

Course No. 1574

Industrial Energy Management Training Course

ENERGY MANAGEMENT & SUSTAINABILITY
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Industrial Energy Management Training Course provides an advanced and practical framework for managing, measuring, optimizing, and continuously improving energy performance across industrial facilities. The course focuses on developing a structured approach to energy management that connects energy consumption with production, operating conditions, maintenance, asset performance, cost management, sustainability, and overall organizational objectives. Participants will learn how to transform energy data into actionable insights and practical improvement initiatives.

Industrial facilities operate complex and interconnected thermal, electrical, mechanical, and utility systems. Boilers, furnaces, process heaters, turbines, motors, pumps, compressors, cooling systems, steam networks, heat exchangers, compressed air systems, and electrical distribution infrastructure can all significantly influence energy consumption and operating costs. Effective industrial energy management therefore requires a systems-based understanding of how these assets interact and how operational decisions affect overall energy performance.

The program covers the key elements of an effective industrial energy management framework, including energy planning, energy policy and objectives, energy reviews, energy balances, significant energy users, energy baselines, energy performance indicators, monitoring and measurement, energy auditing, benchmarking, process optimization, equipment efficiency, utility management, and continuous improvement. Participants will examine practical methods for identifying energy losses, evaluating efficiency opportunities, and improving energy performance without compromising safety, production, quality, or reliability.

A strong emphasis is placed on integrating energy management with daily operational and maintenance practices. Participants will explore how energy performance can be improved through optimized operating conditions, preventive and predictive maintenance, process integration, waste heat recovery, improved control strategies, energy-efficient equipment, and effective management of utilities. The course also addresses the technical and economic evaluation of energy improvement projects and the development of management systems that support accountability and measurable results.

Through industrial case studies, energy assessment exercises, energy balance calculations, equipment performance reviews, energy monitoring activities, project evaluation workshops, and implementation planning, the Industrial Energy Management Training Course develops practical

capabilities that can be applied across oil and gas, petrochemical, manufacturing, power, utilities, mining, metals, cement, food processing, and other industrial environments. The program is suitable for government entities, ministries, public sector organizations, large corporations, engineers, energy managers, operations leaders, maintenance professionals, and senior decision makers.

Objectives

- Analyze the principles, objectives, and strategic importance of industrial energy management within the course context.
- Develop an integrated energy management framework covering energy planning, assessment, monitoring, improvement, and performance review.
- Evaluate industrial energy consumption patterns and identify significant energy users and major sources of loss.
- Apply energy and heat balance techniques to assess process and facility energy performance.
- Assess the efficiency of thermal, electrical, mechanical, and utility systems used in industrial facilities.
- Design practical energy efficiency measures covering process optimization, equipment performance, utilities, controls, and maintenance.
- Develop energy baselines and energy performance indicators suitable for industrial operations and production conditions.
- Apply energy monitoring, benchmarking, and variance analysis techniques to identify performance deterioration and improvement opportunities.
- Evaluate the technical and economic feasibility of energy efficiency and optimization projects.
- Strengthen the integration of energy management with operations, maintenance, asset management, engineering, finance, and sustainability.
- Develop governance, accountability, reporting, and continuous improvement mechanisms for industrial energy performance.
- Align industrial energy management initiatives with cost reduction, operational excellence, sustainability, resilience, and long-term organizational objectives.

Who Should Attend

This course is designed for professionals responsible for energy performance, industrial operations, engineering, maintenance, utilities, process optimization, and sustainability. It is particularly relevant to Energy Managers, Energy Engineers, Process Engineers, Mechanical Engineers, Electrical Engineers, Utilities Engineers, Plant Managers, Operations Managers, Maintenance Managers, Reliability Engineers, Energy Analysts, Facilities Managers, and professionals responsible for managing energy-intensive industrial assets and processes.

The program is also suitable for Engineering Directors, Operations Directors, Technical Managers, Asset Managers, Sustainability Managers, Maintenance Directors, Production Leaders, and senior decision makers responsible for energy costs, operational performance, asset efficiency, capital investments, and industrial sustainability. Professionals working in government entities, ministries, oil and gas companies, petrochemical facilities, manufacturing plants, power and utilities organizations, mining and metals operations, cement plants, food processing facilities, and large corporations can benefit from the frameworks covered in the course.

The course is particularly valuable for professionals involved in energy audits, energy planning, process improvement, utility management, equipment optimization, energy monitoring, maintenance strategy, capital projects, and energy efficiency programs. It also provides relevant knowledge for finance, procurement, project management, and sustainability professionals who support energy investment and performance improvement decisions.

Learning Outcomes

- Explain the principles and strategic role of industrial energy management in improving organizational performance.
- Develop an integrated energy management framework appropriate to industrial facilities and production environments.
- Identify significant energy users and analyze the operational and technical factors driving energy consumption.
- Prepare and interpret energy and heat balances for processes, equipment, and industrial facilities.
- Assess the performance of boilers, furnaces, heat exchangers, turbines, motors, pumps, compressors, cooling systems, and utility networks.

- Identify thermal, electrical, mechanical, and utility energy losses and recommend appropriate corrective measures.
- Develop energy baselines and energy performance indicators linked to production, operating conditions, and energy consumption.
- Analyze energy monitoring data, trends, benchmarks, and variances to identify deterioration and improvement opportunities.
- Evaluate energy efficiency projects using technical, financial, operational, and risk considerations.
- Integrate energy management with maintenance, asset management, process optimization, and operational decision making.
- Prepare professional energy performance reports and management dashboards for technical and executive audiences.
- Develop a practical industrial energy improvement roadmap aligned with cost management, sustainability, reliability, and long-term business goals.

Course Outline

DAY 01

Industrial Energy Management Foundations and Strategic Planning

- Principles and objectives of industrial energy management
- Relationship between energy performance, production, operating cost, and profitability
- Energy management policy, governance, responsibilities, and accountability
- Industrial energy planning and identification of strategic priorities
- Energy consumption profiles and significant energy users
- Energy reviews and identification of major energy performance drivers
- Energy data collection, measurement, and information quality
- Developing energy objectives, targets, and improvement priorities

PRACTICAL APPLICATION

Develop an industrial energy management framework and identify significant energy users, strategic objectives, and initial improvement priorities

DAY 02

Energy Assessment, Energy Balances and Process Performance

- Principles of industrial energy assessment
- Energy and heat balance development
- Analysis of fuel, electricity, steam, heat, and other energy flows
- Process energy consumption and production relationships
- Identification and analysis of energy losses
- Energy baselines and energy performance indicators
- Energy benchmarking and performance comparison
- Analysis of operating conditions and production-related variables

PRACTICAL APPLICATION

Prepare an energy and heat balance for a representative industrial facility and identify major losses, performance gaps, and energy improvement opportunities

DAY 03

Thermal, Electrical and Utility Energy Optimization

- Boiler, furnace, and process heater efficiency
- Steam generation, distribution, condensate recovery, and utilization
- Heat exchanger performance and heat-transfer efficiency
- Electric motor and transformer efficiency
- Pumping systems and flow optimization
- Compressor and compressed air system efficiency
- Cooling systems, fans, and auxiliary equipment
- Waste heat recovery and process heat integration
- Preventive and predictive maintenance for energy performance

PRACTICAL APPLICATION

Conduct an integrated equipment and utility performance assessment and develop priority energy optimization measures

DAY 04

Energy Monitoring, Auditing and Improvement Project Evaluation

- Energy monitoring systems and measurement strategies
- Developing energy performance indicators and monitoring thresholds
- Trend analysis and energy performance variance analysis
- Energy auditing methodologies and practical audit activities
- Identifying and quantifying energy efficiency opportunities
- Technical feasibility assessment of improvement initiatives
- Economic evaluation, investment requirements, savings potential, and payback considerations
- Risk, reliability, safety, and implementation considerations
- Measurement and verification of energy savings

PRACTICAL APPLICATION

Develop an energy efficiency project portfolio and evaluate the technical, financial, operational, and implementation priorities of selected initiatives

DAY 05

Energy Performance Management, Governance and Continuous Improvement

- Developing an integrated industrial energy management strategy
- Linking energy management with operations, maintenance, asset management, and engineering
- Establishing energy performance targets and management dashboards
- Executive and operational reporting of energy performance
- Governance, accountability, and ownership of energy results
- Integrating energy management into capital planning and business decisions
- Continuous improvement and energy performance review mechanisms
- Change management and development of an energy-conscious organizational culture
- Linking industrial energy management with sustainability, cost reduction, and operational resilience

DAY 05 — CONTINUED

FINAL WORKSHOP

Develop and present a comprehensive Industrial Energy Management strategy covering energy planning, significant energy users, energy balances, baselines, performance indicators, equipment optimization, monitoring, auditing, project evaluation, governance, reporting, and continuous improvement

Register or Request More Information

Course page: <https://quest-training.com/courses/industrial-energy-management-training-course>

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