



Shri Shamrao Patil (Yadavkar) Educational & Charitable Trust's
**Sharad Institute of Technology College of Engineering,
Yadrav**

An Autonomous Institute

.NBA Accredited Programmes . NAAC 'A' Grade Institution .

An ISO 9001: 2015 Certified Institute

Dear Stakeholders,

Greetings from Energy Audit Team of SITCOE! Wish you happy prosperous and conservative New Year.

It is our great pleasure to inform you that our institute has been empanelled as 'Energy Auditing Firm' with Maharashtra Energy Development Agency Pune & Sugar Commissionerate Maharashtra Pune. We are in the field of Energy Management, Audit and perform energy audits for wide range of industries such as Textile, Sugar, Food & Snacks, Commercial Buildings etc. Substantial amount of reduction in energy costs has been achieved. Besides the benefit to industry, these activities help in Environment Protection and Sustainability.

Introduction

Energy such as electricity, oil, coal and natural gas is being consumed in all facilities for its operations. If energy is not efficiently used and managed. It will increase operational and maintenance costs besides polluting the environment. To identify and quantify areas of energy, wastage within an organization, conduct of energy audit by certified energy auditor at periodic intervals is highly recommended.

An energy audit is an investigation of all facets of a facilities, historical and current energy use with an objective of identifying and quantifying areas of energy wastage in its activities. The outcome is the identification of variable and cost effective energy saving measures to reduce energy consumption per unit of product output thereby lowering the operational costs.

Energy audit serves as the 'foundation' on which successful energy management program can be built in an organization. Energy audit also provides a 'benchmark' for managing energy and planning a more effective use of energy throughout the facility.

About Us

- Dr. Sanjay A. Khot (Accredited Energy Auditor AEA-0312)
- Empanelled with MEDA as Energy Audit Firm under save energy program
- Empanelled with sugar commissionerate Maharashtra Pune as Energy Auditing Firm
- Dedicated to Energy Conservation for over 10 Years
- Experience in diverse fields- Sugar factory, Textile Industry, University, College and government buildings etc.
- Ensure high quality of work with well-designed formats for data collection and analysis. Also, at the end of each study, a presentation is made to the management of the organization to discuss and convince them about calculation of savings and pay-back period
- Organize value addition program in energy conservation and audit, Renewable Energy
- All major instrument sfor conducting studies with accuracy and professionalism
Empanneled as Energy Auditing Firm with MEDA Pune & Sugar Commissionerate Maharashtra Pune

Energy Audit

Sr. No.	Name	Qualification
1	Dr. S. A. Khot	M. E. Ph.D. AEA (AEA-0312)
2	Dr. M. M. Khade	M.E. Ph.D.
3	Mr. U. S. Patil	M.Tech.
4	Mr. S. V. Kumbhar	M.E.
5	Mr. C. S. Patil	M.E.
6	Mr. C. D. Patil	M.E.
7	Mr. A. D. Sawant	ITI

Please feel free to contact for

- Energy Audit
- Certified Course of an Energy Conservation and Audit
- Certified course of Solar PV rooftop grid connected system
- Certified course of Energy Conservation Building Code (ECBC)
- Customize courses on Energy Conservation and Renewable Energy

Dr. S. A. Khot: Accredited Energy Auditor

Mobile No: 7350542020 **Email ID:** sakhot.2000@gmail.com

Energy Audit Instruments:

			
Flue Gas Analyzer	Anemometer	Ultrasonic Flow Meter	Thermal Imager
			
Power Analyser	Refrigeration Kit	Compressed air flow measurement	Data Logger

List of Completed Projects

Sr. No.	Name of the firm
1	Jawahar Navoday Vidyalay, Kagal
2	Dr. Babasaheb Ambedkar Technological University, Lonere
3	Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli
4	Walchand College of Engineering, Sangli
5	Krantiagrani J.D. Bapu Lad Jr. College Kundal
6	SIT Polytechnic
7	Vasantdada Patil Praishthan's College of Engineering and Visual Arts, Sion Mumbai
8	Sanjay Ghodawat University, Kolhapur
9	Government Polytechnic, Malvan
10	Sawalwadi Grampanchayat
11	Kavthepiran Gram Panchayat
12	Vita Municipal Water Treatment Plant
13	Annasaheb Dange College of Engineering and Technology Ashta
14	Annasaheb Dange College of Pharmacy Ashta
15	Sharad Sahkari Sakhar Karkhana Pvt. Ltd. Narande
16	Mohanrao Sahkari SakharKarkhana Ltd. Arag
17	Shree Bhogawati Sahakari Sakhar Karkhana Ltd., Parite
18	Kolhapur Zilla Shetkari Vinakari Sahakari soot girni Ltd. Yadrav
19	Ghodawat Foods International Private Limited
20	Sampada Paper Industries Pvt. Ltd.
21	Miraj Mahavidyalaya, Miraj
22	LaxmiSulphates
23	Ajara Nagar Panchyat
24	Gadhinglaj Nagarparishad
25	Chandgad Nagarpanchayat
26	Hupari Nagar Parishad
27	Ichalkaranji Nagarpalika
28	Jaysingpur Nagarparishad
29	Kagal Nagarparishad
30	KurundwadNagarparishad
31	Malakapur Nagarparishad
32	Murgud Nagarparishad
33	Panhala Nagarparishad
34	Shirol Nagarparishad
35	Vadgaon Nagarparishad
36	Hatkanangle Nagarparishad
37	Ashta Nagarpalika, Ashta

38	Jat Nagarparishad, Jat
39	Palus Nagarparishad, Palus
40	Shirala Nagarpanchayat, Shirala
41	Vita Nagarpalika, Vita
42	Digambar Jain Boarding
43	Global Texfin Ltd Ichalkaranji
44	Vandana Sizlers, Ichalkaranji
45	Vima lSizlers, Ichalkaranji
46	Radhamohan Processors, Ichalkaranji
47	Ichalkaranji Textiles Private Limited

Scope of Energy Audit

Typically the scope of an energy audit includes an examination of the following areas:

- Energy conservation in equipment such as boilers, furnaces, transformers, pumps, fans, compressors etc.
- Energy distribution (electricity, steam, condensate, compressed air, water etc.)
- Energy utilization efficiency of equipment
- Production planning, operation, maintenance and housekeeping
- Management aspects (information flow, data collection and analysis, feedback, achievements, training of employees, motivation etc.)
- Other related areas such as water audit & conservation, waste minimization studies are sometimes included as part of an energy audit.

The type of energy audit depends on factors such as function, size, type of facility and depth of the study. Energy audit is classified broadly into two types: preliminary energy audit and detailed energy audit.

Key Objectives of Energy Audit

- To analyse the energy consumption and wastage
- To develop different ways and means to utilize the available energy in the most efficient manner by the use of energy efficient devices
- To identify and analyse alternatives such as improved operational techniques and/or new equipment that could substantially reduce energy costs
- To perform an economic analysis on those alternatives and determine which are cost-effective for the business or industry involved. Adopt suitable operational strategies and time scheduling.

Types of Energy Audit

Preliminary Energy Audit	Detailed Energy Audit
<ul style="list-style-type: none"> • Short time frame (few days to one week) 	<ul style="list-style-type: none"> • Longer time frame (15-30 days)
<ul style="list-style-type: none"> • Uses readily available data for quick analysis and results are general 	<ul style="list-style-type: none"> • Uses operating data, detailed observations, measurements, energy and mass balance to assess energy performance
<ul style="list-style-type: none"> • Focus on common opportunities for energy efficiency 	<ul style="list-style-type: none"> • More specific recommendation for energy improvements covering all areas
<ul style="list-style-type: none"> • Economic analysis is mostly limited to calculation of simple payback period 	<ul style="list-style-type: none"> • Economic analysis may include internal rate of return, net present value, life cycle cost as well as simple payback period
<ul style="list-style-type: none"> • Broad recommendations 	<ul style="list-style-type: none"> • Detailed energy audit accounts for evaluates all major energy using equipment and systems and provides specific recommendations with comprehensive implementation plan.

Detailed Energy Audit Methodology

The detailed audit is typically carried out in following stages.

- a) Initiating the audit
- b) Preparing the audit
- c) Executing the audit
- d) Reporting the audit
- e) Implementing the audit

A step-by-step guidance for conduct of energy audit at site is presented in the following table. Energy Auditors follow these steps and amend as per their needs and facility being audited.

Step	Plan of Action	Results
A) Initiating the Audit		
Step 1	<ul style="list-style-type: none"> Understand client needs and expectation Gather main data prior to site visit Define audit criteria and scope of audit 	<ul style="list-style-type: none"> Overall operational strategy, major equipment/process and key technologies Historical and current data such as annual production , energy consumption, water consumption, performance indicators i.e. typical figure normally referred or quoted Decision on type of audit i.e. preliminary or detailed
B) Preparing the audit		
Step 2	<ul style="list-style-type: none"> Plan resources for audit Prepare audit checklist 	<ul style="list-style-type: none"> Resources (Total time for the audit including timeline for each step) Audit team and composition, responsibility of team member Energy audit instruments needs
Step 3	<ul style="list-style-type: none"> Conduct opening meeting Establish common understanding of audit process (auditors and client) 	<ul style="list-style-type: none"> Safety briefing Company philosophy towards investment for energy saving Facility layout or plan
C) Executing the audit		
Step 4	<ul style="list-style-type: none"> Walk-through audit Interview key facility personnel Gather onsite data 	<ul style="list-style-type: none"> Plant/process activities, current operating practices, metering, monitoring and energy reporting system Broad process flow diagram Energy utility diagram
Step 5	<ul style="list-style-type: none"> Gather additional information through tailor-made questionnaires for each department Evaluate collected information and identify focus areas for detailed investigation 	<ul style="list-style-type: none"> Energy tariffs and bills Month wise current and historical energy and related production data (1-3 years) Proportionate share of different energy sources when compared with total energy consumption for current year in a pie chart Production performance and related energy consumption under varying conditions: days, months, seasons Design data, operating data and schedule of operation of various equipment Breakdown of energy consumption by department/section as a pie chart Baseline energy consumption
Step 6	<ul style="list-style-type: none"> Conduct onsite measurements and performance survey using portable instruments and panel mounted instruments (if available) Conduct detailed performance trials 	<ul style="list-style-type: none"> Comparison of operating/measurements data with design (motor survey, fluid flow rates, temperatures) Analysis of various and trends (24 hours) of kVA, PF, kWh etc.

	for major energy equipment/system	<ul style="list-style-type: none"> • Load variations and trends in pumps, fan, chillers refrigerators, cooling towers, compressors etc.
Step 7	<ul style="list-style-type: none"> • Analyse use of energy material and water use 	<ul style="list-style-type: none"> • Energy and material balance and assessment of energy losses/wastes • Water conservations opportunities
Step 8	<ul style="list-style-type: none"> • Identify , develop and refine ENCON opportunities using brainstorming vendor inputs etc. 	<ul style="list-style-type: none"> • List of ENCON measures • Technology options and budgetary offers from vendors
Step 9	<ul style="list-style-type: none"> • Evaluate ENON opportunities (cost-benefits analysis) 	<ul style="list-style-type: none"> • Technical and financial feasibility of various ENCON measures • Selected ENCON measures for implementation as short, medium and long term measures (some short term measures may be implemented immediately at site and impact on energy savings can be demonstrated to the client)
D) Reporting the audit		
Step 10	<ul style="list-style-type: none"> • Prepare a draft or working report for presentation to facility management • Conduct closing meeting after submission of final report (soft copy) 	<ul style="list-style-type: none"> • Highlights of the audit with key findigs and ENCON measures • Concurrence of draft report from all concered or functional managers and modifications as required • Submission of fine-tuned report (if required) as soft and hard copy • Presentation to the facility management as the final appraisal
E) Implementing the audit		
Step 11	<ul style="list-style-type: none"> • Prepare action plan for implementation and follow-up 	<ul style="list-style-type: none"> • Action plan for implementation of ENCON options (DPR for major project) by facility management or through ESCO • Monitoring and review by ESCO or facility management assisted by energy auditor • Measurement and verification

“India’s oil and gas reserves are estimated to last just 17.5 years and 4.2 years respectively at the current R/P ratio. Coal is likely to last for 100 years.”