# Training Course on Energy Management in Airports and Aviation Facilities

Professional Development Training Course Outline

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| **Category** | Aviation and Airport Management | **Duration** | 10 Days |
| **Base Fee** | $3,000 USD | **Delivery Mode** | Online / On-site Hybrid |

## Course Introduction

Training Course on Energy Management in Airports and Aviation Facilities provides aviation professionals with the essential knowledge and practical skills to implement effective **energy management strategies** across airport infrastructure and aviation facilities. In an era of escalating **energy costs**, stringent **environmental regulations**, and the imperative for **carbon neutrality**, optimizing energy consumption is no longer optional but a strategic imperative. Participants will gain insights into **sustainable aviation**, **renewable energy integration**, and advanced **energy efficiency technologies** crucial for achieving operational resilience and reducing the industry's environmental footprint.

The aviation sector faces unique energy challenges, from powering vast terminal buildings and air traffic control systems to fueling ground support equipment and aircraft. This course will equip attendees with a holistic understanding of **airport energy audits**, **ISO 50001 implementation**, and the development of robust **energy performance indicators**. By focusing on practical application and real-world **case studies**, we empower participants to identify significant energy savings opportunities, drive **cost reduction**, and contribute to a greener, more sustainable future for global aviation.

## Programme Curriculum

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**Course Duration**

10 days

**Course Objectives**

1. Formulate and implement comprehensive **airport energy strategies** aligned with **sustainability goals** and **net-zero emissions** targets.
2. Master the methodologies for conducting thorough **energy audits** across diverse airport and aviation facilities, identifying key consumption areas and waste.
3. Understand and apply the principles of **ISO 50001 Energy Management Systems** for systematic energy performance improvement.
4. Identify and implement **HVAC optimization techniques** for significant energy savings in terminal buildings and other facilities.
5. Explore viable **renewable energy solutions** (solar PV, wind, geothermal) for airport operations and assess their feasibility.
6. Understand the concepts and benefits of **smart grid integration** for resilient and efficient airport power systems.
7. Develop strategies for the **electrification of ground support equipment (GSE)** and associated charging infrastructure.
8. Utilize **Building Energy Management Systems (BEMS)** and **IoT solutions** for real-time monitoring and control.
9. Leverage **energy data analytics** and **AI-driven insights** to predict consumption patterns and identify anomalies.
10. Integrate energy management into broader **airport carbon management plans** to achieve emissions reduction targets.
11. Understand the role and impact of **Sustainable Aviation Fuels (SAF)** on overall airport energy demand and emissions.
12. Assess the latest **energy-efficient lighting (LED)**, insulation, and building envelope technologies for airport applications.
13. Promote **stakeholder collaboration** and cross-functional teams to drive energy efficiency initiatives across the airport ecosystem.

**Organizational Benefits**

- Directly impact operational budgets through reduced energy consumption and optimized utility procurement.
- Improve the organization's environmental, social, and governance (ESG) standing, attracting environmentally conscious investors and customers.

- Ensure adherence to evolving national and international environmental regulations, minimizing penalties and reputational damage.
- Foster greater energy independence and resilience against energy price volatility and supply disruptions.
- Demonstrate leadership in environmental stewardship, enhancing public perception and competitive advantage.
- Empower staff with knowledge and skills to contribute to sustainability initiatives, fostering a culture of efficiency.
- Qualify for various green financing options and incentives for sustainable infrastructure projects.
- Drive adoption of cutting-edge energy technologies, positioning the organization as an industry innovator.

**Target Audience**

1. Airport Operations Managers
2. Airport Environmental Managers & Officers
3. Facilities Management & Maintenance Teams
4. Airport Engineers (Electrical, Mechanical, Civil)
5. Sustainability Coordinators in Aviation
6. Airline Ground Operations Personnel
7. Government & Regulatory Officials (Civil Aviation Authorities)
8. Energy Consultants specializing in Aviation

**Course Outline**

**Module 1: Introduction to Airport Energy Dynamics**

- Understanding the unique energy landscape of airports: airside, landside, and terminal operations.
- Key energy consumption drivers: HVAC, lighting, ground support, air traffic control.
- Global trends in aviation sustainability and the push for decarbonization.
- The economic and environmental imperative for energy management in airports.
- **Case Study**: Analyzing the energy profile of a major international hub airport (e.g., London Heathrow or Atlanta Hartsfield-Jackson) and identifying its top energy consumption categories.

**Module 2: Energy Policy & Regulatory Frameworks**

- International (ICAO, EU ETS) and national energy efficiency regulations.
- Voluntary initiatives and industry benchmarks (e.g., ACI Airport Carbon Accreditation).
- Compliance requirements and reporting mechanisms for energy consumption.
- The role of policy in driving sustainable energy transitions in aviation.
- **Case Study**: Examining how a specific airport (e.g., Copenhagen Airport) has adapted its energy strategy to comply with evolving national and European Union energy directives.

**Module 3: Energy Auditing & Baseline Establishment**

- Methodologies for conducting comprehensive Level 1, 2, and 3 energy audits.
- Establishing an accurate energy baseline and key performance indicators (EnPIs).
- Data collection, measurement, and verification (M&V) techniques.
- Identifying energy waste and inefficiency hotspots across airport facilities.
- **Case Study**: A detailed look at an energy audit conducted at a regional airport, showcasing the findings and initial recommendations for energy savings.

**Module 4: ISO 50001 Energy Management Systems (EnMS)**

- Principles and requirements of the ISO 50001 standard for EnMS.
- Steps to implement and certify an EnMS at an airport.
- Benefits of a structured EnMS: continuous improvement, cost savings, compliance.
- Integrating EnMS with existing environmental management systems (ISO 14001).
- **Case Study**: How Zurich Airport successfully implemented ISO 50001, highlighting challenges overcome and tangible energy performance improvements.

**Module 5: HVAC System Optimization**

- Advanced HVAC technologies: variable refrigerant flow (VRF), geothermal, demand-controlled ventilation.
- Strategies for optimizing chiller plant efficiency, air handling units (AHUs), and pumping systems.
- Building envelope improvements: insulation, window upgrades, shading devices.
- Commissioning and recommissioning of HVAC systems for sustained performance.
- **Case Study**: Reviewing a project where an airport (e.g., Changi Airport) significantly reduced HVAC energy consumption through a combination of technology upgrades and operational adjustments.

**Module 6: Lighting Efficiency & Smart Controls**

- Transitioning to LED lighting: benefits, ROI, and implementation considerations.
- Daylighting strategies and integration with artificial lighting.
- Smart lighting controls: occupancy sensors, daylight harvesting, scheduling.
- Outdoor lighting optimization: apron lighting, taxiway lights, parking areas.
- **Case Study**: Analyzing the energy savings achieved by an airport (e.g., San Francisco International Airport) after a large-scale LED retrofit program.

**Module 7: Ground Support Equipment (GSE) Electrification**

- The business case for electrifying GSE: environmental, economic, and operational benefits.
- Types of electric GSE: baggage tractors, pushback tugs, passenger stairs.
- Charging infrastructure requirements and smart charging strategies.
- Challenges and solutions for transitioning to an electric GSE fleet.
- **Case Study**: Examining how an airport (e.g., Amsterdam Schiphol Airport) is phasing in electric GSE and the impact on energy demand and emissions.

**Module 8: Renewable Energy Integration for Airports**

- Solar PV installations: rooftop, ground-mounted, and innovative applications.
- Wind energy potential and feasibility for airport sites.
- Geothermal heating and cooling systems for airport buildings.
- Biomass and waste-to-energy solutions for airport waste streams.
- **Case Study**: The journey of Cochin International Airport, the world's first fully solar-powered airport, and the lessons learned from its renewable energy integration.

**Module 9: Smart Grids & Energy Storage**

- Concepts of airport microgrids and smart grid technologies.
- Battery energy storage systems (BESS) for peak shaving, demand response, and grid stability.
- Integration of distributed energy resources (DERs) within the airport network.
- Utilizing smart grid technology for enhanced energy resilience and security.

- **Case Study**: How a pilot program at a European airport is experimenting with a localized microgrid to optimize energy flow and reduce reliance on the main grid.

**Module 10: Advanced Building Energy Management Systems (BEMS)**

- Leveraging BEMS for centralized monitoring, control, and optimization of building systems.
- Integration of sensors, IoT devices, and data analytics platforms.
- Predictive maintenance and fault detection using BEMS data.
- Cybersecurity considerations for networked building control systems.
- **Case Study**: Exploring how a major terminal building at an airport uses a sophisticated BEMS to achieve significant energy savings and operational efficiencies.

**Module 11: Energy Data Analytics & Performance Reporting**

- Tools and platforms for collecting, analyzing, and visualizing energy data.
- Identifying consumption patterns, anomalies, and opportunities for improvement.
- Developing effective energy performance dashboards and reports for stakeholders.
- Using data analytics to drive continuous improvement in energy management.
- **Case Study**: An airport's journey in implementing a robust energy data analytics platform, showcasing insights gained and actionable strategies developed.

**Module 12: Carbon Management & Offsetting Strategies**

- Understanding airport carbon footprints and emissions scopes (Scope 1, 2, 3).
- Developing and implementing airport carbon reduction roadmaps.
- Carbon offsetting mechanisms and their role in achieving net-zero goals.
- The link between energy management and overall carbon reduction strategies.
- **Case Study**: How an airport (e.g., Melbourne Airport) is progressing towards its carbon neutrality target through a combination of energy efficiency and carbon offsetting projects.

**Module 13: Sustainable Aviation Fuels (SAF) & Energy Nexus**

- Overview of SAF production pathways, types, and their environmental benefits.
- The role of airports in facilitating SAF adoption and infrastructure.
- Impact of SAF on airport energy demand and emissions from aircraft operations.
- Policy support and incentives for SAF development and deployment.
- **Case Study**: Examining an airport's strategy for integrating SAF into its operations, including storage and fueling infrastructure considerations.

**Module 14: Funding & Financing Energy Efficiency Projects**

- Identifying funding opportunities: grants, incentives, green bonds.
- Developing a strong business case for energy efficiency investments.
- Financial analysis techniques: ROI, payback period, life cycle costing.
- Public-private partnerships (PPPs) for sustainable infrastructure development.
- **Case Study**: A detailed look at how a medium-sized airport secured funding for a large-scale renewable energy project and the financial benefits realized.

**Module 15: Future Trends & Innovation in Airport Energy**

- Emerging technologies: hydrogen power, vertical take-off and landing (VTOL) infrastructure.
- The concept of energy-positive airports and smart city integration.
- Artificial intelligence (AI) and machine learning (ML) for predictive energy management.
- Circular economy principles in airport operations and resource efficiency.

- **Case Study**: A forward-looking analysis of an airport (e.g., Oslo Airport) that is actively exploring and investing in future energy technologies for long-term sustainability.

**Training Methodology**

This course will employ a blended learning approach designed for maximum engagement and practical application.

- **Interactive Lectures**: Concise presentations introducing key concepts and principles.
- **Expert-Led Discussions**: Facilitated discussions to explore industry best practices, challenges, and solutions.
- **Real-World Case Studies**: In-depth analysis of successful energy management projects at airports globally.
- **Practical Exercises & Workshops**: Hands-on activities including energy audit simulations, data analysis tasks, and strategy development.
- **Group Activities**: Collaborative problem-solving sessions to foster peer learning and networking.
- **Q&A Sessions**: Dedicated time for participants to address specific queries and concerns.
- **Optional Site Visits (if feasible)**: Opportunities to observe energy management systems in action at a local airport or facility.

**Register as a group from 3 participants for a Discount**

**Send us an email:** info@fineskilltrainingcenter.org **or call** *+254769199797*

***Certification***

*Upon successful completion of this training, participants will be issued with a globally- recognized certificate.*

***Tailor-Made Course***

*We also offer tailor-made courses based on your needs.*

**Key Notes**

**a.** The participant must be conversant with English.

**b.** Upon completion of training the participant will be issued with an Authorized Training Certificate

**c.** Course duration is flexible and the contents can be modified to fit any number of days.

**d.** The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

**e.** One-year post-training support Consultation and Coaching provided after the course.

**Upcoming Scheduled Sessions**

| Start Date | End Date | Location | Price |
|---|---|---|---|
| **23 Nov 2026** | 04 Dec 2026 | Online | $2,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $3,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $6,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $6,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $12,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $9,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $12,000 |
| **23 Nov 2026** | 04 Dec 2026 | Physical | $12,000 |

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