

Course No. 1573

Energy Auditing & Energy Performance Assessment Training Course

ENERGY MANAGEMENT & SUSTAINABILITY
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Energy Auditing & Energy Performance Assessment Training Course provides an advanced and practical framework for planning, conducting, analyzing, and reporting energy audits across industrial, commercial, public-sector, and utility facilities. The course focuses on identifying energy consumption patterns, significant energy users, operational inefficiencies, and energy losses, while developing the analytical capabilities required to evaluate performance against baselines, targets, benchmarks, and operational requirements.

Energy auditing is a critical tool for understanding how energy is consumed and where improvement opportunities exist. However, an effective audit requires more than reviewing utility bills or measuring equipment consumption. It requires reliable data, appropriate measurement methods, clear system boundaries, an understanding of production and operating conditions, and a structured assessment of thermal, electrical, mechanical, and utility systems. The course provides a systematic methodology that connects energy data with actual operational performance.

The program covers energy audit planning, data collection, energy measurement, energy and heat balances, electricity and fuel analysis, steam and thermal energy assessment, and detailed evaluation of major energy-consuming equipment. Participants will examine boilers, furnaces, process heaters, motors, transformers, pumps, compressors, heat exchangers, cooling systems, lighting, compressed air systems, steam networks, and other significant energy users.

The course also emphasizes energy performance assessment through energy baselines, energy performance indicators, benchmarking, variance analysis, and normalized performance evaluation. Participants will learn how to identify energy efficiency opportunities, estimate potential savings, evaluate technical and economic feasibility, prioritize improvement initiatives, and prepare professional energy audit reports that support investment and operational decisions.

Through practical case studies, energy data analysis, energy balance exercises, equipment performance assessments, audit reporting workshops, and measurement and verification activities, the Energy Auditing & Energy Performance Assessment Training Course develops practical capabilities for implementing effective energy management programs. The course is suitable for government entities, ministries, oil and gas organizations, power and utility companies, manufacturing facilities, petrochemical plants, commercial buildings, and large corporations.

Objectives

- Analyze the principles and strategic role of energy auditing in improving energy efficiency and operational performance during the course.
- Develop structured energy audit plans covering scope, objectives, boundaries, data requirements, measurement needs, and reporting processes.
- Evaluate the quality, completeness, reliability, and suitability of energy and operational data for audit purposes.
- Apply energy and heat balance techniques to identify energy inputs, useful outputs, and significant losses.
- Assess the performance and efficiency of major thermal, electrical, mechanical, and utility systems.
- Analyze electricity, fuel, steam, thermal energy, and other energy consumption patterns to identify inefficiencies.
- Design appropriate energy baselines and energy performance indicators for different facilities and operating conditions.
- Identify and prioritize energy efficiency opportunities according to savings potential, cost, risk, and implementation feasibility.
- Evaluate the technical and economic viability of energy efficiency improvement projects.
- Develop professional energy audit reports containing findings, root causes, recommendations, priorities, and implementation actions.
- Apply measurement and verification principles to assess the actual results of implemented energy efficiency initiatives.
- Align energy auditing and performance assessment practices with energy management, sustainability, cost reduction, and continuous improvement objectives.

Who Should Attend

This course is designed for professionals working in energy management, energy efficiency, engineering, operations, maintenance, facilities, utilities, sustainability, and industrial performance. It is particularly relevant to Energy Managers, Energy Engineers, Electrical Engineers, Mechanical Engineers, Process Engineers, Facilities Managers, Operations Managers, Maintenance Managers, Reliability Engineers, Energy Auditors, Energy Analysts, and professionals responsible for assessing and improving energy performance.

The program is also suitable for Engineering Directors, Plant Managers, Operations Directors, Maintenance Directors, Asset Managers, Sustainability Managers, Technical Managers, and senior decision makers responsible for energy consumption, operating costs, equipment performance, and energy efficiency investment programs. Professionals working in government entities, ministries, oil and gas organizations, power and utilities companies, manufacturing facilities, petrochemical plants, mining operations, commercial buildings, and large industrial organizations can benefit from the course.

The course is particularly valuable for professionals involved in energy audits, measurement and verification, energy data management, performance benchmarking, process optimization, equipment assessment, project evaluation, and management reporting. It also provides practical value for finance, procurement, project management, and sustainability professionals involved in assessing the financial and operational implications of energy efficiency initiatives.

Learning Outcomes

- Explain the principles, objectives, levels, and methodology of professional energy auditing.
- Define appropriate audit scope, system boundaries, data requirements, and measurement plans.
- Evaluate energy data quality and identify gaps, inconsistencies, and measurement issues.
- Develop energy and heat balances to identify energy inputs, outputs, and major losses.
- Analyze electricity, fuel, steam, and thermal energy consumption and identify abnormal patterns.
- Assess the efficiency and operating performance of major thermal, electrical, mechanical, and utility systems.
- Develop energy baselines and performance indicators appropriate to facility and operating conditions.
- Identify and quantify practical energy efficiency improvement opportunities.
- Evaluate the technical, financial, operational, and implementation aspects of energy efficiency projects.
- Prepare professional energy audit reports with clear findings, root causes, recommendations, and priorities.
- Apply measurement and verification techniques to assess energy savings achieved after implementation.
- Develop an integrated energy performance improvement plan based on audit findings and organizational priorities.

Course Outline

DAY 01

Energy Auditing Foundations and Audit Planning

- Principles, objectives, and role of energy auditing
- Types and levels of energy audits
- Audit scope, boundaries, objectives, and areas of focus
- Collection of historical, financial, operational, and energy data
- Identification of significant energy users and major consuming systems
- Review of utility bills, meters, operating records, and maintenance information
- Data quality assessment and identification of information gaps
- Planning measurements, field observations, and data collection activities

PRACTICAL APPLICATION

Develop an energy audit plan for a representative facility, including scope, objectives, boundaries, information requirements, measurement needs, and reporting structure

DAY 02

Energy Measurement, Energy Balances and Consumption Analysis

- Principles of energy measurement and metering
- Electricity, fuel, gas, steam, and thermal energy analysis
- Energy and heat balance development
- Identification of energy inputs, useful outputs, and losses
- Consumption profiles and time-based energy analysis
- Demand, load, production, and operating condition relationships
- Identification of abnormal and inefficient consumption patterns
- Data normalization based on production, load, weather, or operating conditions

DAY 02 — CONTINUED

PRACTICAL APPLICATION

Prepare an energy balance and analyze facility consumption data to identify major losses and inefficient energy uses

DAY 03

Equipment and System Performance Assessment

- Boiler, furnace, and process heater energy efficiency assessment
- Electrical system and transformer performance evaluation
- Motor efficiency and loading assessment
- Pump and compressed air system efficiency
- Compressor performance and energy consumption
- Heat exchanger and steam system assessment
- Cooling, ventilation, and lighting system performance
- Thermal insulation and heat-loss assessment
- Waste heat recovery opportunities

PRACTICAL APPLICATION

Conduct a detailed energy performance assessment of selected equipment and systems and identify specific efficiency improvement opportunities

DAY 04

Energy Efficiency Opportunities and Economic Evaluation

- Identification of energy efficiency measures from audit findings
- Classification and prioritization of improvement opportunities
- Estimating energy savings and operating cost reductions
- Capital investment and operating cost considerations
- Technical feasibility and operational constraints
- Economic evaluation of energy efficiency projects
- Payback considerations and investment prioritization

DAY 04 — CONTINUED

- Risk, reliability, maintenance, and implementation considerations
- Development of corrective actions and project implementation plans

PRACTICAL APPLICATION

Develop an energy efficiency project portfolio and rank opportunities according to savings potential, investment, risk, feasibility, and organizational value

DAY 05

Energy Audit Reporting, Performance Assessment and Continuous Improvement

- Energy baselines and energy performance indicators
- Benchmarking and comparison of actual performance
- Preparing technical and executive energy audit reports
- Presenting audit findings and recommendations to decision makers
- Measurement and verification of energy savings
- Monitoring implementation and post-project performance
- Integrating energy auditing with energy management systems
- Governance, accountability, and performance review
- Continuous improvement and identification of new energy opportunities

FINAL WORKSHOP

Prepare and present a comprehensive energy audit report covering audit scope, data collection, energy balances, equipment assessment, performance indicators, energy efficiency opportunities, economic evaluation, implementation priorities, measurement and verification, and continuous improvement actions



Register or Request More Information

Course page: <https://quest-training.com/courses/energy-auditing-energy-performance-assessment-training-course>

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