Energy Management and Energy Efficiency: Audits, EnPIs and Verified Savings

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Paris - Right Bank business hotel



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Introduction:

Energy management and energy efficiency often stall because organisations buy equipment upgrades without a baseline, cannot show verified savings and fail to win budget for the next project. Utility bills keep rising while metering data sits unused. This Core Concept course equips practitioners to run a structured energy programme: set policy and roles, carry out an energy review and audit, size savings in HVAC, lighting, motors, pumps and compressed air, verify results with IPMVP and convert kWh into avoided emissions and cash. Participants build a Site Energy Performance Improvement Plan for their own facility.

Course Objectives:

- Establish an energy policy, energy team and management system structure aligned with ISO 50001:2018 for a site or organisation
- Conduct an energy review that identifies significant energy uses and sets a normalised energy baseline and energy performance indicators
- Carry out a walk-through and detailed energy audit and record costed efficiency opportunities in a savings register
- Quantify savings for HVAC, lighting, motors, pumps, compressed air and on-site solar PV using engineering calculations and metered data
- Prepare a measurement and verification plan using the IPMVP options and convert verified kWh savings into avoided emissions
- Present investment-grade business cases for efficiency projects using simple payback, net present value and lifecycle cost

Target Audience:

- Managers accountable for site energy consumption, utility budgets and energy performance targets
- Facility and building services managers responsible for HVAC, lighting and building controls
- Maintenance and reliability managers who run motors, pumps, fans and compressed air systems
- Operations and plant managers who own production processes with high energy intensity
- Sustainability and environmental managers who need verified energy data for emission reduction targets
- Project and engineering managers who prepare and approve capital requests for efficiency upgrades

Course Outline:

Day 1: Energy Management Foundations and Current-State Assessment

- Energy Cost Structure: Tariffs, Demand Charges and Utility Bill Analysis
- Energy Policy Statement, Top Management Roles and Energy Team Charter
- ISO 50001:2018 Plan-Do-Check-Act Structure and Energy Management System Scope
- Metering Hierarchy and Sub-Metering Gap Assessment Checklist
- Energy Management Maturity Self-Assessment for the Participant Site

Day 2: Energy Review, Baseline and Performance Indicators

- Energy Review Procedure: Energy Sources, Uses and Consumption Mapping
- Significant Energy Use Identification with Pareto and Sankey Diagrams
- Energy Baseline Construction Using Regression Against Degree Days and Production
- Energy Performance Indicator Selection: Ratio, Regression and CUSUM Methods
- Energy Objectives, Targets and Action Plan Template

Day 3: Energy Audits and Efficiency Opportunities in Buildings and Plant

- Walk-Through and Detailed Energy Audit Method with Data Logger Toolkit
- HVAC and Chiller Plant Optimisation: Set Points, Scheduling and Variable Speed Drives
- Lighting Retrofit Calculations: LED Conversion, Occupancy and Daylight Controls
- Motor, Pump and Fan Efficiency: Affinity Laws and Right-Sizing Worksheet
- Compressed Air Leak Survey, Pressure Reduction and Heat Recovery

Day 4: Renewables, Savings Verification and Carbon Conversion

- On-Site Solar PV Screening: Roof Area, Yield Estimate and Self-Consumption
- IPMVP Options A, B, C and D Selection for Each Efficiency Measure
- Measurement and Verification Plan: Boundary, Adjustments and Reporting Period per M&V Guidelines 4.0
- Routine and Non-Routine Adjustments When Weather, Occupancy or Output Change
- kWh to Avoided Emissions Conversion Using Grid and Fuel Emission Factors

Day 5: Business Case Modelling and the Site Energy Performance Improvement Plan

- Efficiency Project Financial Model: Simple Payback, NPV, IRR and Lifecycle Cost
- Commercial Building Case: Prioritising a Retrofit Package Under a Fixed Budget
- Manufacturing Plant Case: Verifying Compressed Air and Motor Savings After Upgrade
- Site Energy Performance Improvement Plan Assembly with Baseline, EnPIs and M&V Plan
- Plan Presentation to a Mock Capital Approval Panel and Peer Challenge

Skills You Will Gain:

- Energy Data Analysis
- Energy Baseline Regression
- Significant Energy Use Mapping
- Energy Audit Fieldwork
- HVAC and Motor System Optimisation
- Savings Measurement and Verification
- Emission Factor Conversion
- Efficiency Investment Appraisal

Why Attend This Course:

- Return with a Site Energy Performance Improvement Plan built on your own utility and metering data
- Defend savings claims to finance and auditors with an M&V plan that adjusts for weather and output
- Win approval for efficiency projects by presenting payback and NPV in the language capital committees use
- Compare audit findings and retrofit results with peers from manufacturing, commercial buildings, healthcare and utilities in several countries

Conclusion:

Lasting energy savings come from a managed programme rather than one-off equipment purchases. This course moves from energy policy, metering and the ISO 50001:2018 structure, through the energy review, baseline and EnPIs, to audits and engineering savings in HVAC, lighting, motors, pumps and compressed air. It then covers solar PV screening, IPMVP-based verification and emission conversion, before the final day builds business cases and a Site Energy Performance Improvement Plan ready for management approval and implementation.