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BASICS OF AIRPORT ENERGY MANAGEMENT

ONLINE TRAINING BY KRISHNAJI PAWAR

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MODULE
L5

Key Energy Consumption Areas in Airports

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BASICS OF AIRPORT ENERGY MANAGEMENT

Energy consumption at airports is influenced by factors like size, climate, comfort levels, services, operational hours, and passenger volumes. Airports have airside components (airfield operations) and landside elements (terminal buildings and parking). Key facilities include terminals, cargo buildings, and parking areas, with airside operations crucial for aircraft activities, including control towers and airfield lighting.

Learning Objectives

- Course Overview and Introduction
- Airports- Energy & Sustainability Perspectives
- Overview of energy use in airport environments
- Importance of conservation in aviation sustainability.
- Key energy consumption areas in airports
- Global trends in energy efficiency
- Energy Consumption Reduction Plan
- Benefits of energy management
- Summary and resources

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INTRODUCTION

- Energy consumption in airports is influenced by factors including airport size, climate conditions, comfort levels, services provided, operational hours, and passenger numbers.
- Airports are divided into airside (airfield and related buildings) and landside areas (terminal building and parking).
- Landside activities are connected to passenger movement and processing, while airside encompasses aircraft operations.
- Common facilities include terminal buildings, cargo buildings, and vehicle parking areas.
- The terminal building is the most energy-intensive area, consuming over 75% of total energy at Santander Airport.



MAJOR ENERGY CONSUMERS AT SANTANDER AIRPORT



- Major energy consumers at Santander Airport are:
  - HVAC systems: 24.5%
  - Lighting: 19.8%
  - External companies: 11.8%
  - Information and communication technologies: 18.3%
  - Airfield lighting: 6.9%
  - Radio navigation systems: 4.8%
  - Electromechanical facilities: 2.4%
  - Others: 11.5%
- Energy use by external companies affects overall airport HVAC and lighting consumption, leading to a potential higher HVAC share in combined statistics.

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AIRPORTS AREAS







IMPORTANCE OF HVAC SYSTEMS IN AIRPORTS



- HVAC systems (Heating, Ventilation, and Air Conditioning) are crucial for maintaining comfort in busy airport environments.
- Heating ensures passenger and staff comfort during cold weather, while cooling is essential in hot conditions.
- Proper ventilation improves air quality by filtering out pollutants, which is vital in crowded terminals.
- Effective HVAC systems contribute to health and safety by reducing the spread of germs and viruses.
- They support aircraft performance by providing a stable environment necessary for internal systems.
- Energy-efficient HVAC designs lead to significant cost savings in large airport facilities.
- Notable examples include Hartsfield-Jackson Atlanta International Airport, which utilizes smart technology for energy management, and Singapore Changi Airport, known for its advanced HVAC system that controls humidity and maintains comfort amid high passenger volumes.
- The increasing growth in air travel highlights the indispensable role of HVAC systems in airport infrastructure.

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IMPORTANCE OF HVAC SYSTEMS IN AIRPORTS +

- Airport buildings have high energy consumption, comparable to small cities, warranting optimization.
- Key factors affecting energy consumption include airport size, climate, comfort levels, services offered, operational hours, and passenger traffic.
- Comparisons of energy use across airports should be approached with caution.
- Significant energy saving potentials identified include:



- Energy-efficient HVAC systems
- Architectural improvements
- Enhanced energy management and control
- Increased efficiency in energy supply and renewable energy use
- Improved transportation efficiency for passengers and baggage



IMPORTANCE OF HVAC SYSTEMS IN AIRPORTS +



- The source of electricity production and its emission factor are crucial when switching to electric fuel.
- The reliance on fossil fuels for electricity currently contributes negatively to greenhouse gas emissions.
- Transitioning to renewable energy in electricity generation is anticipated to improve future outcomes.
- Energy management and control measures are recommended as immediate to near-term solutions.
- Long-term strategies should include onsite photovoltaic electricity generation for decarbonizing systems like HVAC and electric GSE.

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