



PENTASHIVA INFRAVENTURES PVT. LTD.

An ISO 9001: 2015 Company



In Association With

Ensave Consultancy and Training Pvt. Ltd.

Presenting

“Energy Audit and Management Solution”

“Helping to Create Sustainable Business”

— About Us —

We PENTASHIVA INFRAVENTURES PRIVATE LIMITED believes in Energy Management, Environment Management and Green Productivity, We have experts who have experience in India and abroad. We are rendering our services with a team of experienced BEE (Bureau of Energy Efficiency, Govt. of India), accredited Energy Auditors, certified energy auditors, electrical and mechanical engineers. We work as per various industrial standards by using latest energy audit instruments.

We have developed expertise for improving energy efficiency in all type of Manufacturing, process, engineering and Commercial Buildings. PSIV provide consulting service, through detailed energy audit covering both electrical and thermal energy audit to reduce energy consumption and cost. We also conductin company training program, workshops/seminars and Energy awareness for all staff and employees. Our Energy audit and Management solutions helps in creating sustainable Business.



Energy cost reduction is the need of the hour, for each and every Industry to meet the increasing global competition. “Energy efficiency” is proven economic drivers that can help Industries to reduce their energy waste while reduce 'Greenhouse Gas' emissions. Energy cost on account of Electricity, Fuel oil, Coal, Gas, Water and Steam is an area where very effective & quick results can be achieved by energy auditing. Energy saving potential is up to 25% of total consumption of commercial energy use in industrial & commercial sector, even in very well managed organization

Our Vision

- ❖ To excel in providing cost effective & innovative solutions for enhancing energy efficiency and cost reduction.

Our Mission

- ❖ To exceed the client's expectations & demands by providing our best technical resources.
- ❖ To create awareness of energy efficiency and energy conservation role in mitigating climate change.

Our Objective

Our energy audit experiences shows that there is considerable untapped energy saving potential up to 25% of total consumption of commercial energy use in industrial & commercial sector, even in very well managed organisation. Realizations of energy saving will depend upon identification and the successful implementation of various energy saving projects. Our services results in saving of electricity and fossil fuel which in turn provides monetary saving and reduce pollution.

Our Services

- ❖ Detailed Energy Audit
- ❖ Electrical Energy Audit
- ❖ Thermal Energy Audit
- ❖ Building Energy Audit
- ❖ Water Audit
- ❖ ISO 50001 Implementation
- ❖ Carbon Foot Print Study
- ❖ Harmonics Study
- ❖ Electrical Study
- ❖ Green Productivity



Energy Audit and Energy Efficiency

Rapidly increasing energy prices, pressures to decrease the emissions of greenhouse gases and need for the industry to move towards sustainable development, demand significant improvements in energy and efficiency. More than 50% of the energy produced in the India is being wasted from production and distribution to consumption. Our goal is to maximize the energy efficiency in industrial sector and commercial buildings.



We are engaged in providing Detailed Energy Audits and Water Audits for many Industries and commercial buildings enabling them to save energy and cost reduction. We are rendering our services with a team of experienced BEE (Bureau of Energy Efficiency, Govt. of India), **Accredited Energy Auditors, Certified Energy Auditors**, electrical and mechanical engineer.

We offer Energy Management solutions to all manufacturing industries and commercial buildings.

We work as per various industrial standards by using **latest energy audit instruments**

Detailed Energy Audit

Energy Audit is defined as “the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption”.

We carry out energy audit to establish and quantify the cost of the various energy inputs and consumption flows within an organization over a given period.

The primary objectives of energy audit are to identify and evaluate opportunities to reduce energy consumption per unit of product output and reduce operating costs through energy conservation and planning. Energy audit provides a “bench-mark” for managing energy in the organization and also provides the basis for planning a more effective use of energy throughout the organization. We carryout Preliminary Audit, Detailed Audit, Investment-Grade Energy Audit, Baseline Energy Audit.

Detailed energy audit includes a complete description of the facility, including an equipment inventory, an energy balance, detailed energy savings and costs associated with each low-cost and not-cost measure, financial analysis of each recommended measure, identification and rough estimates of capital project costs and savings. Energy savings and economic feasibility are determined as accurately as possible.

The portable instruments, trend logs and data loggers are used in detailed energy audits for assessing the current performance accurately. The scope of an energy audit includes an examination of the following areas:

- ◆ Energy generation/conversions equipments like Boilers, Furnaces, Heaters, Pumps, Fans, Compressors, Transformers etc.
- ◆ Energy distribution network of Electricity, Water, Steam, Condensate, Compressed Air etc.
- ◆ Energy utilisation efficiency of all equipment and buildings.
- ◆ Efficient Planning, Operation, Maintenance and Housekeeping
- ◆ Management aspects of Design and Operating Data collection, Field Measurements, Data Analysis, and Training

We conduct detailed audit in three phase's namely pre-audit, detailed audit and post audit as per BEE's 10 step methodology for effective results

The Results

- ◆ Immediate savings through No-cost recommendations
- ◆ Expected reduction in utility costs from 10-30%
- ◆ Long-term roadmap for ongoing utility savings
- ◆ Compliance with benchmarking and regulatory/mandatory laws

Preliminary Visit

We undertake preliminary visit to your organisation for assessment and understanding your requirement with respect to audit and training. On hearing from you, our consultant will visit your plant for the detail discussion.

Electrical Energy Audit

Electrical energy is the most extensively utilized form of energy due to its ease of usage. This high grade energy is utilised in various applications like melting, heating furnaces, mechanical drives such as pumps, fans and compressors, lighting etc. Electrical energy audit is carried out in two distinct parts of electrical system. The first part is to study in electrical supply and distribution system covering Transformers, Billing & Tariff Analyses, Substation, PF Improvement, MD Reduction, Cable Optimisation, Motor Load Survey, DG set etc. The second part is to study all the end use like Pumps, Blowers, Air Compressors, HVAC System, and Heating and Illumination System.



We conduct electrical energy audit to establish electrical energy balance and to study for effective utilization of tariff structure and all electrical energy equipment's. Based on the energy losses & percentage loading of rotating equipment, energy conservation measures are presented with techno economic analysis. Energy substation and alternate energy application will be explored for sustainability.

Areas covered in Electrical Energy audit

- ◆ Electrical Distribution Networks, Transformers, HT/LT Panels, Earthing
- ◆ Distribution Boards, Cables, UPS, Capacitor banks, DG sets.

- ◆ Electric motors and Drives
- ◆ Pumps, fans and blowers
- ◆ Air Compressors and Compressed Air System
- ◆ Illumination System,
- ◆ Heating Ventilation & Air Conditioning (HVAC)
- ◆ Refrigeration System, AHU, VAM and Cooling Tower
- ◆ Energy Monitoring and Maintenance Practice.

Thermal Energy Audit

Thermal energy is generally obtained from firing of a fossil fuel. Thermal energy audit analyses the generation distribution and utilization of steam, thermic fluid, hot air system and highlights the gaps in energy performance. Audit report provides firm actions to eliminate or minimize energy use for a given application or improve energy efficiency.

Steam Boiler, Furnaces, Thermic Fluid Heater and Hot Air Generator are Fired Equipment. The performance criteria of this equipment are measurable through its efficiency. Possibility of fuel substitution for cost reduction is studied in detailed. Heat losses through improper insulation and energy loss due to pressure drops are analysed and suggests remedial action for improvement. Analysis of Utilization of thermal energy will be carried out for suggests WHR equipment's like Heat Wheels, Heat Pipes, Heat Pumps, Thermo-compressor, Economiser etc. The performance of Fuels and Combustion System, Boiler, Furnaces, Insulation, Heat Exchangers and Waste Heat Recovery System will be studied in details. In addition, energy substation and alternate energy application will be explored for sustainability.

Areas covered in Thermal Energy audit

- ◆ Steam Generation Boilers and Thermic Fluid Heater
- ◆ Co-Generation Turbine and their Auxiliaries
- ◆ Heat and Mass Balances of Process Plants
- ◆ Hot Water System and Hot Air Generator
- ◆ Fuel Fired Furnaces, Burners
- ◆ Electric Ovens, Heaters
- ◆ Steam Distribution System and Steam Traps
- ◆ Refractory and Thermal Insulation
- ◆ Waste Heat Recovery
- ◆ Heat Exchangers

Building Energy Audit

Building energy audit is an inspection, survey and analysis of energy flows in a building conducted to identify opportunities to reduce energy consumption and greenhouse gas emissions while maintaining or improving human comfort and safety in a building. Energy audit consists of a comprehensive assessment of your



electricity, water, gas and all utility equipments and building conditions that may cause excessive energy consumption. Energy using systems are building envelope, lighting, heating ventilation and air conditioning, hot water, mechanical systems and plug & process load.

Audit begins with step-by-step analysis of the building's energy use factors and costs, such as insulation values, occupancy schedules, chiller efficiencies, lighting levels, and records of utility and fuel expenditures. It includes the identification of energy efficiency measures along with the cost-effective benefits. The second stage is to improve efficiency of energy conversion equipment and to reduce energy use by proper operations and maintenance. The purpose of energy audit is to provide information on Energy Efficiency measures that is detailed enough to allow business owners and managers to make implementation decisions based on their current and future business goals. We provide building energy audit services with BEE guidelines and ECBC code.

Water Audit

The increasing gap between water availability and demand highlights the need for conservation of water. Water audit is an effective management tool for minimizing losses, optimizing various uses and thus enabling considerable conservation of water.



We conduct Water Audit to establish water balance by tracing water use from its point of entry into the facility through its discharge into the sewer. We identify each point of water use within and around the facility and estimate the quantity of water used at each of these points like and process water use, maintenance, mechanical systems, sanitation, landscaping, building processes etc. For each of those areas the water use audit will provide a breakdown of the how, when and where of water use. Elements of water audit include a record of the amount of water produced (total water supply), water delivered to metered users, water delivered to unmetered users, water loss and suggested measures to address water loss (leakages and other unaccounted losses).

We identify and quantify unaccountable water losses and possible leaks and provide a road map of potential savings. Water audits should also take into consideration water quality.

Largest potential savings can be achieved is through the recycling of water or the use of rain water. Water audits can help identify potential uses for alternative sources of water.

ISO 50001 Implementation

We help organisations to implement functional energy management systems and can assist in the following areas.

- ◆ Preparation of organisation's energy policy
- ◆ Preparation and review of energy aspects and opportunities
- ◆ Planning energy management system
- ◆ Implementing the energy management system
- ◆ Preparation of energy objectives and smart target setting
- ◆ Analysing energy performance, setting baselines and selecting EnPIs
- ◆ Training employees based on organisation's specific needs
- ◆ Pre-assessment audit to make sure to meet certification standards
- ◆ Ongoing assistance to ensure compliance and continual improvement
- ◆ ISO 50001 - Preparation for certification, internal auditing and ongoing management support

Carbon Footprint Services

The growing need for improved energy efficiency and carbon emission reduction continues to increase, as companies maintain their need to reduce operational costs and take part in protecting the environment. A carbon footprint measures the total greenhouse gas emissions caused directly and indirectly by a person, organisation, event or product. A carbon footprint is measured in tonnes of carbon dioxide equivalent (tCO₂e). A carbon footprint considers all six of the Kyoto Protocol greenhouse gases: Carbon dioxide (CO₂), Methane (CH₄), Nitrous Oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and Sulphur Hexafluoride (SF₆)

We provides access to environmental impact assessment experts who can demystify the carbon footprint, calculate the level of GHG emissions and address questions regarding your specific carbon footprint to help you meet legislated GHG reduction targets. Carbon reporting is an integral part of any sustainability program. We identify emissions reduction opportunities and assists companies to establish realistic GHG emissions targets. The essential elements to a successful carbon management program include conducting comprehensive evaluations, understanding your carbon goals, vigorously pursuing the best solutions and measuring your results

Harmonics Study

We conduct power quality study in using portable power and harmonics instruments. This study can be a part of electrical energy audit or may be conducted separately. The study includes Power quality, harmonics analysis, voltage and current unbalances study, power

factor etc. The detailed report contains measured values, detailed analysis and remedial solutions and recommendations to improve power quality of a facility.

Sectors Covered

- ❖ Aluminium
- ❖ Thermal Power Plant
- ❖ Steel
- ❖ Foundry
- ❖ Cement
- ❖ Paper
- ❖ Refinery
- ❖ Fertilizer
- ❖ Railways
- ❖ Textile
- ❖ Chemical
- ❖ Engineering
- ❖ Mining
- ❖ Dairy
- ❖ Sugar
- ❖ Food & Beverages
- ❖ Rubber & Plastics
- ❖ It Sector
- ❖ Hospital
- ❖ Hotel
- ❖ Institution
- ❖ Municipality
- ❖ Banks
- ❖ Msmes



— Our Training Services —

In the ever changing energy industry, knowledge management is the key to efficient, reliable and profitable operations. Keeping up-to-date with the latest developments is a huge challenge with new technologies and regulations constantly emerging. Apart from workshops we conduct customised in-house training to your company's specific needs. These can be tailored versions of existing courses, or completely new.

We conduct the following type of training:

- ❖ Customized In-Company Training
- ❖ Energy Awareness for All Employees
- ❖ Open Enrolment Courses and Workshops

List of Training Programme Offered

Energy Management

- ◆ Industrial Energy Audit & Management
- ◆ Electrical Energy Audit & Conservation
- ◆ Electrical Safety Audit
- ◆ Energy Savings in Pumps Fans and Air Compressors
- ◆ Energy Conservation in HVAC System
- ◆ Energy Conservation in Cooling Towers
- ◆ Energy Conservation in DG Sets
- ◆ Energy Conservation in Boiler & Steam System
- ◆ FBC Boiler and Cogeneration
- ◆ Energy Conservation in Furnaces
- ◆ Boiler & Cooling Water Treatment
- ◆ Process Integration and Pinch Technology
- ◆ ISO 5001 Energy Management Systems
- ◆ Operation & Maintenance of Thermal Power Plant
- ◆ Waste Heat Recovery & Heat Exchangers
- ◆ Energy Conservation in Commercial Buildings

Environment Management

- ◆ Waste Minimization
- ◆ Efficient Operation of Effluent Treatment Plant

Green Productivity

- ◆ Lean Management and Productivity
- ◆ 5S and Kaizen
- ◆ Lean, Clean and Green Management
- ◆ LEED & Green Building Initiative

———— Training Methodology ————

Training methodology includes lectures, videos, animations, question & answer sessions, quiz and interactive worked examples. Relevant case studies will be provided to illustrate the application of each tool in an operations environment

Our Strengths

- ❖ Accredited Energy Auditor Professionals
- ❖ Advanced Energy Audit Instruments to carryout energy audit
- ❖ Our recommendation and solutions are Practical, Implementable and Cost Economics.
- ❖ Quick & Quality services
- ❖ In-company training to operators & supervisors level and mangers & executives level

———— Area of Services ————

Electrical Energy Systems: Transformer, Motors, Capacitors, Electrical network, Fans and Blowers, Pumping system, Compressed air system, HVAC, Cooling tower, Illumination, DG sets, Tariff structure, VFD, Harmonic ,Advanced controls and Electrical Safety. Energy efficient technology and performance evaluation of electrical system

Thermal Energy Systems: Fuels and Combustion, Industrial Boilers, Steam System, Furnaces (Fuel and Electric), Dryers, Insulation and Refractories, FBC Boilers, Cogeneration, Tri-generation, Gas & Steam Turbines, WHR and Heat Exchangers. Energy efficient technology and performance evaluation of Thermal system

Clean Energy Systems: Renewable Energy, Solar, Wind, Bio-Energy, Waste Minimization, Clean Technology

Energy Management: ISO 50001, CMVP, ECBC, PAT, M&V, LEED & Green Building Initiative. BEE guide books syllabus for Energy Managers/Energy Auditors Exam.

“Save energy and water for sustainable life”

————— Contact Us —————

Get in Touch with us

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