PAT SCHEME BATS WELL FOR INDUSTRY ENERGY CONSERVATION

- National Energy Saving Targets under the PAT scheme (2012-2015) is a meager 1 % from Textile segment, Courtesy: Source BEE PAT portal.

- It implies that many more DC from the textile spinning and Processing are not yet identified still. **When only 100 DC are identified,**
- **figures imply that 1000 more DC need to come.**

- As on date, the power to production cost in a modern spinning mill is around 15%.

PAT - an essential and indispensible tool on your way to ISO 50001certifications

- Initially, PAT will look difficult and cumbersome to start with,
- but once done with the tuning to the PAT formatted workings,
- you will be Delighted to project the PAT results to the Management and every aspects of your energy consumption
- by addition, modernization, towards environmental improvements, towards quality improvement as value addition etc
- every minute matter pertaining to mill energy consumption is put on records now.
- This PAT will serve as an essential and indispensible tool on your way to ISO 50001certifications
- **and adherence to EnMS to establish, implement, and maintain to improve the Energy Management System.**

PAT is not for enforcement only but as well to Energy-Educate the Industry

- The Authority must extend the PAT workings by showcasing the case studies to the other mills in the segment.
- This awareness PAT workshops can be entrusted to the respective segment's BEE certified Energy Managers and Auditors and the same to be performed in each and every region annually.
- PAT is not for enforcement only but as well to Energy-Educate the Industry.
- Vast pool of around 13700 Certified Energy Managers and Auditors as on date is ready to share the knowledge learnt in Energy Management thanks to BEE certifications.

PAT CYCLE & CEA / CEM Engagements

- **Around 40,000 Engineers have appeared already**
  - **and say 13700 are certified as on date,**

- and more to come now, the Ministry thro BEE must engage the certified Energy Professionals CEA & CEM for the PAT workings.

- Practically hundreds of CEM have been recruited by the thousands of DC as on date, a miniscule fraction?
- Please Enforce that each DC must have a CEM from this year.
- Thanks to BEE, who has guided the Engineer to become Energy Manager & Auditor all these years,
- it is comulsory now, for BEE to engage the Practising Energy Auditors & mandatorily to the industry.

IAEMP – EDUCATION ARM OF BEE

- Energy Education is Half Done in the Energy Conservation Program.
- First educate yourself to conserve on the macro aspects.
- Energy audit once in three years by any external CEA & CEM will definitely bring in Low Hanging Fruits,
- till now not noticed by you.
- No two vehicles running on the same road, same KM and at same conditions yield the same mileage.
- So routine energy monitoring on-line needs to be done on each & every motor, rated above 5 KW.

PAT is a tool with which you can project the Energy Savings to the Industry management

- Industry Managers Please, you still have Ample scope of Energy Conservation in your mills and
- PAT is a tool with which you can project the Energy Savings Achieved and commercialize the same by Trading.

- Textile segment is the only segment where, the threshold for PAT is only 3000 MTOE;
- the other designated sectors have much higher threshold MTOE to become a DC.
- BEE needs to engage more, our CEA in PAT to make it more effective & Achieve energy savings.

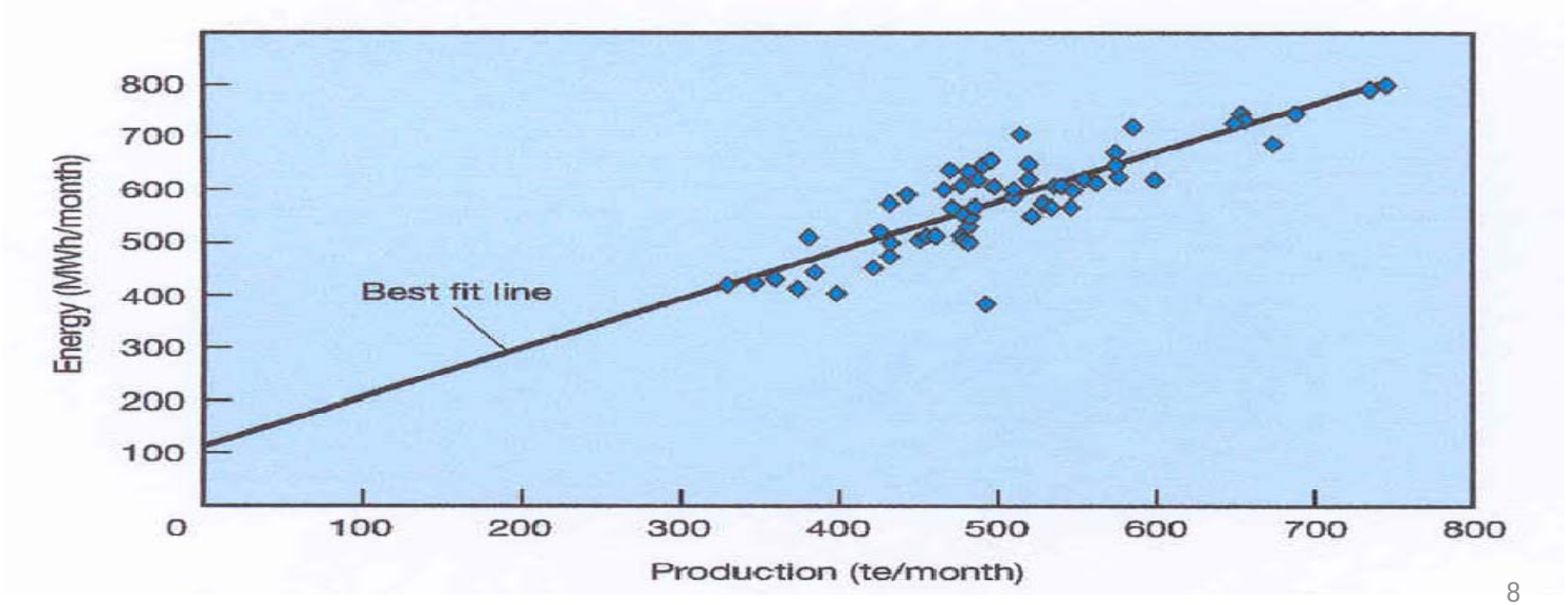
Also give a thought process, how the PAT can inculcate the ECON culture

- Please don't' view the PAT scheme as a compliance scheme
- each industry management is forced to adapt to PAT mechanism.
- Also give a thought process how the PAT can inculcate the ECON culture & practice in people,
- by showcasing the Energy Efficiency implementation to the common Industry public

What is the Relative monthly Power to Production costing % Above or Below LINE ?

Y = MX + C : Energy consumed for the period Y = M x Production for same period + C

M is the energy consumption directly related to production (variable) and C is the "fixed" energy consumption (i.e. energy consumed for general auxiliary services



Energy Monitor to Target - BEE MANTHRA.

- the mill consumes say lakhs units / day;
- but does not have full fledged energy meter
- for relative condition monitoring
- to do now, the energy metering & monitoring
- at mv, ssb & higher hp say > 10 hp machines, etc
- **machine to machine variations are more in our mill and**
- **this is around 10 % in some cases.**
- the electricity for machines from 10 hp and above in kwh
- is a good indicator about the health of machine.
- **BEE mandatory guidelines suggest any motor above 10 hp**
- **operating more than 6000 hours an year**
- i.e. 2 shifts per day to be metered for energy kwh.

Energy Intake by the industry
Energy Losses (Between the Cup & Lip in industry)

- Voltage Regulation - in Stages upto Load End
- Power Factor - Improvement in Stages
- Harmonics reduction - in stages upto EB end.

- Compressed Air – Cool Dry Air in Stages
- A C Plant - Moisture ingress in stages to yarn.
- Waste Collection- Optimized suction Pascal in stages.

- Energy Measured Digitally & Accurately in stages.
- In between machines, then at SSB, next MV panel
- Measure Energy Deviations from Entrance to Load End .

BEST PRACTICES & TECHNOLOGY UPGRADATION IN TEXTILE MILLS:-

- On-line Energy monitoring will become handy to mills when implementing and recording the ECON values.
- This is the First & Foremost tool to catalyze the Energy Monitoring and Targeting the Energy Reduction.
- Distribution losses in Electrical, Humidification plant, Waste Recovery Header Pascals, Compressed Air, and Water ingress to improve RH.
- Power Quality improvements to address to mills.

TEXTILE SPINNING MILL ARE NON-LINEAR ELECTRICAL LOADS NOW

- Provide SPD Surge Protection Devices in each MV panel, SSB and in DB and in the critical soft machines.
- Since majority of mill is VFD driven, plan to add Line Reactance choke at each VFD incoming to arrest same.
- Major non-linear loads have crept in now, it will be prudent to keep PF between 0.97 to 0.98 and
- any excess capacitors in the Leading PF region at transformer secondary is a loss and leads to unsafe leading voltages

BEWARE, where Electrical Safety Fails, the Conservation Fails and Pollution Starts.

- All the Energy Saving Certificates come into effect,
- only if the mill complies with the Electrical Health and Safety norms stipulated by the Authority.
- This may sound louder, please BEWARE, where Electrical Safety Fails, the Conservation Fails and Pollution Starts.
- And you have to face the Impending Breakdowns from all quarters.
- Optimizing the mill energy parameters with due adherence to Electrical Safety will automatically yield Energy Savings to us.

Healthy Mill can Achieve More and sustain in Production after Optimizing its Power.

- Healthy Mill can Achieve More and sustain in Production after Optimizing its Power.
- So Initiate the PAT Compliance in your industry now, either you become a DC now or later, and
- utilize the same in your PAT Implementation for your benefit first, and
- kindly Share your ECON Knowledge to Save OUR ENERGY, DC after PAT are showcasing their ENERGY CONSERVATION MEASURES thro the BEE site www:knowledgeplatform.in

Textile mill till date, have not utilized the energy efficiency process in Fans.

- Closed loop VFD control of centrifugal blowers and pumps yield huge energy savings.

- **Optimizing & automating the same process parameters will improve the productivity, and reduce power consumption, flattening the peaks.**

- Properly match the Raw Cogged Belts from motor to machine Today, we find now the new belts today,

- weigh less, have more power carrying capacity and do not allow KW loss to happen in your belts & pulley.

Motor to Machine (spindles) linkage in Ring frame by 52 Bearings & over-greased tin-roller acts as load.

- Excess lubrication by greasing in bearings in frames and oiling the bolsters have increased the energy losses over years,
- mill silently pumped more till date, to somehow run the machines always at above 99 % utilization!

- Start planning to replace all your IE 1 motors, but study during replacement, the before & after KW savings and before & after Motor shaft RPM increase.
- IE3 motors behave like IE2 only on the VFD mode.
- Optimize motor loading routinely.
- When motor loading is always less, retrofit Automatic Delta to Star gadget to save in motor in carding cylinder etc.

SEC of a Mill is affected by not only production machines, but also inefficient utility loadings

- Instead of macro-pondering about overall mill UKG,
- look into micro SEC of utility of compressors in Watts per CFM (varies from 150 Watts to 250 Watts),
- **Air Compressor produces now 7.5 cfm per KW @ 5 Bar now.**

- Waste Recovery system blowers KW per CMH (varies from 800 to 1400 CMH),
- AC plant Fans KW (Air power varies due to Static pressure & flow)
- Pumps KW (Power varies due to running pressure & flow),
- Power factor improve from Load ends,
- Power quality (Harmonics reduction in stages from load end),
- Hot spots removal using Thermal Imager tool
- (in Electrical & Mechanical and in Production areas).

Mandatory Roof Top Solar needed now.

- Roof top Solar PV generation needs to be mandated on all DC.
- The DC after compliance with this PAT requirements and exercise, will become roll Model for other mills down the line.

- **This showcasing the DC strength in Energy Conservation, Energy Efficiency and in Renewable Solar within the premises, say the Three Aspects of Energy Pyramid by the DC**

- will act as Trump card in catalyzing the total MSME mills in textile segment.

Textile mills to adhere to PQ Norms now.

- Since the majority loads of mill is going from Linear to Non-linear,
- the Authority have to enforce the IEEE 519 norms dt 2014 regulations to the DC now.
- **The DC cannot dump their Harmonic waste to the National EB grid**.
- They have to strictly adhere to the norms stipulated by the CEA.
- Power quality is a compliance, but not for PAT.

Textile mill land area & Rain water harvesting.

- Compared to all the industry segments, the textile mill segment especially the spinning mills have a vast land area.
- Some mills have already done Roof water & Rain water harvesting by the Recharge pits and Ponds inside the mill area and
- Mills are totally managing the textile humidification water demand within the mill premises by this Rain water harvesting measures.
- The same needs to be monitored on-line and to plan to curtail the water consumption.
- Water Inventory need not come in TOE cals.

BEE Proforma is an excellent tool and carefully formatted taking care of all the internal and external variable factors

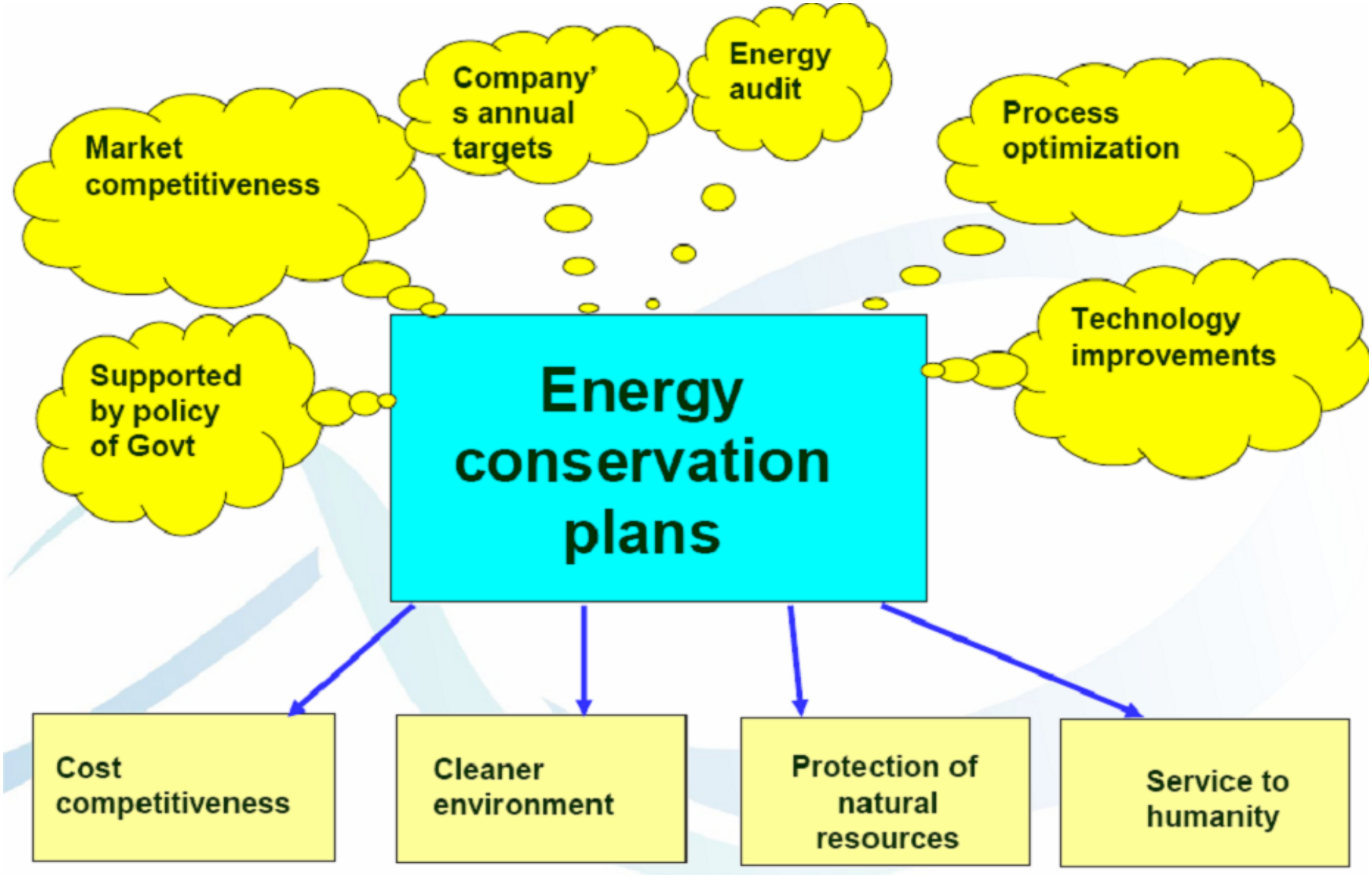
- The industry has to keep ready the Energy related information in the format mentioned by the BEE and the sector wise Proforma.
- BEE Proforma is an excellent tool and carefully formatted taking care of all the internal and external variable factors.
- Also each mill is talking about the total energy consumed only, but they do not relate this to production in each department wise.
- Macro-wise, they show outside, what they achieved, based on the Gate-to-Gate consumption-approach suggested by BEE.

Textile DC are achieving Energy Savings and converting them to increase production

- SITRA reports that Japanese Energy Efficiency increased in three fold from 1970s.

- That is, their industry production tripled till date, but their energy consumption stagnated and roughly flat all along till date.

- After conducting the PAT Baseline study in each DC recently, it is learnt that the mills have increased their production in Tons per day over the 4 years
- by achieving Energy Conservation in each year,
- but still maintaining the same levels of Energy Consumption
- and sometimes it has increased only proportionately.


Market competitiveness
Company' s annual targets
Energy audit
Process optimization
Supported by policy of Govt
Energy conservation plans
Technology improvements
Cost competitiveness
Cleaner environment
Protection of natural resources
Service to humanity

Let us Conserve ENERGY now for a Better Tomorrow !

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- for more practical energy saving Tips
- in the Home, Industry & Society.