projects are identified through energy audits, brain storming sessions, interaction with industry experts and collabrators etc.

- As a part of an organisational culture that promotes continous improvements. Energy saving is also achieved through various suggestion schemes, activities of quality circles, Kaizens etc; where the contribution is largely from the shopfloor supervisors and workmen.

All identified projects are implemented with the active involvement of the personnel in the concerned area with the responsibility being taken by the concerned sectional engineer. Of late, remuneration of personnel are also linked to achievements through this kind of energy saving projects and ample oppurtunity is available to have earnings based on savings achieved. Awards are also given for the selected projects through suggestion schemes.
As a matter of policy it is ensured that at least one CFT is formed in each section for improvement activities in which energy conservation is a major item.

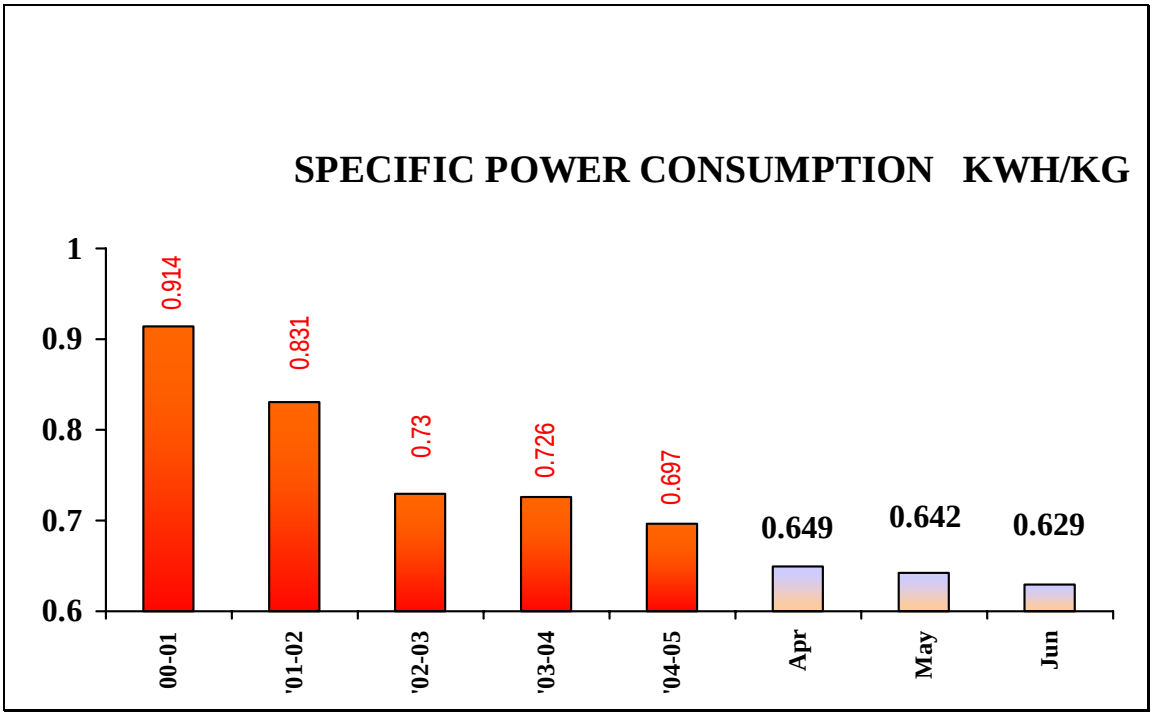
DAILY REPORTS

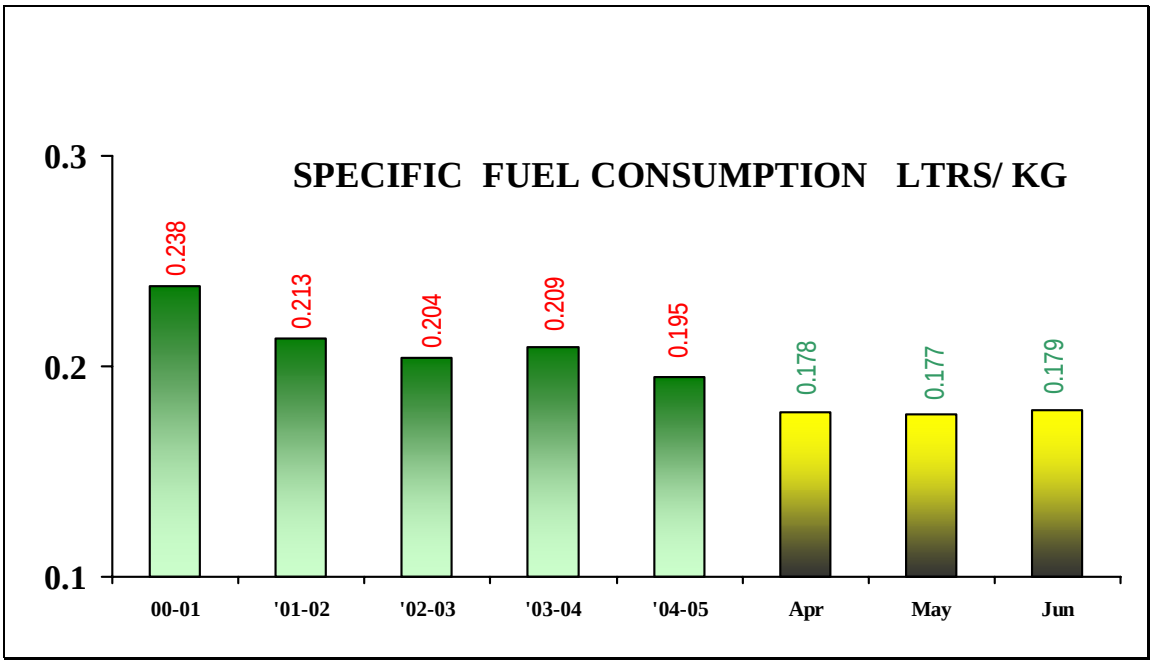
- The power consumed from Grid with other parameters like maximum demand, power factor, specific energy consumption etc
- Machine/feeder wise electrical energy consumption is circulated section wise for monitoring and analysis by users .
- Daily report on steam consumption ,Fuel consumption ,specific fuel consumption ,condensate recovery are prepared and circulated for analysis

MONTHLY REPORTS

- Status of energy conservation projects prepared by area in-charges.
- All efficiency parameters, status of energy conservation projects, best practises followed etc. are shared between diferent plants through corporate engineering department.
- KRA review meetings in which internal bench markings and corresponding performances are discussed.

ENERGY CONSUMPTION CHARTS





MAJOR ENERGY CONSERVATION PROJECTS 04-05

- **Replacement of reciprocating compressor with screw compressor in chiller** .

Chilled water at a temerature of 14 degree Celsius was used in the process of tyre production

Old system
4 nos of 120 tonne reciprocating compressor chillers .This chillers were installed in 1990 and has an efficiency of 0.8 kw /tonne of refrigeration.
Conuming 9100 kwh /day .

New system
2 nos of screw chillers were used with an efficiency of 0.45 kwh/tonne of refrigeration .
Now the power consumption for chiller =5800 kwh,
Savings in power 3300 kwh/day
Investment 50 lakhs

- **200kw variable frequency drive for air compressor**

A bank of 5 compressors were running in parrellel to meet the plant air requirement .The line pressure is maintained by unloading of one compressor .This method was generating 2 types of energy wastes

1. The line pressure is fluctuating in arrange of 0.5 kg/sqcm
2. The unloaded compressor motor is consuming its n load power

working pressure of compressor 6.5 to 7.0 kg.sqcm
total energy consumed by air compressors =19400 kWH
Estimated savings by maintaining pressure at 6,5 kg/sqcm =900kwh/day
Estimated savings due to no load running of 200 kw compressor motor=720 kwh/day

- **Replacement of conventional Ballasts of lighting** .

Existing system

Plant lighting was provided by 6000 twin tube light fittings .
The following problems were observed

1. Plant lighting was not sufficient
2. Energy consumption was high
3. Tube failure and replacement cost was high

The following modifications were done on lighting to solve the above problems .

1. All fittings were fitted with alglass reflectors for better efficiency
2. Conventional electromagnetic ballasts were replaced with Electronic ballsts
3. Conventional T13 tube lights were replaced with high efficiency T8 and T5 tube lights

The project has been completed in a span of 3 years
This has produced the following benefits

1. Plant lighting improved by 30%
2. Number of working fittings increased to 98% from 75% .
   (the life of T13 tubes are 5000 hrs ,T8 & T5 tubes with Electronic ballasts are 18000 hrs)
3. Energy consumption reduced .

All this achieved with the same amount of maintenance cost .

- **VFD for Dip unit vaccum extractors .**

2 no 15 kw blowers were used to produce vaccum for extracting latex from the fabric during its processing.
The amount of vaccum generated was controlled by throttling the air flow to the blower .
Variable frequency drives were used to reduce the speed of the blowers to control vaccum.
This has produced a savings of 0.72 lakh kwh /year .

- **HOT WATER RECOVERY SYSTEM .**

Hot water recovery system.
The final stage in the tyre manufacturing process is vulcanization of rubber compound known as tyre curing, using steam and hot water at a pressure of 350 psi and 165 deg. C.The hot water required for this is prepared in a deaerator using warm water from a hot sump and fresh steam.

PREVIOUS SYSTEM
After the curing process, this hot water is drained to an open hot water sump. This hot water at a temperature of 165 deg. C flashes at atmospheric pressure and the temperature drops to less than 100 deg. C, causing huge energy loss. In the next cycle this water is again heated to 165 deg. C in a deaerator using fresh steam.

MODIFIED SYSTEM
In the new energy efficient system the hot water which is rich in heat content is directly sent to the de-aerator. This is accomplished by purging the hot water out using cold water at 350 psi. This requires a lot of fine tuning and sophistication to avoid cold water being forced to deaerator especially when different presses operate in different cure cycles. This is accomplished by PLC controls with in-house developed software. This method eliminates the necessity of reheating the hot water thereby saving the steam and electrical energy for pumping the hot water back into deaerator.

Tyre industry through-out the world follows the previous system for tyre curing and it is for the first time Apollo experimented the new system. The annual savings realized by implementing this system is to the tune of Rs. 8.4 million..