Phase 1

Step 1 : Plan, walkthrough, Interview with Energy Manager.
Step 2: Conduct of brief meeting/ awareness programme.

Phase 2

Step 3: Data gathering, flow diagram & other diagrams.
Step 4: Survey & monitoring.
Step 5: Conduct of detailed trials/experiments.
Step 6: Analysis of energy use.
Step 7: Identification of E.C opportunities.
Step 8: Cost benefit Analysis.
Step 9: Reporting & Presentation.

Phase 3

Step 10: Implementation & follow up.

Role of Energy Managers:

① Prepare an annual Activity Plan and present to management.
② Establish Energy Conservation cell within the firm.
③ Initiate activities to improve monitoring and reduce costs
④ Analyse equipment performance.
⑤ Ensure proper functioning of instruments.
⑥ Prepare info. material and conduct internal workshops.
⑦ Improve disaggregating of energy consumption.
⑧ Establish methods on how to calculate energy consumption.

→ Transportation sector:

(*) Consists of all vehicles. Primary purpose is transporting people/goods.

Eg. trucks, buses, trains, ships, etc.

→ Industrial sector:

(*). Consists of all facilities and equipments used for producing, processing or assembling goods.

Eg: agriculture, mining, construction, etc.

→ Residential sector:

(*). Consists of living quarters for private households.

Eg: Heater, Air conditioner, etc.

→ Commercial sector:

Eg. Street lighting, water & sanitary services, etc.

→ Electricity sector:

(*). Sector that generates electricity.

Energy Past and Present Scenario:

→ International Energy Agency (IEA) publishes yearly comprehensive energy data.

→ Energy production is 80% fossil.

→ India is the third largest producer of electricity in the world.

→ India's energy sector is dominated by fossil fuels, in particular coal.

→ Sectorial Energy Conservation: (*) Energy Intensity calculated at sector level.

(*). When source energy is considered, energy is calculated for 5 sectors: four end user and one electricity producing sector.

(*). When total energy is considered, energy is calculated for 4 end user sectors only.

*End use sectors: (a). Residential (c). Industrial

(b). Commercial (d). Transport

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Instruments

a) Electrical Measuring Instruments

↳ for measuring electrical parameters such as KVA, KW, PF, Hertz

↳ applied on line i.e on running motors without the need to stop

↳ measures harmonics

b) Combustion analyser

Instrument has inbuilt chemical cells for measuring gases such as O_2, CO, NO_x, SO_x

c) Fuel efficiency Monitor

↳ measure oxygen & temperature of the flue gas

↳ calculates combustion efficiency

- **Contact Thermometer**
  - These are thermocouples
  - measures for the gas, not air, not water by probe.

- **Infrared Thermometer**
  - Non contact type measurement which directly gives reading when directed at heat source.

- **Leak Detectors**
  - detect leaks of compressed air
  - These leaks are not possible to detect with human abilities

- **Lux Meters**
  - illumination levels
  - consists of a photocell.