

Energy Audit

A Key to Conservation and Preserving Energy

December 1990

This is an Energy Audit covering most of the areas applied to a manufacturing unit. The subjects are arranged in an alphabetical order and provisions are made to same more aspects at the end of each area. There are also a few pages given to add more areas. When audit is being done, many aspects which are not covered may come out that may be covered either by using the space provided or fresh pages may be inserted.

Energy in the form of heat, electricity, fuel, mechanical horsepower and material or in any other form is not only a scarce resource but one of the primary resource for the industry and life. The purpose of this Energy Audit is to help the Engineers, Technologists and Scientists serve the industry by conserving and preserving the energy with effective and efficient work and reserving the optimal energy for future.

The audit must be by a team of atleast two: one from outside the area concerned and one from inside the area concerned. Thus, Integrity, Experience and Exposure – a tradition and fresh air.

ENERGY EFFICIENCY AUDIT - CHECK – LIST

PLANT NAME: _____

DATE: _____

Sr. No.	Aspect	Being done	Not done	Do not know	Action by
AIR CONDITIONING					
A.1	Turn off out of working hours.				
A.2	Check on size of air handling grills and ducts to minimise resistance.				
A.3	Keep ductwork clean.				
A.4	Maximise recycling of air-conditioned air.				
A.5	Turn-off 1/2-1 hour before work place is vacated.				
A.6					
A.7					
BOILER PLANT					
B.1	Minimise boiler blow-down through				
B.2	Maximise condensate returned.				
B.3	Check flue gases for optimum CO ₂ /O ₂ content & temperature.				
B.4	Check boilers are matched to requirement and are not running below capacity.				
B.5	Maintain plant thoroughly.				
B.6					

Sr. No.	Aspect	Being done	Not done	Do not know	Action by
COMPRESSED AIR					
C.1	Eliminate leaks in distribution system.				
C.2	Clean or replace air filters regularly.				
C.3	Remove unnecessary lines to eliminate potential leaks.				
C.4	Install adequate dryers on air lines.				
C.5	Install compressor air intake in coolest possible locations.				
C.6	Reduce compressed air pressure to the minimum required.				
C.7	Use filters or electrostatic precipitators for cleaning air prior to intake.				
C.8	Use waste heat from compressors as space heat.				
C.9	Renew valves, rings and glands on compressors regularly.				
C.10					
DIESEL AND PETROL ENGINES					
D.1	Turn-off lift trucks etc. When not in use.				
D.2	Adjust and maintain lift trucks etc. For most efficient operation.				
D.3	Maintain lorries at regular intervals.				
D.4	Shut-off lorry engines while loading or unloading.				
D.5	Reduce business travel by using telex or telephones when possible.				
D.6					
D.7					
ELECTRICAL EQUIPMENT					
E.1	Check the size of electrical motors for peak operating efficiency.				
E.2	Provide proper maintenance and lubrication for motor driven equipment.				
E.3	Reduce transformer losses by de-engineering when possible.				
E.4	Keep bus-bars as short as possible, joins should be clean and sound.				
E.5	Switch-off when not in use.				
E.6	Use higher voltage where possible to reduce transmission loss.				
E.7	Constantly monitor power factor of whole plant and correct when too low.				
E.8	Monitor maximum demand on electricity and reduce wherever possible.				
E.9	Ensure that electricity is being supplied under the most suitable tariff.				
E.10					
E.11					

Sr. No.	Aspect	Being done	Not done	Do not know	Action by
FURNACES					
F.1	Investigate possibility of using recovered waste heat to pre-heat combustion air or fuel to generate heat for the plant.				
F.2	Repair faulty insulation especially around apertures.				
F.3	Ensure that seals are efficient.				
F.4	Adjust and maintain burners for efficient operation.				
F.5	Check for constant correct fuel and air pressure.				
F.6	Monitor for correct fuel/ air ratio by analysis of stack gases.				
F.7	Install dampers; check that they function correctly.				
F.8	Ensure burners are correct size for duty required.				
F.9					
F.10					
GROUND AND BUILDINGS					
G.1	Seal windows and doors to prevent draughts.				
G.2	Eliminate all unnecessary openings.				
G.3	Cut air changes to minimum.				
G.4	Ensure that large exterior doors remain shut whenever possible.				
G.5	Install self closing personnel doors adjacent to truck doors to minimise heat loss.				
G.6	Use heat exchanger to transfer heat from exhaust air to make up air.				
G.7	Use re-circulating fans to draw hot air from ceiling area and redistribute it at floor level.				
G.8	Disconnect water coolers and vending machines during non-working hours.				
G.9	Ensure security lighting is switched-off during daylight hours.				
G.10	Reduce domestic hot water temperature to minimum.				
G.11					
G.12					
HEATING					
H.1	Reduce hot water temperature to minimum required.				
H.2	Control heating thermostatically and turn down when not in use.				
H.3	Use waste heat for space heat wherever possible.				
H.4	Reduce heating system temperatures. The legal minimum is 10°C.				
H.5	Turn heating off ½-1 hour before work-place is vacated.				
H.6	Re-circulate warm air from roof space.				
H.7	Heat spots rather than whole areas.				
H.8	Ensure that heating is off when work-place is not in use.				
H.9	Ensure that all fan heaters are maintained regularly.				
H.10					
H.11					
H.12					

Sr. No.	Aspect	Being done	Not done	Do not know	Action by
LIGHTING					
L.1	Keep windows as clean as possible.				
L.2	Install timers on light switches in little used areas.				
L.3	Convert to fluorescent, sodium or multi-vapor direct lighting where possible.				
L.4	Use photocell control on outdoors lights.				
L.5	Keep lighting fixtures clean.				
L.6	Turn-off light on days when natural light is sufficient.				
L.7	Appoint someone in each area to make sure that light are on only when necessary.				
L.8					
L.9					
MISCELLANEOUS					
M.1	Reduce scrape production.				
M.2	Ensure that all equipment is adequately lubricated to ensure smooth running.				
M.3					
M.4					
Ovens					
O.1	Use hot air for space or water heating.				
O.2	Ensure that insulation is complete and of a high standard.				
O.3	Eliminate unessential material in heat treatment process, i.e. Trolleys, trays, containers.				
O.4	Ensure doors seal efficiently.				
O.5	Only open doors when absolutely necessary.				
O.6					
O.7					
PROCESS EQUIPMENT					
P.1	Attempt to recycle used oil.				
P.2	Automate wherever possible.				
P.3	Ensure hot tanks are insulated and have well fitting lids.				
P.4	Keep air agitation in tanks as low as possible.				
P.5	Ensure that there is accurate thermostatic control of tanks and baths and that controls are set to a minimum level.				
P.6					
P.7					
REFRIGERATION					
R.1	Do not waste water for refrigeration use cooling water.				
R.2					
R.3					

Sr. No.	Aspect	Being done	Not done	Do not know	Action by
STEAM DISTRIBUTION					
S.1	Ensure full insulation on steam and condensate lines; consider increasing thickness of thin insulation.				
S.2	Repair faulty steam traps.				
S.3	Return hot condensate to boiler plant.				
S.4	Repair all steam leaks.				
S.5	Remove unnecessary steam lines.				
S.6	Do not blow flash steam to waste.				
S.7					
S.8					
TREATMENT OF EFFLUENT					
T.1	Ensure that drainage from finishing plant is treated; pouring down a drain is a waste of money.				
T.2					
T.3					
VENTILATION					
V.1	Adjust ventilation to optimum working level (two air changes per hour are usually sufficient.)				
V.2	Eliminate unnecessary draughts.				
V.3	Ensure even ventilation throughout the building.				
V.4	Check for leaks in ducting.				
V.5	Only open doors when absolutely necessary.				
V.6					
V.7					
WATER (CLEANING & COOLING)					
W.1	Use cooling towers rather than mains water for cooling.				
W.2	Re-circulate purified water from effluent plant whenever possible.				
W.3					
W.4					