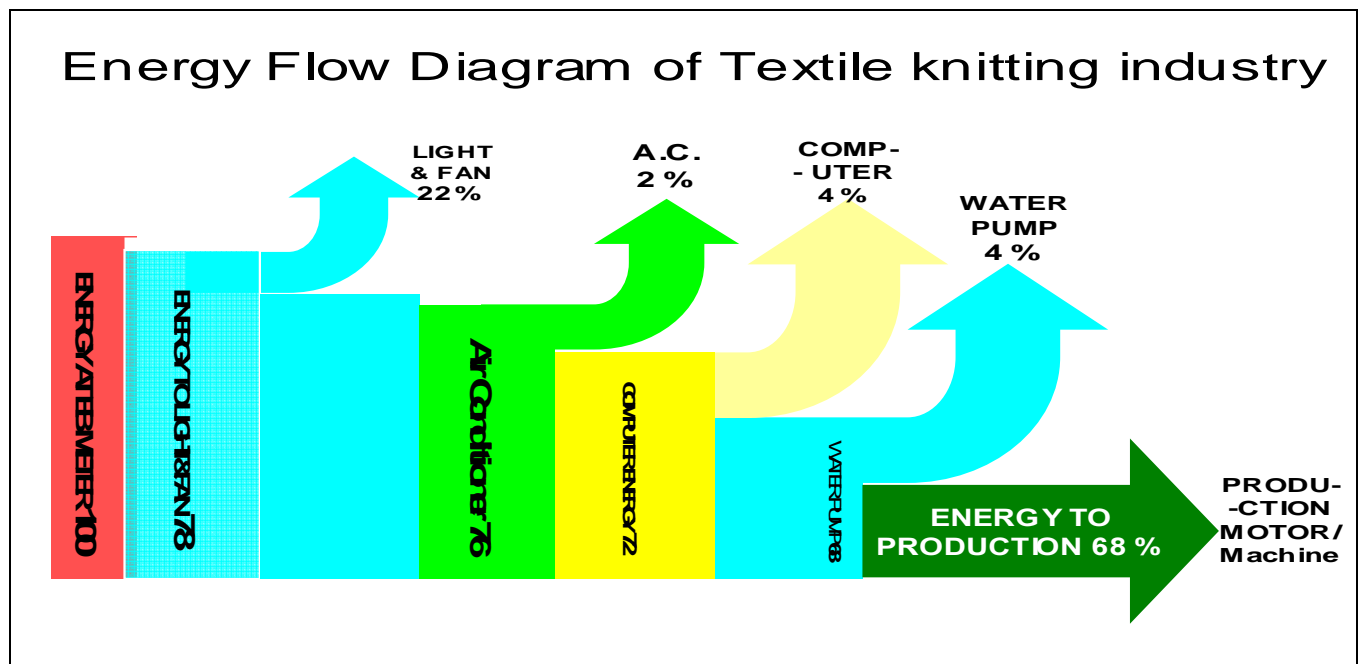


ENERGY CONSERVATION IN TEXTILE KNITTING INDUSTRY

- 'Energy Measure & Manage' methodology is a Condition based Monitoring tool especially to the knitting industry. The energy intensity inside the industry is not much, but that does not imply that the energy need not be routinely monitored. By regular monitoring and analyzing the energy consumption of the process and utility, the industry stands to gain by the Safe working practices. When hundreds of motors are monitored for safe working, the industry manager is able to predict the breakdown of the motor before hand and hence applies preventive & corrective action. This action ensures the machines are health monitored and kept readily available to process to suit to market demands.
- This MLM (Micro Level Monitoring) & MLA (Macro Level Analyzing) of Energy enables the industry manager to assess the energy cost per say 1000 cloth pieces in his unit i.e. the Specific Power Consumption for the given end product. The product can be different type of fabric but for the given batch of cloth piece what is the energy overheads arrived at and the same can be linked to the Operating Profit Margins per batch wise in the industry. This will also indicate the safe working of machines too.



- This Energy Flow Sankey Diagram is based on the installed power capacities and the break up of consumption of energy from EB to the process in one of the industry segment our Conquest team had done the Energy Assessment at Tirupur.
- LIGHTING UTILITY IN GENERAL
- The industry must take advantage of the fact that the Light Intensity from the Sun is 1.2 Lac Lumens per sq meter and the Diffused Light radiation near the window is 500 to 600 lumens per sq meter. In practice, we must grab this inexpensive and diffused light source to our premises from all around.

- The lighting saver or servo stabilizer fitted into the lighting circuit at the incoming in each of sub main boards, will give up to 20 % savings apart from the reduced failures, tube light life increases, inventory per month comes down, safety aspects wise it gives constant voltage at all the times and lumens is constant all the time. This can be tried in each section separately for given batch of tube lights in that section and see the savings before and after the stabilizer inserted in the lighting circuit.
- The lux at each of the table needs to be measured once in three months and we find excess lumens on the tables and this will tire the worker's eyes. This also happens in the first 100 hours of a new tube light. After that it reduces by 10 % and the lumens sustained till 2000 hours to 3000 hours. Once the voltage is regulated, then this problem will not arise.
- Where there are no reflector shades on top of tube lights, it has to be fixed and this enhances the lighting distribution. When we buy tube lights, take care to buy one 5 star rated as per BEE guidelines. This gives long life and better lasting lumens over its period of life. The 5 star tube light gives 92 lumens per watt where as a 3 star tube light gives 67 lumens per watt only
- The degree of reflectance of the reflector material and the reflector's shape directly influence the effectiveness and efficiency of the fitting. Conventional diffuse reflectors have a reflectance of 70-80% Newer high reflect anchor semi-diffuse materials have reflectance high as 85%. Conventional diffusers absorb much of the light and scatter it rather than reflecting it to the area required.
- Later we can think of technology changes like an LED in the tube light size consumes only 14 watt instead of 40 watt tube light. This is pleasing to eyes and life is 1 lac hours compared to few thousand hours of tube lights. This is an idea and future thinking one in the long run. Later the LED will be the best in visual tasking.
- INDOOR AIR QUALITY: -
- Many players in this industry segment use different methods of positive cross ventilation inside the premises, using ceiling fans, industrial humidifiers using CELDEK pads, and split air conditioners as types of ventilation.
- To improve the comfort levels of man and machine, each industry thinks differently. The cost effective option is the ceiling fan. The ceiling fan coupled with electronic regulator gives only positive breeze inside the premises. The self powered roof ventilators prevent heat ingress from the roof top and dissipate the heat thro the roof top. Where ever possible on asbestos roofing, try to introduce solar lighting inside thro roof poly carbonate sheets with good thermal insulation.
- One industry used the Industrial Humidifiers on the roof top using CELDEK evaporative cooling pads consume only 1 KW for 10,000 cfm of air, reduce indoor air temp by 5 *C and provides better comfort in tropical climate region.
- Other industry used Split Air conditioners to provide better Air conditioning, the Split Air conditioners consume much more power and become major portion of the daily energy consumption pattern in the industry and hence not cost competitive.
- The layout of machines, working area of workers etc need to have a better breathing space for both. The productivity levels go up provided the man handles the machine & work with better light, effective ventilation and safe working practices.

- The existing ceiling fans consume 70 to 80 watts and BEE rated 5 star fans consume only 50 watts. In replacement and new purchases, to plan to go in for the same. Energy Saving 50 watt Ceiling fan gives the service value of more than "4" which means Air delivery of more than 200 cu m/min and wattage consumption of less than 50 Watt. More the Service Value of a fan, the higher its efficiency.
- The industry to replace the existing regulator and to go in for Switch type Electronic regulators for fans and the present ones like knob type or rheostat type the failures are more and this gives around 35 % savings and gives breeze effect inside It is better to replace this as a specific activity because the existing regulators may be running at full speed and air balancing and positive cross ventilation cannot be achieved if the regulators malfunction.

- MOTORS' HEALTH at MACHINES

- The industry can check with the thermal gun, the skin drive end and non drive end temperatures of the motors of all the stitching machines. To buy Thermal gun and check for any hot spots etc on the electrical wirings, motor temperatures, steam line and boiler house temperature, fusing machine heater surfaces etc. This costs less than Rs.4000/- and it is worth the tool for predictive maintenance of equipments.
- The industry can know about the health of stitching machine motors, we have to insert power meter along with plug and socket to each of the 400 motors and measure what the motor takes 250 / 400 watts etc at the incoming of each of the motor. This helps to know the and why some motors are consuming more and how to correct the same in hundreds of such motors. To create record of what motors are rewound, and during service, what all the parts like brake, clutch shoe etc, bearings changed or not and this helps to know the health of motors.
- We take preventive action in each motor so that the motor do not fail or breakdown and before failure they start drawing more current and power. Hence we could save on condition monitoring of the same and don't allow motor to go for breakdown and make them all available to production always.

- INSULATION –THE FOCUS AREA

- If the industry achieves the best quality insulation to the heat pads used in fusing machines etc, this improves comfort level of working; energy savings in heating power, radiated heat to the surrounding areas can be avoided.
- On the fusing machines used in the industry, the top surface of heater is around 70 to 90 * C and normally it will be around 50 * C that is ambient + 20 *C and hence lot of heat is wasted in the wrong side of heater. The industry needs to promptly insulate the same with adequate good quality insulation pads.
- The insulation on the boiler and steam lines has to be condition monitored. The boiler lines steam to machines near the valves at the header, boiler flue gas line insulation are the frequent focus areas using the thermal gun and take corrective action as soon as possible. To call good insulation contractor and do patch works in all the above places and this cost of insulation and re insulation - the pay back is with in a month.

- BOILER AREA -
- The industry to add the Condensate Recovery retrofit in other boilers too and this gives around 30 % savings we presume. Now lot of condensate is drained in pits outside and lot of low pressure flash steam is wasted. This can be reused.
- The industry to plan for solar water heater to preheat the water to boiler and this helps to reduce that much of diesel consumption. We are aware a domestic solar water heater 100 liter capacity gives 1500 units of Electricity saving annually to the individual and is the real “ Small Drops make Big Ocean “ retrofit not only to individuals but to our Industry segment as well and National Priority too.
- To know the boiler loading & efficiency, the industry can fix water meter in each boiler feed water line so that how much steam is produced for the given consumption of liters of diesel. This will indicate boiler efficiency and comparing the boilers we will know how to reduce diesel after improving the efficiency.
- - **S.ASHOK, BEE certified Energy Auditor/Coimbatore/ Mail - Call - 94437 20220;**
 - **Pls. visit site www.energymeasuretosave.com for practical energy saving tips.**

Sharing knowledge to SAVE OUR ENERGY !

Conserving Energy is OUR Collective Responsibility, for a Better Tomorrow!