



Energy Saving Guide

**(Based on 10+ years of experience in Energy Audit
across Industries)**

Enerco Energy Solutions LLP



Phone : 022 42643671
Mobile : 09890737447

Email : solar@econserve.in
Website : www.econserve.in

Content

I. About Energy Audit

II. Top 3 Energy Saving Areas

III. Conclusion

Enerco Energy Solutions LLP



Phone : 022 42643671
Mobile : 09890737447

Email : solar@econserve.in
Website : www.econserve.in

I. About Energy Audit

Energy Audit is a periodic and necessary exercise carried out by manufacturing and processing units by hiring experts in this field. The audit ensures that the plant is efficiently using its energy resources – electrical power, coal, oil, gas etc.

The subject of energy efficiency is dynamic due to a variety of factors. We have observed that many a time energy efficiency opportunities arise due to the following :

1. Upcoming newer technologies for better control and optimization of resources.
2. Overlooking energy saving opportunities within the plant due to core business priorities.
3. Plant expansion and brownfield projects.
4. Ageing plant which in itself presents the opportunities in pockets within the plant.
5. No energy audit carried out for a longer duration (3+ years) or no energy audit carried out ever.

Due to this it is almost always possible to identify new energy saving opportunities within a particular plant. It is thus no wonder that energy-intensive sectors such as Coal based Power Plant, Steel, Cement, Chemicals, Metal etc. carry out Energy Audit in a periodic manner – once every 3-4 years.

Energy Audit consists involves experts in this field and sectoral experts (as per plant requirements) and the exercise consists of various phases. The energy audit team consists of B.E.E. (Bureau of Energy Efficiency) Certified Energy Auditors, B.E.E. Certified Energy

Enerco Energy Solutions LLP



Phone : 022 42643671
Mobile : 09890737447

Email : solar@econserve.in
Website : www.econserve.in

Managers, Engineers (Electrical & Mechanical), measurement staff etc.

Broadly energy audit consists of the following 3 phases –

Phase 1 : Measurement / Visit Phase

During this phase the team visits the site and carries out all the measurements, discussions, basic analysis, data collection from the site. The phase could last for anywhere between 5 to 45 days depending on the plant size, type, scope etc.

Areas covered are –

- a. Electrical Transformer & Distribution
- b. Utilities - Pumps, Blowers, Fans, Compressors, Boilers, Cooling Tower, Chillers, Motors, Lighting etc.
- c. Process – Analysis for Sankey Diagram, Mass-energy balance etc.
- d. Fuel – DG Set, TPP etc.

Phase 2 : Draft Report Preparation Phase

Based on the data collected at site a detailed Energy Audit Report is prepared which consists of –

- a. Key Observations made
- b. Energy leakages in the plant
- c. Opportunities for Energy Saving
- d. Recommendations / Corrective actions
- e. Calculative analysis for monetary savings

Enerco Energy Solutions LLP



Phone : 022 42643671
Mobile : 09890737447

Email : solar@econserve.in
Website : www.econserve.in

- f. Details of each recommendation with payback
- g. List of vendors who proved the recommended equipment and / or solutions.
- h. Plan to implement each recommendation

Etc.

The report consists of all energy saving recommendations with a payback for ZERO (immediate) month to 24 months. This phase can last for anywhere between 3 to 7 weeks depending on the plant size and other factors.

Phase 3 : Report Finalization / Conclusion Phase

This includes incorporating the feedback received on Draft Report. The senior team visits again (if required) to conclude the audit and finalize the Energy Audit Report.

A systematically and well planned Energy Audit can result in significant energy saving in a plant. Typically a plant can expect savings in multiple times the cost of the audit. Therefor an energy audit pays back for itself in the form of free-to-implement energy saving recommendations and cost-effective energy saving recommendations with a quick RoI / payback. Typically a plant can look at a minimum of 2%-3% saving on it's SEC (Specific Energy Consumption).

Enerco Energy Solutions LLP



Phone : 022 42643671
Mobile : 09890737447

Email : solar@econserve.in
Website : www.econserve.in

II. Top 3 energy saving areas

We have a decade strong (10 years) of experience in Energy Audit with a variety of plants such as Steel, Cement, Thermal Power Plants, Chemicals, FMCG, Processing units, Textile etc. to name a few.

While each plant is unique and has it's own opportunities and challenges there are some common areas wherein a plant could benefit from implementing most common energy saving measures. We observed that majority of the plants (nearly 80%) can save good amount of energy by focusing on below areas. Of course these are only general guidelines and exact savings, investments, payback would be plant specific and is understood better during energy audit.

1. Compressed Air System

Observations :

- a. Manual loading and unloading
- b. Idle running
- c. Obsolete starting methods
- d. Manual intervention
- e. Leakages in Compressed Air System
- f. Maintenance

Recommendations :

- a. Automation for synchronization
- b. Adoption of advanced starting methods

Enerco Energy Solutions LLP



Phone : 022 42643671
Mobile : 09890737447

Email : solar@econserve.in
Website : www.econserve.in

- c. Arresting leakages in compressed air system

2. Pumps

Observations :

- a. Efficiency deviation from design
- b. Damages to pump internals – impeller or casing
- c. Malfunctioning valves
- d. Ageing
- e. Maintenance

Recommendations :

- a. Impeller re-sizing
- b. Higher maintenance focus
- c. Replacement of ageing pumps (can payback within months)

3. Fans & Blowers

Observations :

- a. Impeller sizing issues
- b. Obsolete control mechanisms
- c. Maintenance
- d. Throttled Dampers
- e. Efficiency deviation from design

Enerco Energy Solutions LLP



Phone : 022 42643671
Mobile : 09890737447

Email : solar@econserve.in
Website : www.econserve.in

Recommendations :

- a. Automation for fan speed adjustment.
- b. Repair of internal damages.
- c. Higher focus on maintenance.
- d. Better damper control.

It is observed that above 3 areas contribute to nearly 10% to 20% of total energy saving opportunity in a typical plant. In majority of the cases minor tweaks in operational practices can lead to huge savings i.e. ***zero investment recommendation with immediate payback.***

Some of the cases include incorporation of newer technologies which help in better control of energy usage. In a few of the observed cases it was recommended to adopt newer technologies for improved energy performance. Any cost implications of new technologies was suitably supported with quick RoI / payback of 9-12 months. In all cases the recommendations had a payback of lesser than 24 months as is accepted by majority of the Companies.

There are other common areas within every plant which could be explored for further energy saving which are as below.

Other common areas for Energy Saving –

- A. Using Rooftop Solar for captive use (significant savings)
 - Variety of financial models including ZERO upfront payment under BOOT / RESCO
 - Power cheaper than Electricity Board / DISCOM / Utility

Enerco Energy Solutions LLP



Phone : 022 42643671
Mobile : 09890737447

Email : solar@econserve.in
Website : www.econserve.in

- Can result in 10% to 30% saving on Electricity Bill per month
- Simple payback of 3-5 years for self-financed project which is attractive considering 20+ years of PV Solar life.

B. Replacing lighting with higher efficiency lights (miniscule savings)

- Newer and evolving technologies such as LED, Sky lamp etc.
- Can result in 1% to 2% saving on Electricity Bill per month.
- Simple payback is less than 1 year for majority of the replacements.

Enerco Energy Solutions LLP



Phone : 022 42643671
Mobile : 09890737447

Email : solar@econserve.in
Website : www.econserve.in

III. Conclusion

Energy Audit is a highly customized exercise carried out for plants and can result in SEC (Specific Energy Consumption) reduction of anywhere between 2% to 7%. The actual saving depends on a variety of factors but overall it is almost always possible to identify areas for energy saving.

The savings can have a huge impact on a plant's revenue and profitability based on the actual cost composition in overall plant manufacturing. With ever-rising grid tariffs, cost of basic energy (coal, oil, gas etc.) it definitely makes a strong business case for a plant to carry out Energy Audit. For plants which have never carried out energy audit there could be shocking revelations on this front. For plants which periodically carry out energy audit, this exercise helps in identifying niche areas for energy saving as well as keeping up the momentum.

While major energy saving lies in the process specific to a particular unit, the utilities present a generic energy saving opportunity for a plant. These energy saving opportunities are basically "low-hanging" fruits that can be used to capitalize on energy optimization by any plant – irrespective of its process or age or composition. By adopting few simple methods as outlined in the observations in the previous section, a plant can certainly expect to save some amount of energy., which is a welcome positive step. With additional measures the energy saving initiative could be taken up further.

Moreover a detailed energy audit reveals far more opportunities which can have a significant impact on a Company's profit margins. Many companies are waking up to this fact and are adopting energy saving measures as a Company wide policy and not just as a one-time exercise. ISO 50001 is another step in that direction which indicates how well a Company is using its energy resources. Customers are satisfied in more than 90% of the cases wherein

Enerco Energy Solutions LLP



Phone : 022 42643671
Mobile : 09890737447

Email : solar@econserve.in
Website : www.econserve.in

Energy Audit was carried out for the 1st time. Majority of these customers have vowed to carry out frequent and periodic energy audit to ensure maximum benefits and for maintaining continual momentum for energy saving within the plant.

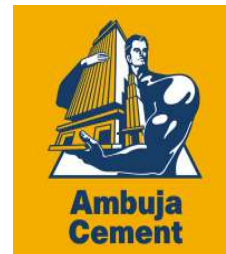
(Enerco Energy Solutions LLP cannot be held liable for the outcome of the recommendations mentioned herein)

About Us –

ENERCO ENERGY SOLUTIONS LLP (estd. 2009) is one of the oldest Energy Consultancy Companies with highly experienced team of Solar Consultants, Energy Auditors and Energy Managers led by IIT-B alumnus. We have had the pleasure and privilege to work with some of the top names across India and overseas and assisted them in adopting energy efficiency and Solar Power for their Company.

In case you are interested in carrying our Energy Audit of your plant., simply send us a mail on info@econserve.in / info@enercoenergy.in and we would be glad to assist you. You can even whatsapp or call on +91 9890737447.

Some of our Clients –



And Many Many More....