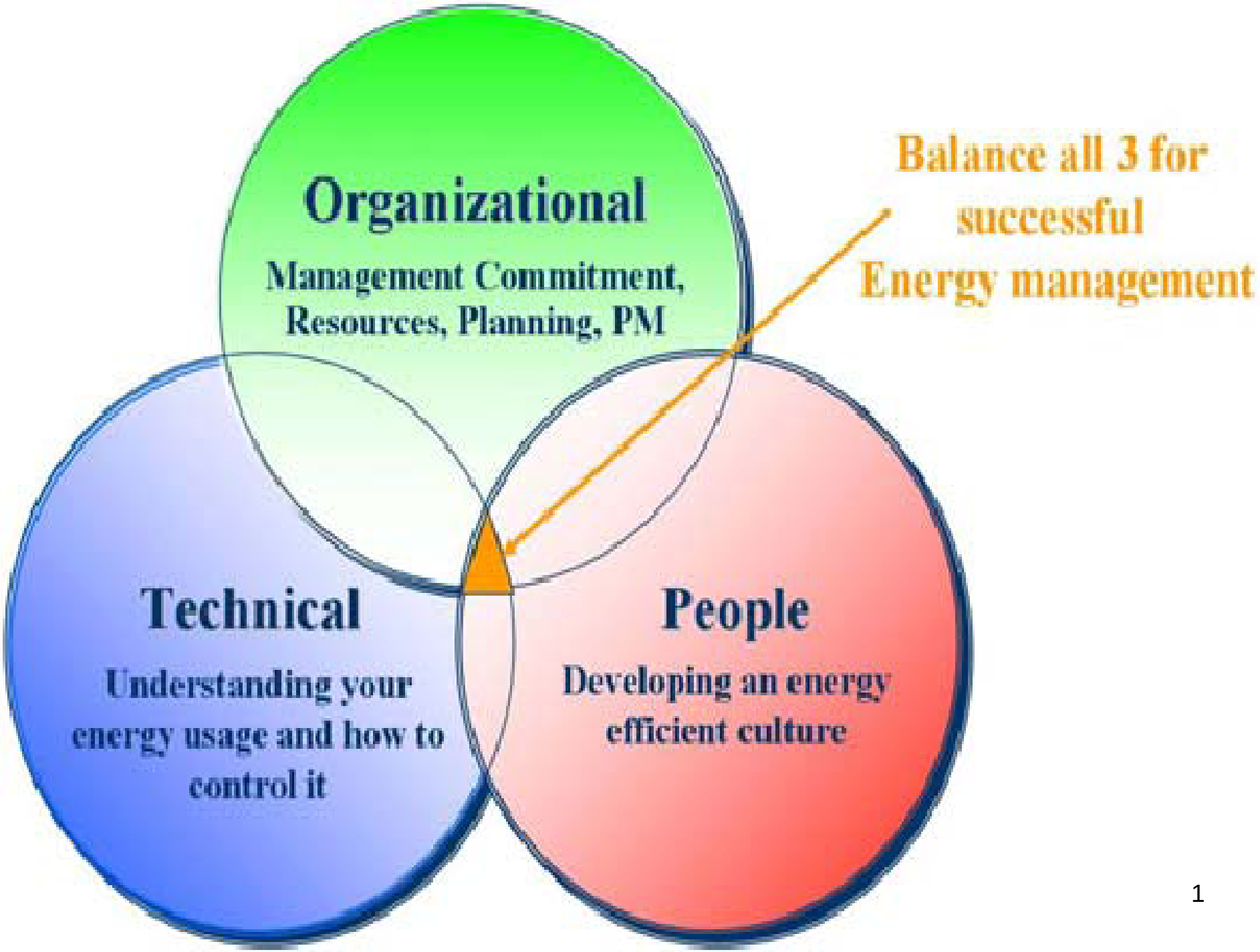
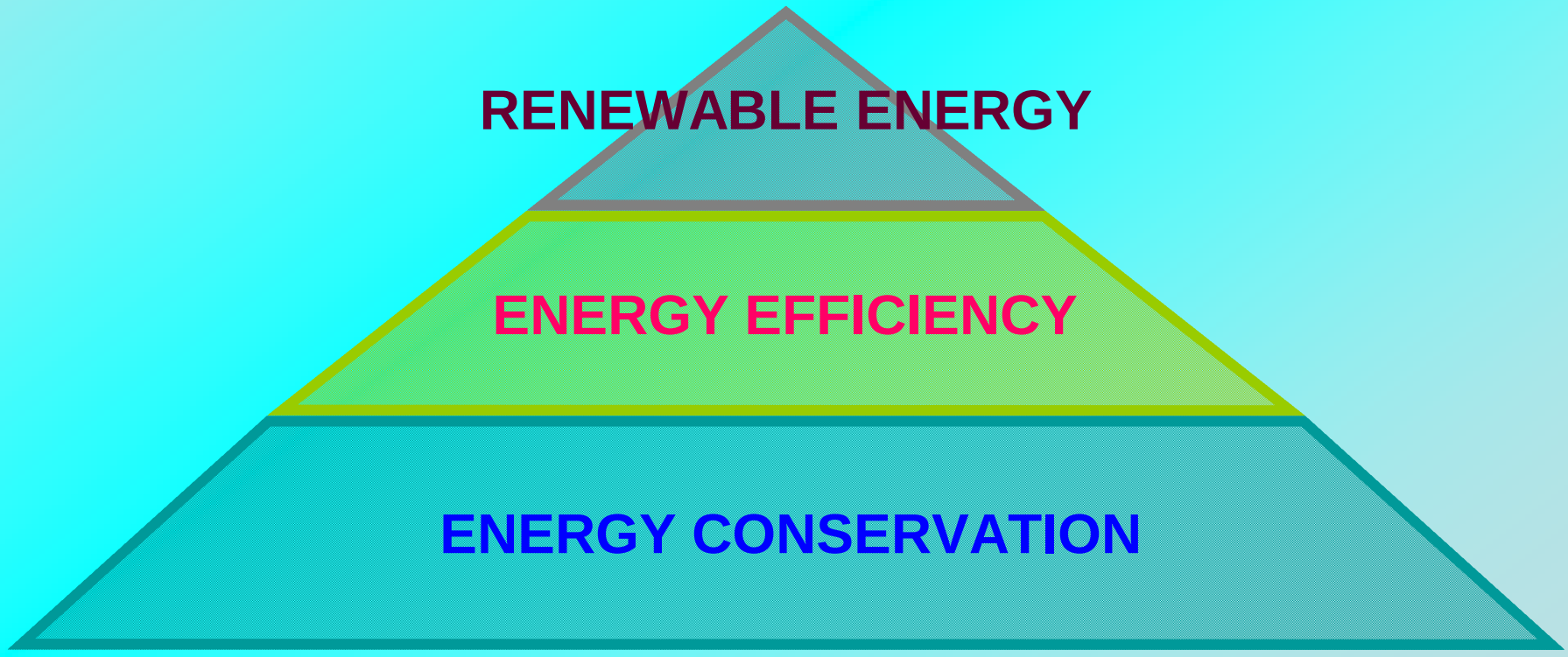

Organizational
Management Commitment, Resources, Planning, PM
Technical
Understanding your energy usage and how to control it
People
Developing an energy efficient culture
Balance all 3 for successful Energy management

ENERGY FOR THE FUTURE – WHAT WE PLAN TO DO NOW?

LET US WORK ON BOTTOM OF PYRAMID NOW

WITH FOCUS ON ENERGY EFFICIENCY EARLY NEXT,

& ALWAYS EYEING FOR RENEWABLE ALTERNATIVES



ENERGY CONSERVATION NOW,

IS THE COLLECTIVE

RESPONSIBILITY

FOR ALL OF US;

FOR A BETTER TOMORROW.

National Mission for Enhanced Energy Efficiency

Missions under NAPCC

- National Solar Mission
- **National Mission for Enhanced Energy Efficiency**
- National Mission on Sustainable Habitat
- National Water Mission
- National Mission for Sustaining the Himalayan Ecosystem
- National Mission for a Green India
- National Mission for Sustainable Agriculture
- National Mission for Strategic Knowledge for Climate Change

Energy, Efficiency, Equity and Environment

- The National Action Plan on Climate Change was released by Honorable Prime Minister of India in June 2008

  - The Action Plan Outlines **8 Missions** including National Mission for Enhanced Energy Efficiency (**NMEEE**)

- **The basic objective of the NMEEE mission is to ensure a sustainable growth by an approximate mix of 4 E's, namely-**
  - **Energy, Efficiency, Equity and Environment**

PAT – Energy Efficiency Mission Goals

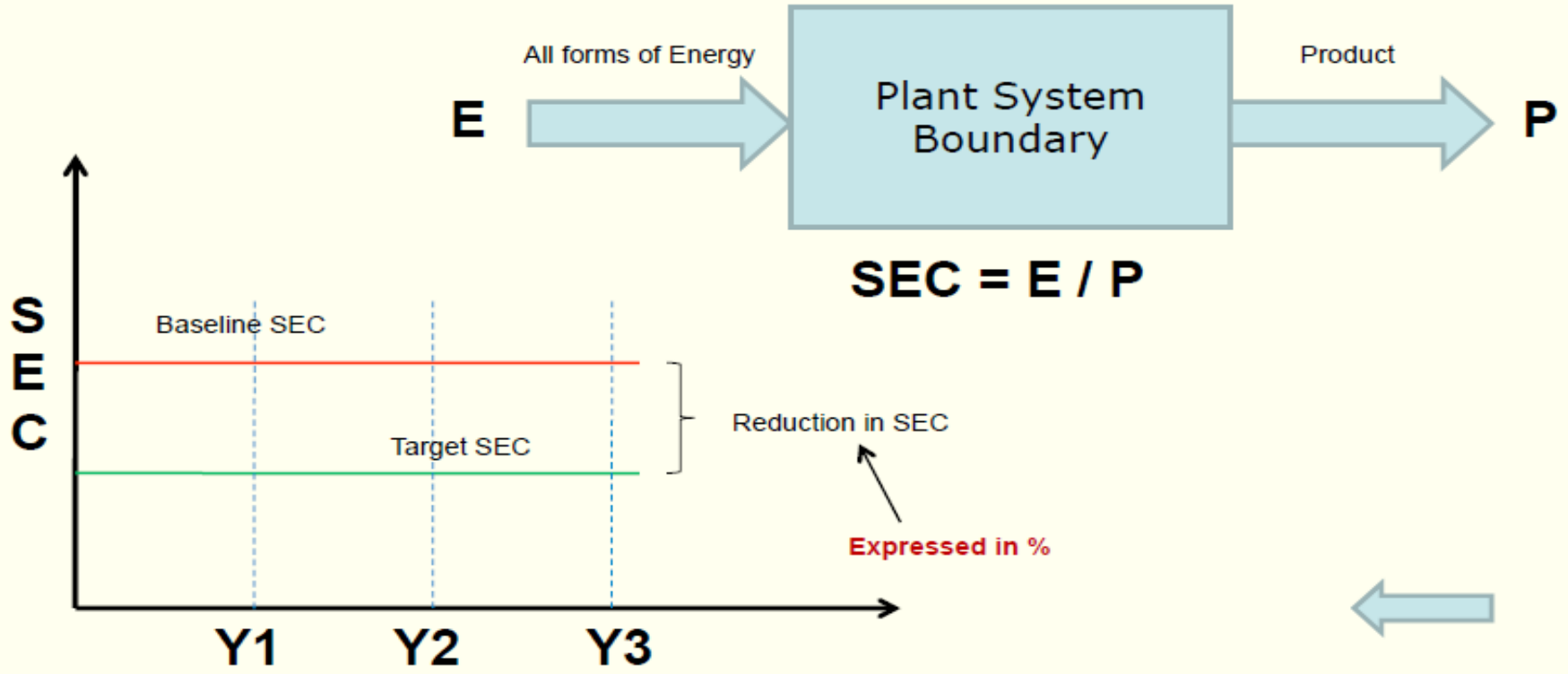
Mission Goals

- Market-based approaches to unlock energy efficiency opportunities, estimated to be about Rs. 74,000 Crores
- By 2014-15:
  - Annual fuel savings in excess of 23 million toe
  - Cumulative avoided electricity capacity addition of 19,000 MW
  - CO_2 emission mitigation of 98 million tons per year

TARGET - SEC – Year to Year reduction now

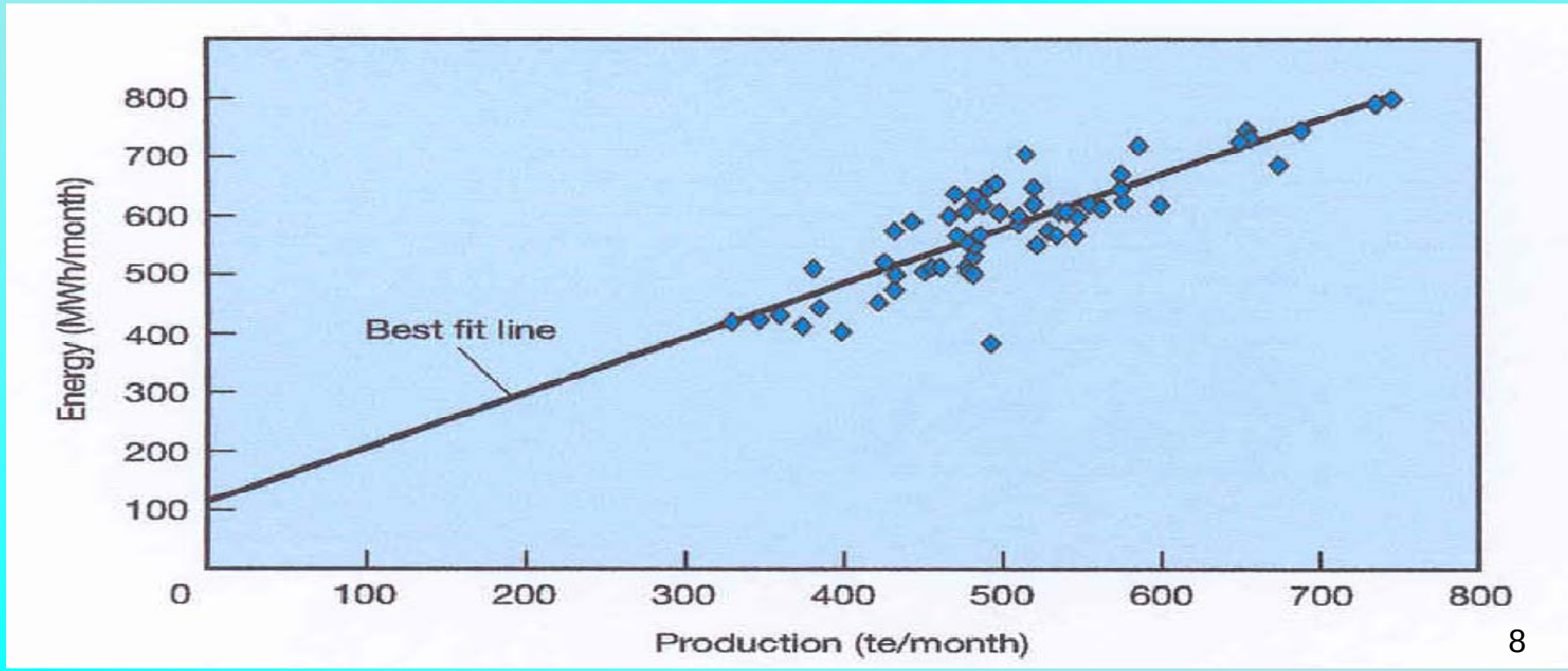
Target in PAT

Target is defined as the % reduction of 'Specific Energy Consumption (SEC)' from Baseline value.



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 BALANCE in India

- Decreasing Fuels & Industry Consuming More
- Thermal plants generate @ 35% Efficiency
- Transmission & Distribution Losses at 33 %
- 1 kg of coal Fuel gives one EB unit only
- Due to Energy Transportation losses end to end

Energy conservation = short cut to generate Power

- **Our beloved past President Dr.Abdul Khalam says : -**

- The cost of generation of 1 MW power is Many Crores of Rupees and takes longer months and years to generate.

cost of 1 MW power conservation -only less than Rs. 1 Crore

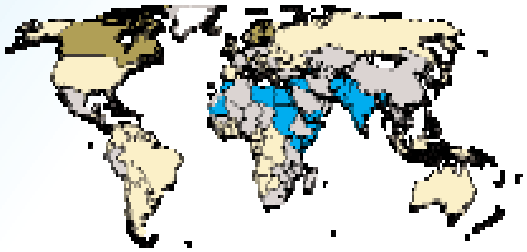
- If Conservation done in morning of the day, same evening we are reaping the rewards of our conservation efforts.

Energy Efficiency Benefits

Industry

- Reduced energy bills
- Increased Competitiveness
- Increased productivity
- Improved quality
- Increased profits !

Nation



- Reduced energy imports
- Avoided costs can be used for poverty reduction
- Conservation of limited resources
- Improved energy security

Globe

- Reduced GHG and other emissions
- Maintains a sustainable environment

Energy conservation – our collective responsibility.

- We all individually and collectively, account for each of unit of electricity consumed by us

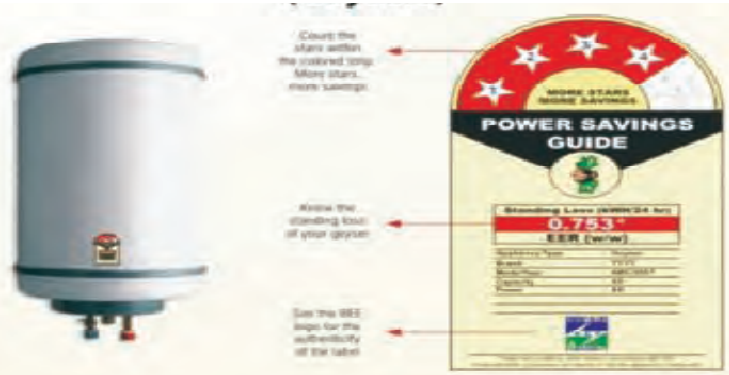
- as each unit of electricity had come to us by burning 1 Kg of coal elsewhere and after we consumed now,

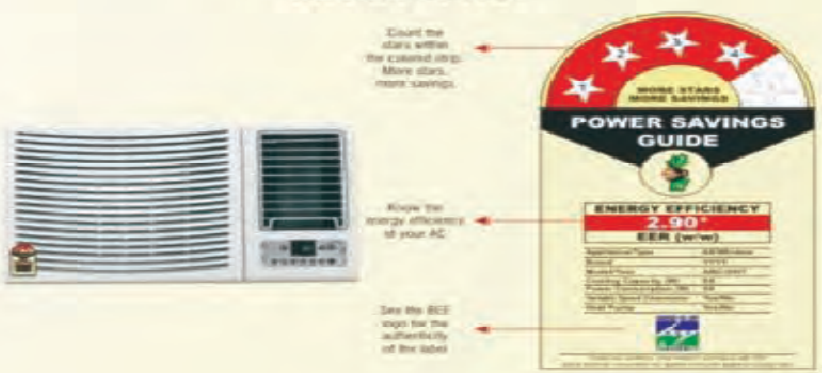
- Each unit of electricity we spend, we liberate 1 Kg of Carbon di-oxide, warming locally & in turn globally.

- So by the electricity conservation, we are saving 1 Kg of coal and we are reducing emission by 1 Kg 0f CO_2.

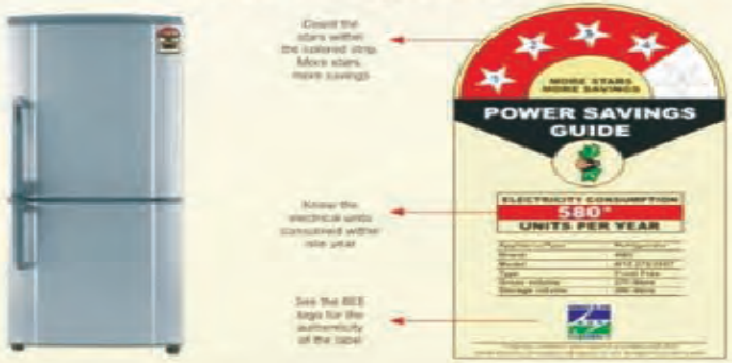
ENERGY-EFFICIENT DEVICES CAN SAVE RS. 1.2 LAKH CRORE ANNUALLY: ASSOCHAM

- Energy-efficient electrical appliances used in household
- and commercial establishments
- can save about 20,000 megawatt of power per year,
- resulting in savings of Rs. 1.2 lakh crore
- in capital investment on new power plants besides
- Transmission distribution infrastructure.



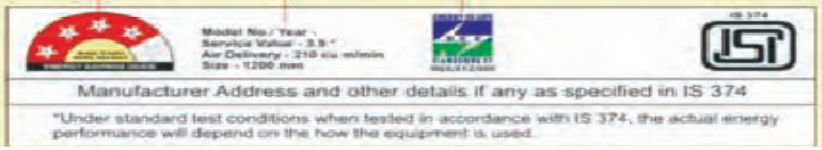


Label For Refrigerators



Label For TVs

Label For Ceiling Fans



Label For Tube Lights

BEE -Single star rated Fridge consumes 3 units / day.

Five Star rated Fridge consumes 1 unit per day

Energy and Cost saving for 250 Litres Frost Free Refrigerator at different Star Rating

Star Rating	Energy Consumption Per Year (Approx.)	Per Unit Charge Rs. (approx.)	Electricity Cost/Year In Rs.	Total Saving (w.r.t No star) Every year (Rs.)	Refrigerator Cost in Rs. (Approx.)	Cost Difference Rs.	Pay Back Period In Years
NO STAR	1100	2.50	2750	0	14000	0	0
1 (One)	977	2.50	2443	308	15000	1000	3.25
2 (Two)	782	2.50	1955	795	15500	1500	1.89
3 (Three)	626	2.50	1565	1185	16500	2500	2.11
4 (Four)	501	2.50	1253	1498	17500	3500	2.34
5 (Five)	400	2.50	1000	1750	18500	4500	2.57

Purchase cost to Running cost

When we buy motor cycle for Rs.50,000, monthly petrol cost & expenses run for1000 km in a month = Rs.2000/-

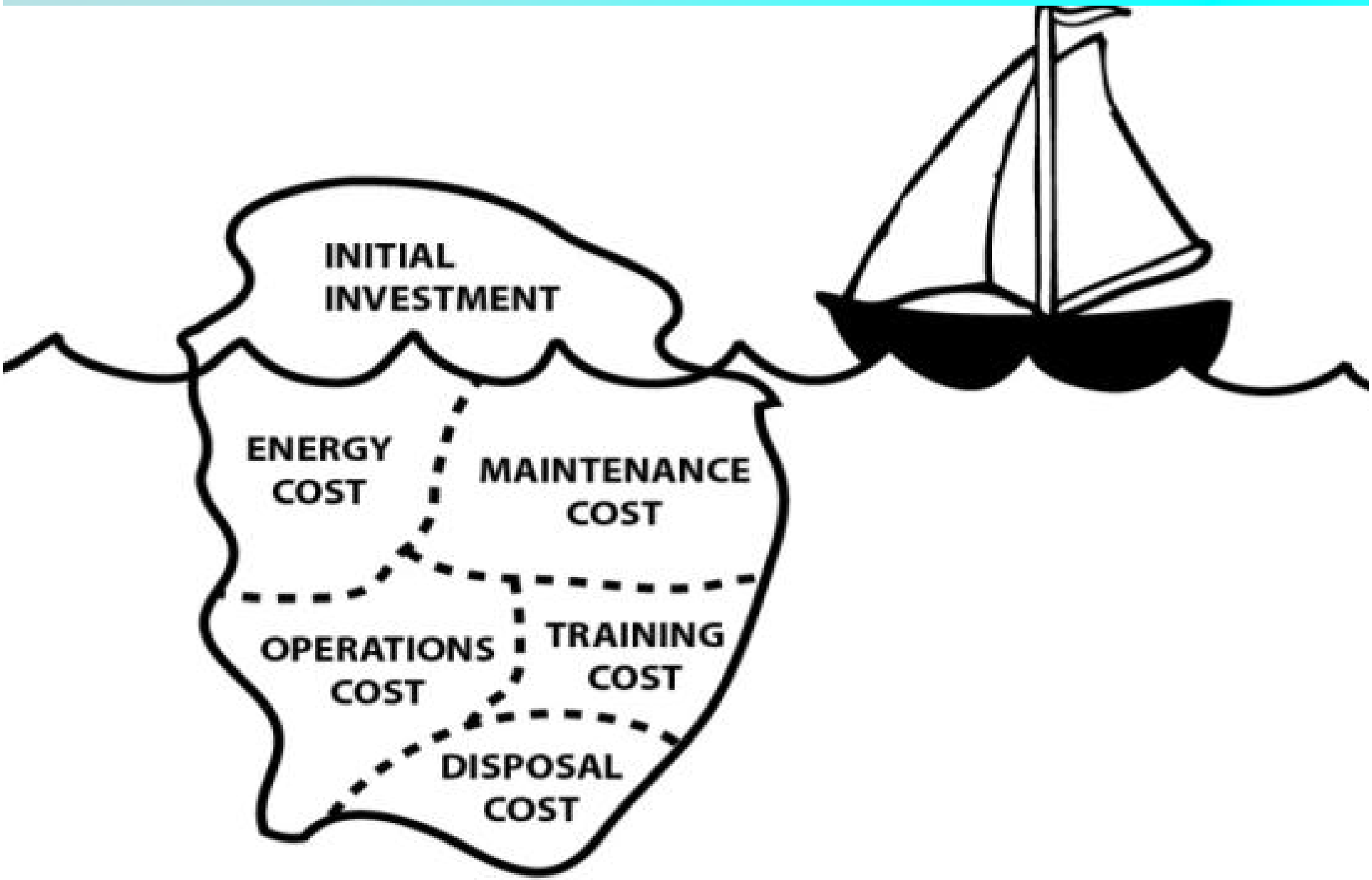
When we buy 20 hp motor for Rs.50,000,
our monthly motor power bill is Rs.40,000/ to Rs.50,000/-

Life cost of a motor is often over 100 times the purchase cost

Every time a motor is rewound, its efficiency drops by 2%

Every 10°C drop in inlet air temperature will lead to a 2% saving in fuel costs

The essence of life cycle costing



- **Practically we use mid position 3 in our ceiling fans.**
- **BLDC fan consumes only 11 Watts compared to 46 Watts.**
- **That is ONLY 25 % power of our ceiling fan consumption.**

Knob Position	1	2	3	4	5
Old Fan Watts	18	33	46	56	67
BLDC Fan Watts	3	6	11	20	31

IMG_0353

Be Cool With It!

EESL will start distributing the energy-efficient fans next month

4 Cos which qualified to bid for distributing the fans

Cos quoted bids in range of ₹955-1,050 a piece

₹955 Price of 5-star fans

₹1,900 Price of branded five-star-rated fans in the market

These fans consume 45 watts against 75 watts by conventional fans

₹100 Amount consumers will pay upfront to enrol for the scheme

The pilot fan distribution plan will be launched in Andhra Pradesh with a two-year instalment scheme

Rest will be recovered in 24 monthly instalments that could be as low as ₹50

The move towards Air Conditioner
Fan consumes 20 times less power than a AC.
If at all we need AC strictly only, then to use it sparingly.

Room conditions	Energy Demand	Energy Consumption	CO_2 emission
Air movement	9 W/m^2	15 kWh/m^2	20 kg/m^2

Room conditions	Energy Demand	Energy Consumption	CO_2 emission
29 ^{o} C/ 70 % RH	39 W/m^2	70 kWh/m^2	90 kg/m^2

Room conditions	Energy Demand	Energy Consumption	CO_2 emission
24 ^{o} C/ 60 % RH	194 W/m^2	244 kWh/m^2	310 kg/m^2

TREES HELPS US TO REDUCE AMBIENT TEMPERATURE

The tree adjusts the temperature so air conditioning is not needed

System Energy losses viewed from Input KW to motor

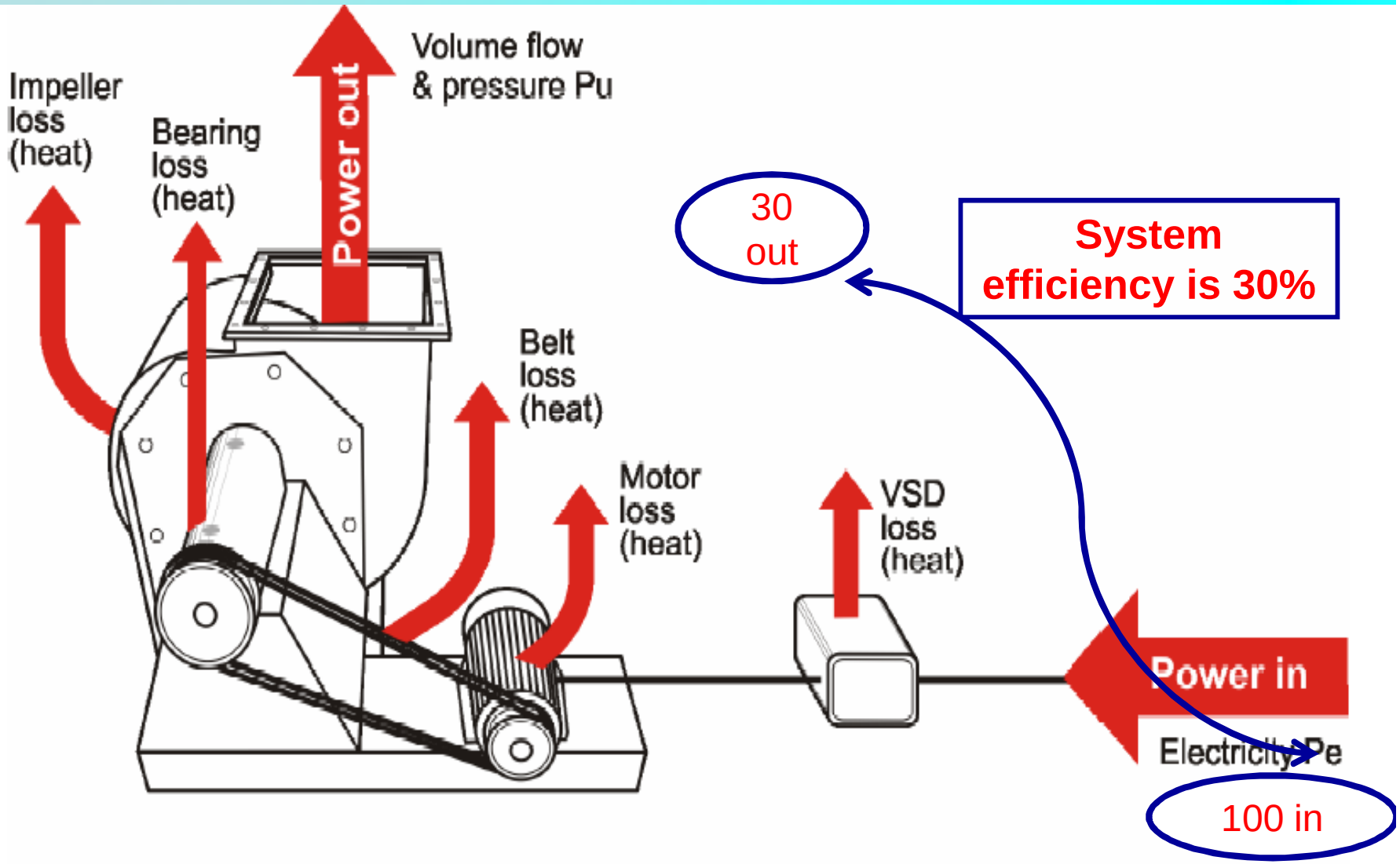


Diagram showing the losses from a fan system including VSD, motor and belt drive.

Pumping system – savings

parameters	existing’	new pump
Motor rating hp	**7.5**	**5**
Suction pipe mm	65	75
Delivery pipe mm	50	75
Piping material	GI	White PVC
Foot valve	local	ISI
Discharge LPS	3.68	5.03
Input power KW	**6.18**	**4.35**
Increase in discharge	--	36.7 %
Input power reduction	29.66 %	--
Saving in Energy	**--**	**48.44 %**

CASE STUDY 5 STAR rated AGRI PUMP REPLACEMENT

- BEE decided to swap old inefficient Agricultural pump with 5 star rated pump to save up to 40 % power.
- 3500 pumps to replace in 6 months project cost Rs.7 Crores
- Pump OEM committed cumulative energy savings of 36 % PA over 5 years
- Cost of pump Rs.20,000/- includes the dismantling the existing pump set, procurement & installation.
- For maintenance and repair / replacement for 60 months provided free of cost to farmers.
- Rate of return = Rs.7200/- Hassle free investment of Rs.20,000
- ROI – Return on Investment say Rs.1000 in one year = Rs.360
- News Item as appeared in Economic Times Newspaper.

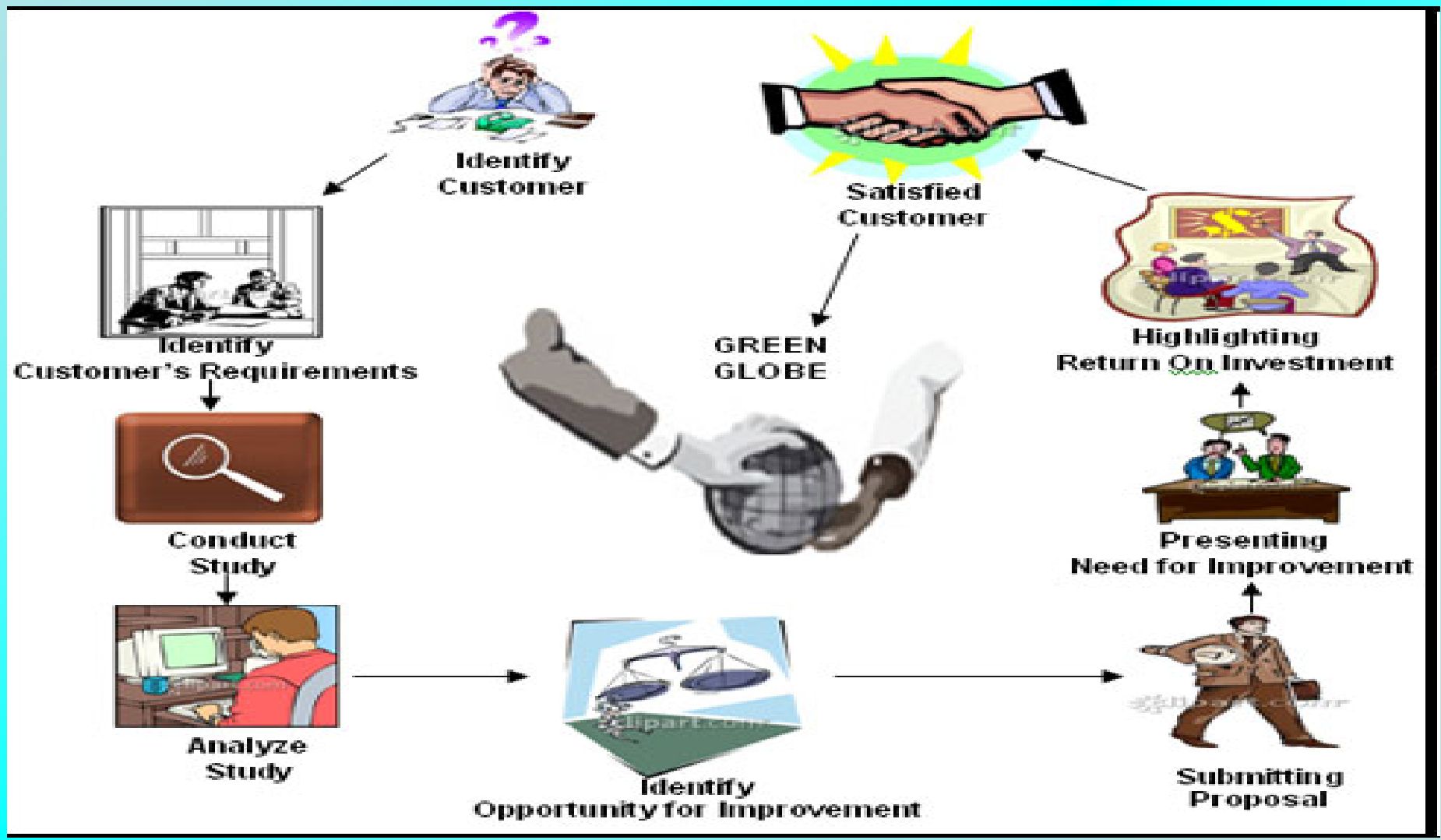
ROOF Rain WATER HARVESTING in Industry

- Compared to other industry, textile mill is built in huge land area. The same can be utilized and go for rain water harvesting pond.
- Some textile mill have gone 50 Lac liter pond which is just a collection of rain water inside the premises and predominantly the roof water collected and brought to pond.
- This pond serves the mill for the whole year the excellent rain water collected from roof & surroundings, with lowest TDS to the mill AC plant and thus helps the mill to sustain thro out the year with no need of RO / external water resource
- but with the God given rain thro roof water collections only.
- By this, the textile mill can improve the ground water levels in the locality where they are located.

Automation – a Tool to improve productivity with less power consumption

- Automation with Human intervention even Semi-auto.
- Reduction of Peak Loads
- Environment Protection.
- Improve Safety and Health.
- Easy diagnosis of fault & Reduce Maintenance.
- Minimize Energy consumption
- Reduction in Resources(water , energy etc.)

Energy Auditor to team up with Industry Management, Production and Maintenance teams to catalyze & implement *Energy Conservation Measures.*



Safe & Best operating practices Automatically yield Energy Savings along with better machines' health

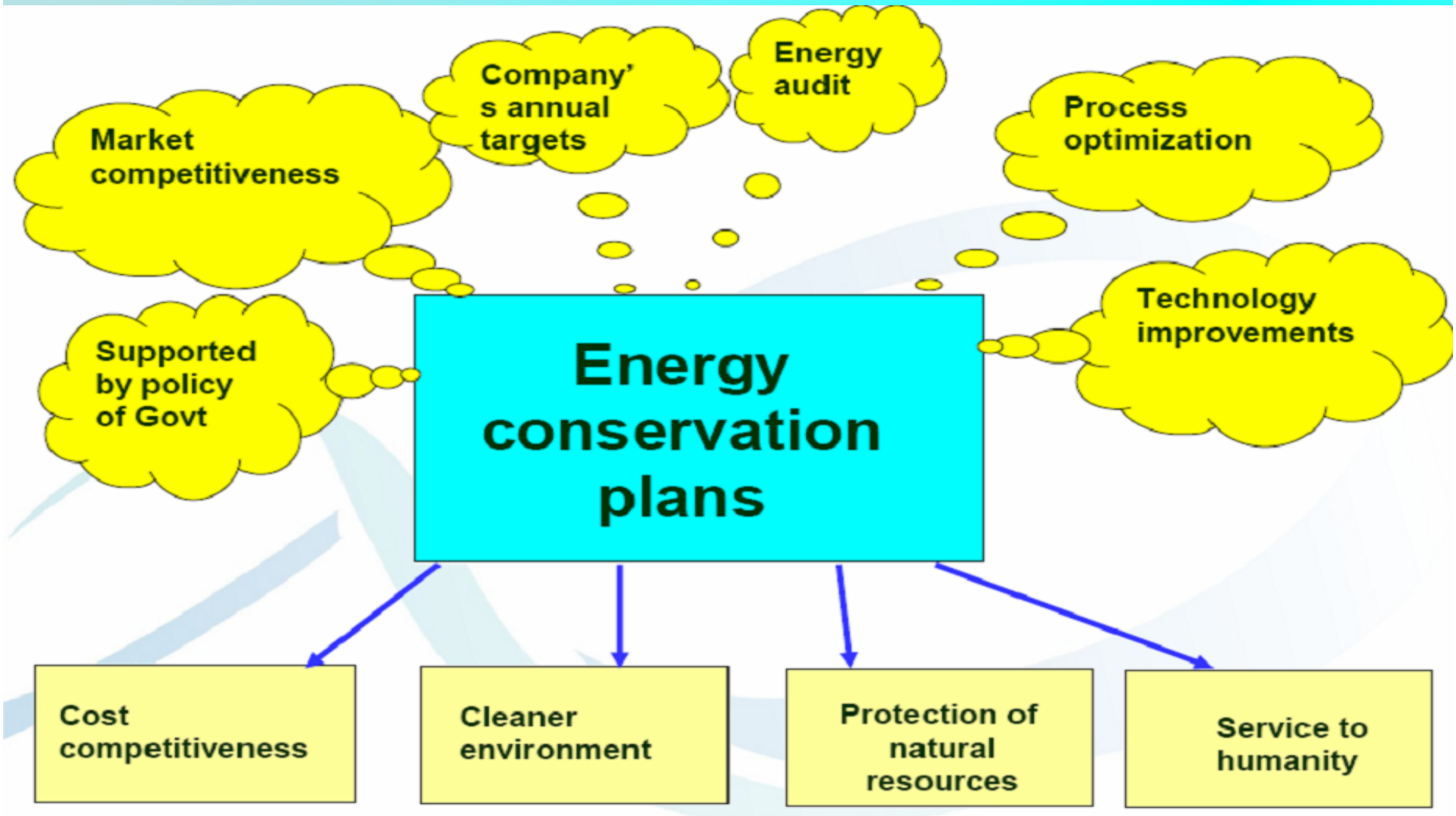
- Thinking & Acting on Conservation Measures
- catalyzes our social responsibility,
- caring for others and sacrificing our selfish comforts.
- When we are safe and healthy, conservation prevails.
- If safety fails, conservation fails and Pollution starts.

ECON is a Low Hanging Fruit now.

If left un-plucked now, this will silently eat your OPM, the operating profit margins sooner & later too.

- **Having done Energy audit in the industry now,**
- **we have given 5 to 10 % savings with few months Payback**
- **If your Power / Fuel Bill runs in Many Crores of Rs. pa,**
- **you could save up to 10 % thro better energy practices**
- **ASK YOURSELF**
- **How much products to sell to earn Rs.2 CRORE net / year**
- **This 2CRORE Rs is within yourself and make use of it NOW !**

ECON PLAN – SHALL WE SAVE ENERGY !
TO IMPROVE HEALTH OF US & SURROUNDINGS !!



Comparison between ISO 50001, ISO 9001 and ISO 14001

- ISO 50001 is based on the same Plan-Do-Check-Act approach of ISO 9001 and ISO 14001
- and it draws extensively on the structure and content of the QMS and EMS.

- Implementation of ISO 9001 means what the organization does to fulfill the customer's quality requirements,
- and applicable regulatory requirements, while aiming to enhance customer satisfaction,

- Implementation of ISO 14001 means what the organization does to minimize harmful effects on the environment
- caused by its activities, and to achieve continual improvement of its environmental performance.

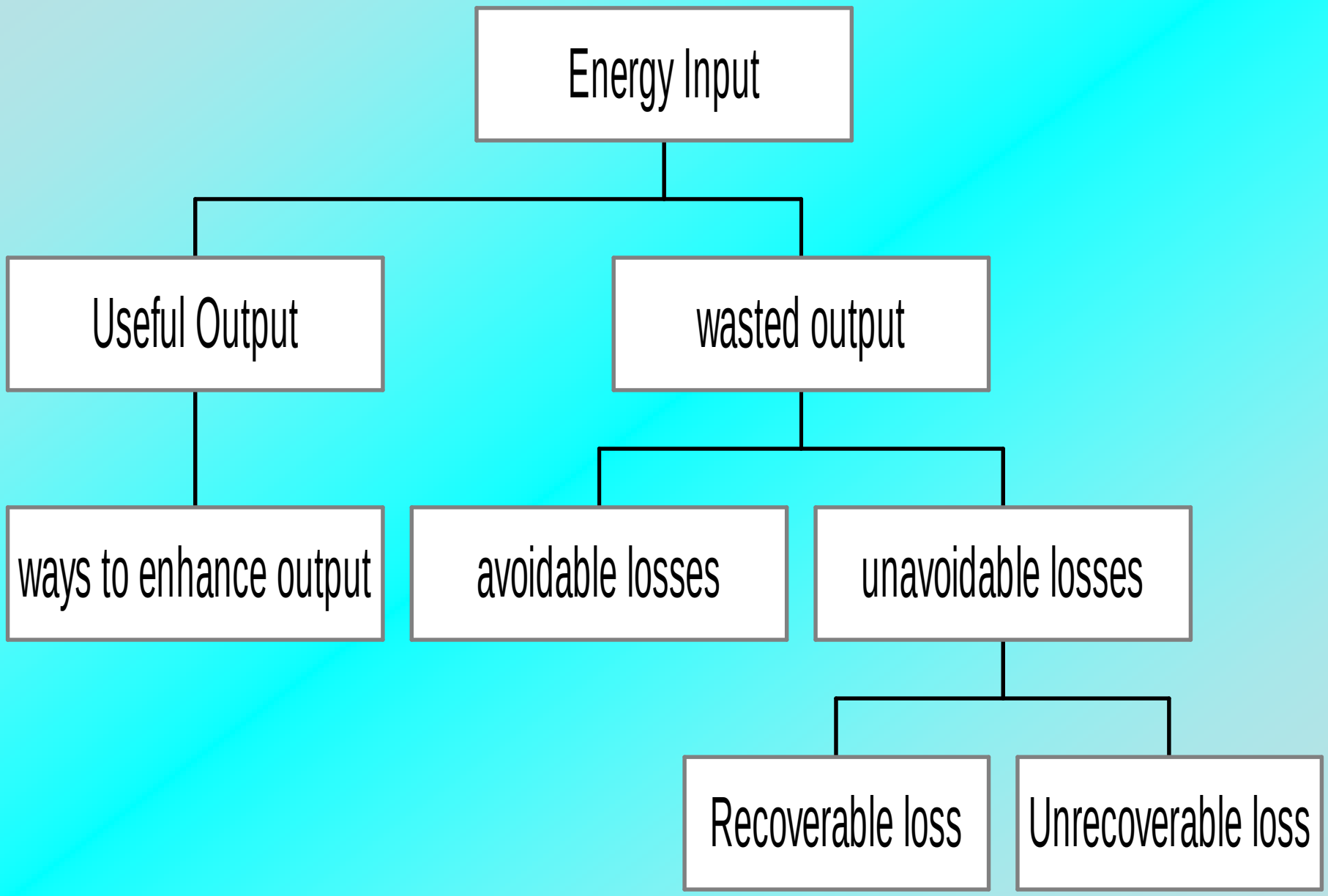
Necessity of Energy Management

Energy Management is necessarily required

because it influences a number of aspects of company operation and activities including the following:

1. - energy costs which affect the company profitability
2. - energy costs which affect market competitiveness
3. - local and global environments
4. - occupational safety and health
5. - loss prevention and waste disposal reduction
6. - productivity
7. - quality

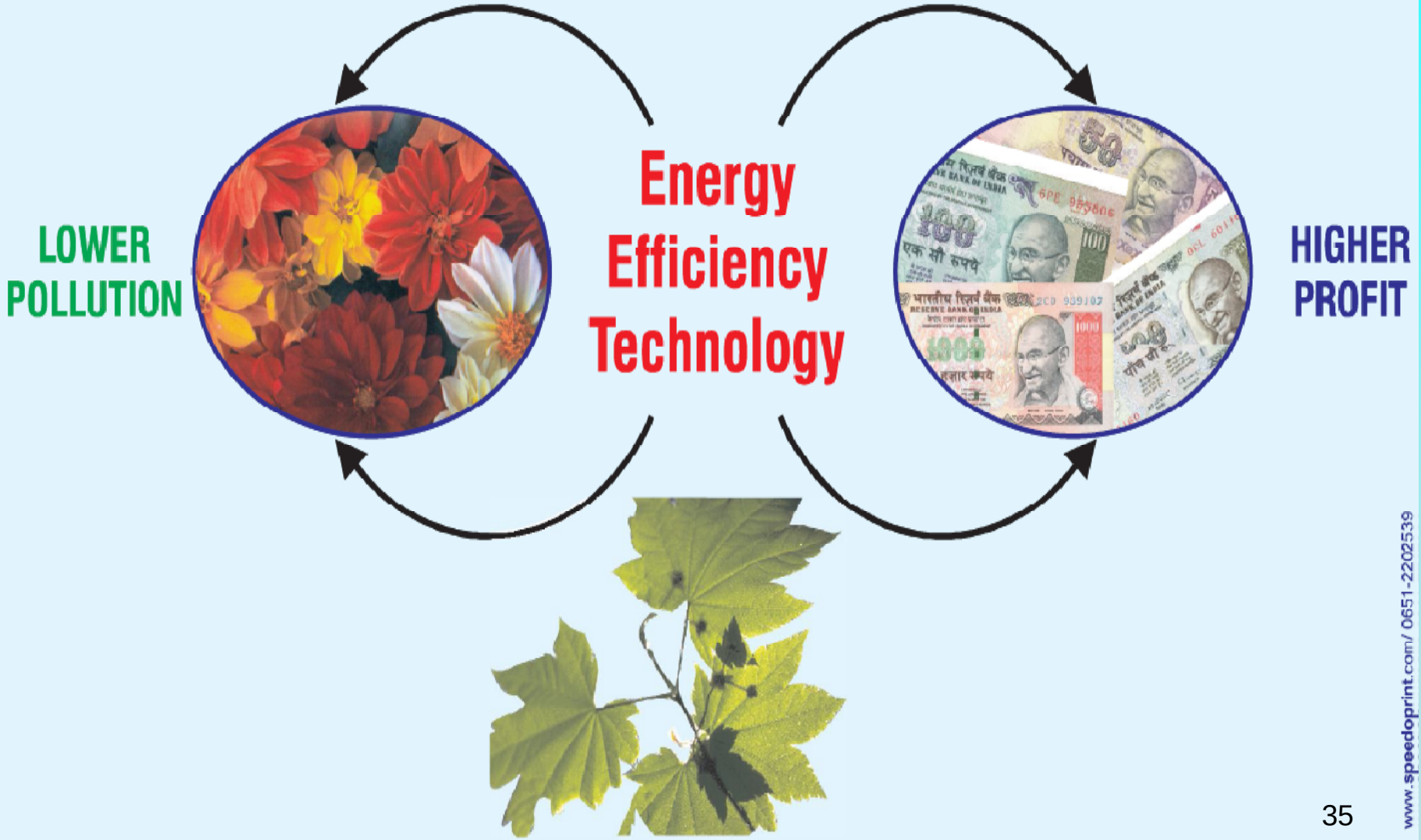
ENERGY AUDIT



Energy Audit Indicates you

- What to do,
- where to start,
- at what cost and
- for what benefits
- Indicative saving potential to achieve
- Good House-keeping yields 5-10%
- Minor Investment gives 10-15%
- Reasonable Investment pays back 20-25%

Be energy efficient to gain higher profits and keeping only lower pollution



FIVE COST REDUCTION MEASURES OF ENERGY CONSERVATION

- Identify inefficient energy use
- Upgrade machinery & process in context of energy efficiency
- Improve maintenance practice
- Promote employee awareness and
- Conservation in domestic consumption.

FOUR FUNDAMENTAL WAYS OF SAVING ENERGY:

1. Accurate monitoring of the utilities in plant.

2. Reduction in the amount of Energy required for the generation and use of the utility.

3. Trapping of any unused energy

4. Recycling and use of energy over & again.

Energy conservation details in Annual Report

ANNEXURE 'A' TO DIRECTORS' REPORT

Particulars of Conservation of Energy, Technology Absorption and Foreign Exchange,

A. Conservation of Energy:

Efforts to conserve and optimise the use of energy through operational methods and other means are continued,

Significant Initiatives

- Use of Indian Energy Echange (IEX) power has resulted in savings of Rs,1,10 crores,
- Replaced axial fan with new energy efficient fan impeller of 44KW in place of 55KW and saved 20% power in Waste Collection System.
- Installed Timers for waste collecting cyclone motor to run 30 minutes on and off instead of continuous running thereby power saving of 50%.
- Arranged 20W LED tubes in place of 40W tubes for 24 hours lighting in Spinning Depart-ment.
- Installed 2000 KVA energy efficient transformer
- Optimised usage of Air Compressors

Safe & Best operating practices Automatically yield Energy Savings along with better machines' health

- Thinking & Acting on Conservation Measures
- catalyzes our social responsibility,
- caring for others and sacrificing our selfish comforts.
- When we are safe and healthy, conservation prevails.
- If safety fails, conservation fails and Pollution starts.

Thank you for your kind attn Pls!

Please Feel Free to ask More Questions!!

- **S.ASHOK, BEE Accredited Energy Auditor /**
- **Chairman IAEMP Coimbatore Chapter.**
- **POWERON Projects / Coimbatore / 94437 20220**

ashok@energymeasuretosave.com

Please visit :- www.energymeasuretosave.com

- **we take pride on saving Electricity, LPG in house.**
- **Conservation is a Habit and begins at Home only.**
- ***As Conservation is all about***

our collective responsibility for better tomorrow.