



Environment Planning

Dr. Joe Sulmona

Istanbul Technical University
Air Transportation Management
M.Sc. Program

Airport Planning and Management

Module 14

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Outline

A. Introduction

B. Environment Management System

C. Project Impact Assessment

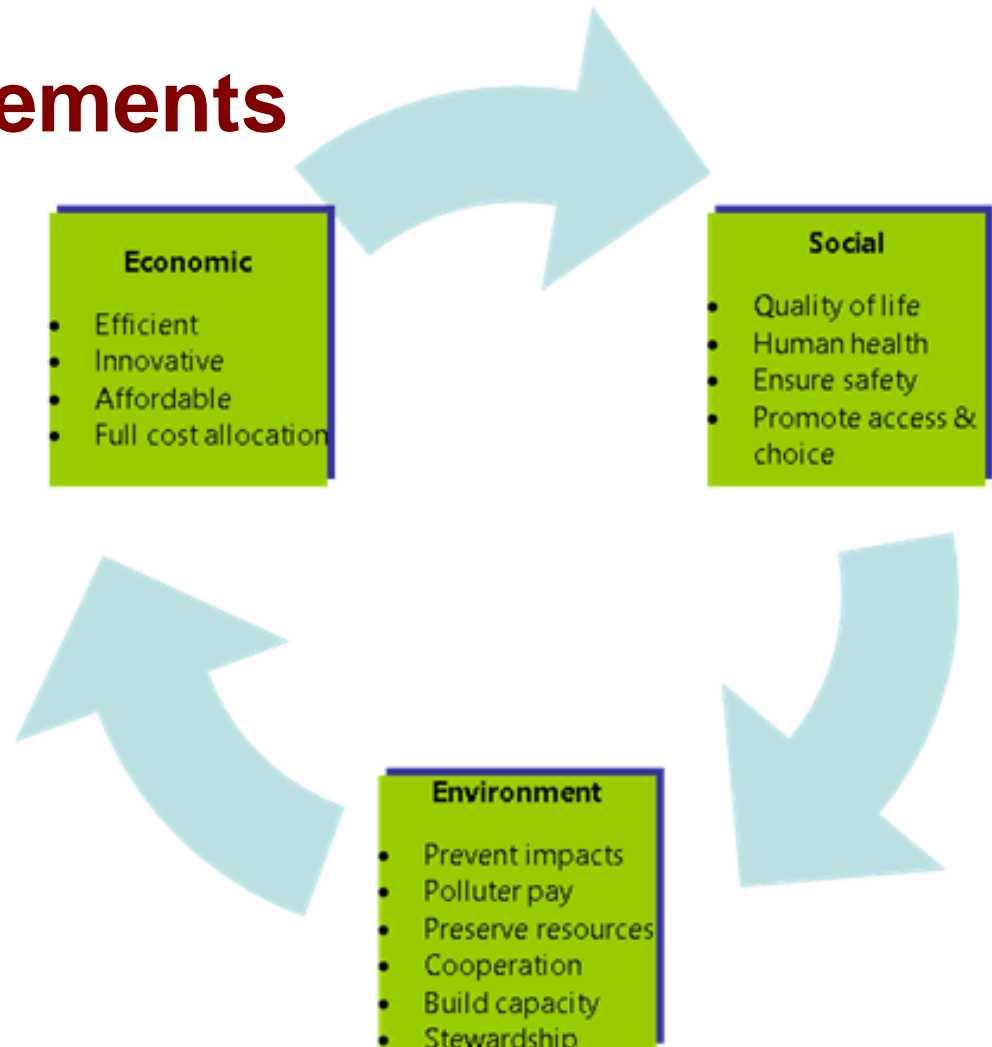
D. Conclusions

Introduction



Sustainable Development Objectives

- **Interactive Elements**



Sustainable Development Objectives

- **Interactive Elements**

- Within strategic airport management, role of social, economic, environmental issues must be given equal consideration to airport operational priorities
- Dependence of modern society on high-quality transportation of people and goods by air is creating tensions with other societal goals
- Balanced responses to these conflicts, demand proactive management of a Sustainable Development (SD) philosophy

Sustainable Development Objectives

- **Interactive Elements**

- Wide-ranging and generates impacts at local, regional, and global levels
- Cooperation to achieve practical and reasonable solutions
- Starting point is Strategic Plan, which must identify and reinforce SD to guide governance and management decision-making

ENVIRONMENTAL POLICY

At the Manchester Airport Group, we believe that successful environmental management incorporates every area: so as well as reducing carbon emissions, we also work hard to manage and control our impacts relating to water, waste, ecology, noise and land use.

Sustainable Development Objectives

- **Voluntary ISO Standards (14001)**
 - Responsible improvement includes monitoring and auditing of entire planning through construction and operations with the objective of improving performance and ensuring regulatory compliance
 - Widespread participation that engages staff and contractors through training and information activities which supports corporate policies
 - Transparent partnerships and dialogue are crucial for generating solutions to achieve mutual interests, including the use of formal reporting mechanisms to demonstrate progress and foster awareness

Sustainable Development Objectives

- **Regulatory Compliance**

- Airports are subject to range of approvals, including capital market discipline in its decision-making
- Permanent consultations mechanisms contribute to understanding externalities, thus voluntary approaches preferred over regulatory requirements
- Investing in Corporate Social Responsibility initiatives are necessary to demonstrate leadership position amongst global airport managers
- Compliance trajectories are strengthening so best to remain ahead of regulatory demands

Manchester Airport Group Example

SUMMARY

SUSTAINABLE DEVELOPMENT PLAN 2015



stanstedairport.com

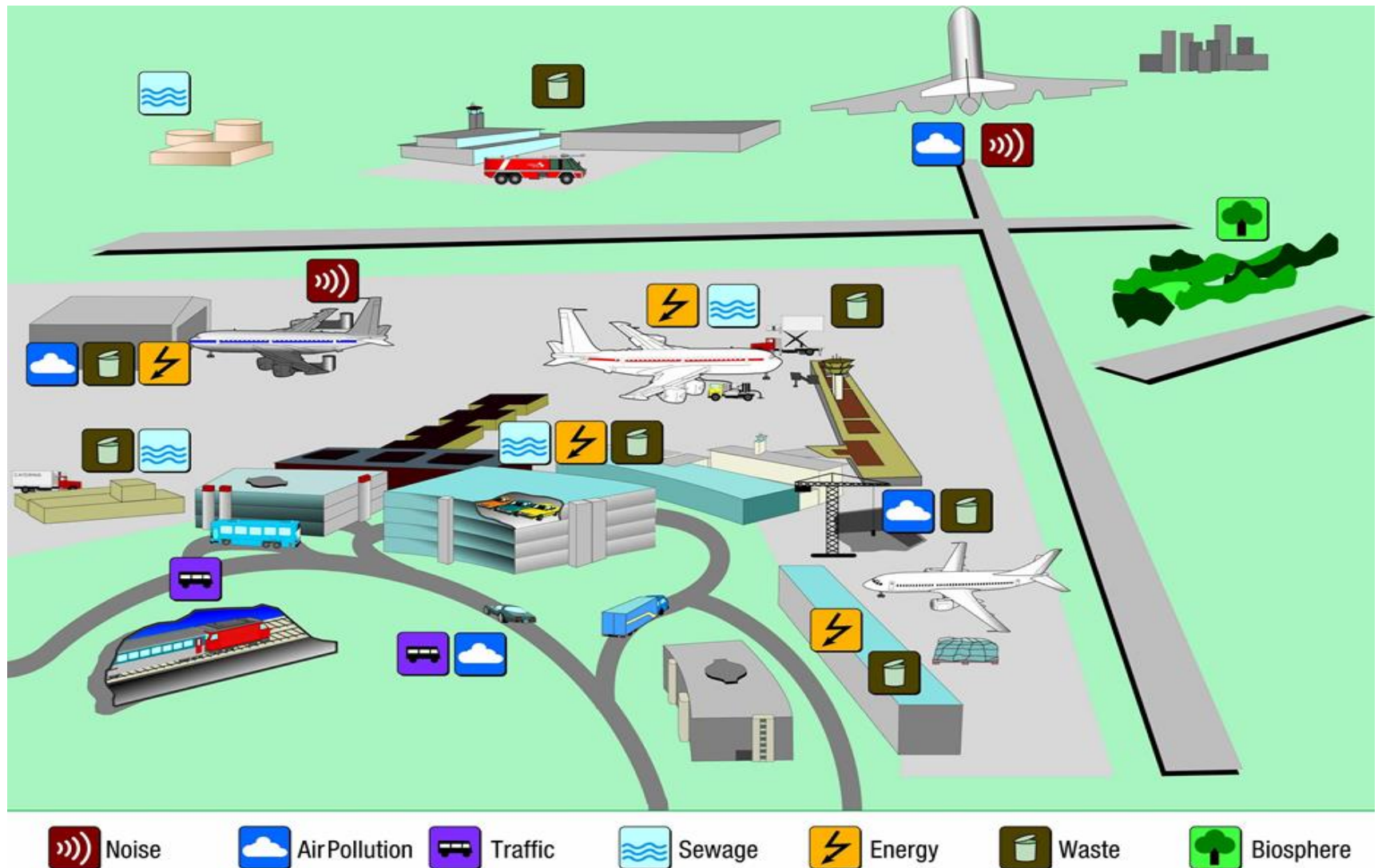


PART OF M.A.G

Environment Management System



Environment Management System



Environment Management System

- Airport Issues**



- Environmental Management Plan**

Environment Management Issues

- **Local Air Quality**

- Various sources include road traffic, aircraft idling, apron ground handling, and building HVAC
- Issues primarily surround health impacts for staff and local community
- Domestic regulation with growing science regarding particulate types that generate systemic pathologies

- **Management Practice**

- Monitor on and off-site
- Implement emission reduction action plans

Environment Management Issues

- **Water Quality**
 - Sources include aircraft apron activities, de-icing, dumps, building waste, and spills
 - Consequence include soil pollution, drinking and surface contamination, and habitat destruction
 - Trans-national rules where water systems impact other jurisdictions



Environment Management Issues

- **Water Quality Management Practice**
 - Appropriate infrastructure to reduce spill impacts
 - Soil cleansing and removal strategies
 - Operational systems to reduce risks
- **Mitigation Planning**
 - Clean-up costs
 - Fines and imprisonment, in some instance possible
 - Implications for airport privatization as liability for pollution will depend on national law obligations

Environment Management Issues

- **Habitat Protection**

- Need for large flat areas without nearby obstacles results in airports located in green-belt areas or near large water bodies
- National and international protection available for protected species and migratory birds
- Often generates airport capacity constraints

- **Management Practice**

- Identify threat and conservation opportunities
- Off-site rehabilitation areas for on-site damage

Environment Management Issues

- **Operational Risks**

- Sources include road and aircraft accidents
- Hazardous goods growing in importance as air transportation used for expedited handling

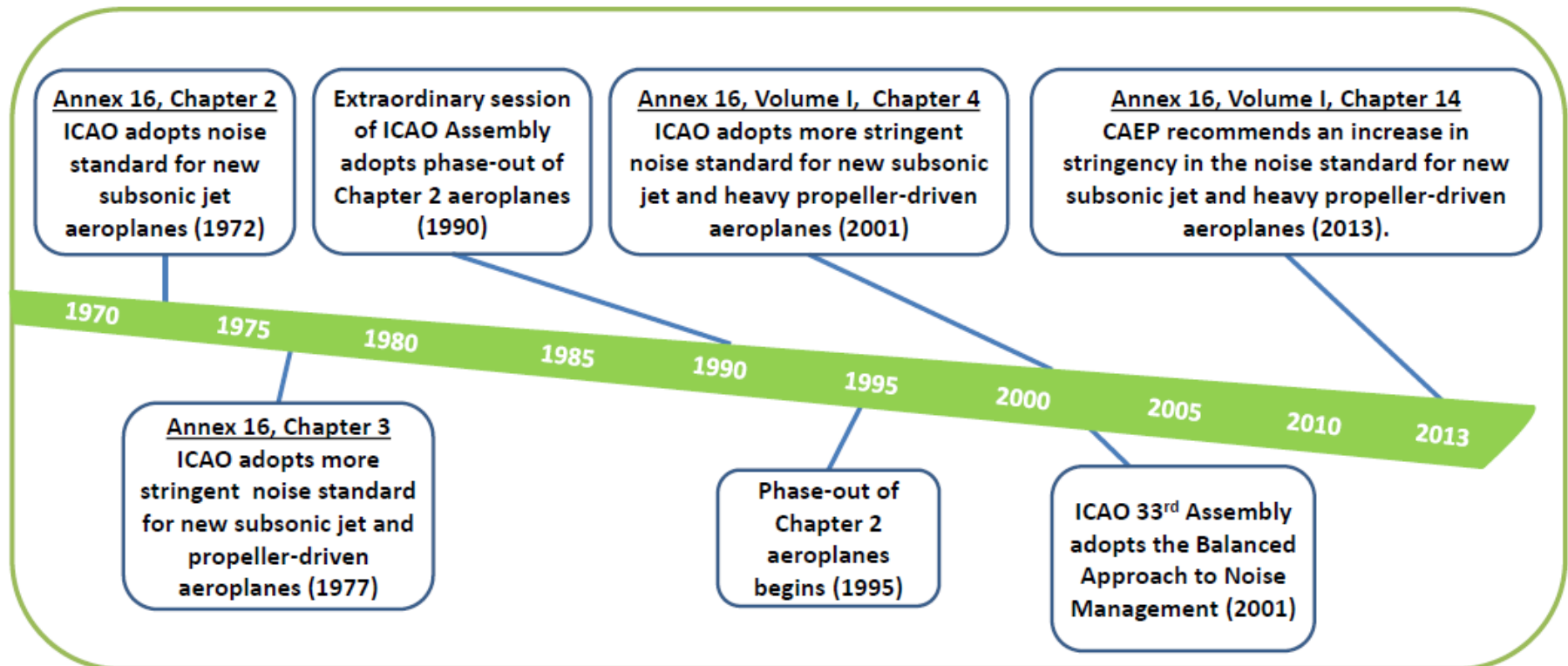
- **Management Practice**

- Develop risk management and modeling capacity
- Understand and manage public awareness
- Effective Operational and Emergency Planning
- Liaison with speciality response agencies

Environment Management Issues

- ## Noise Management

- ICAO adopt a new, more stringent aircraft noise certification for new aircraft designs in 2017

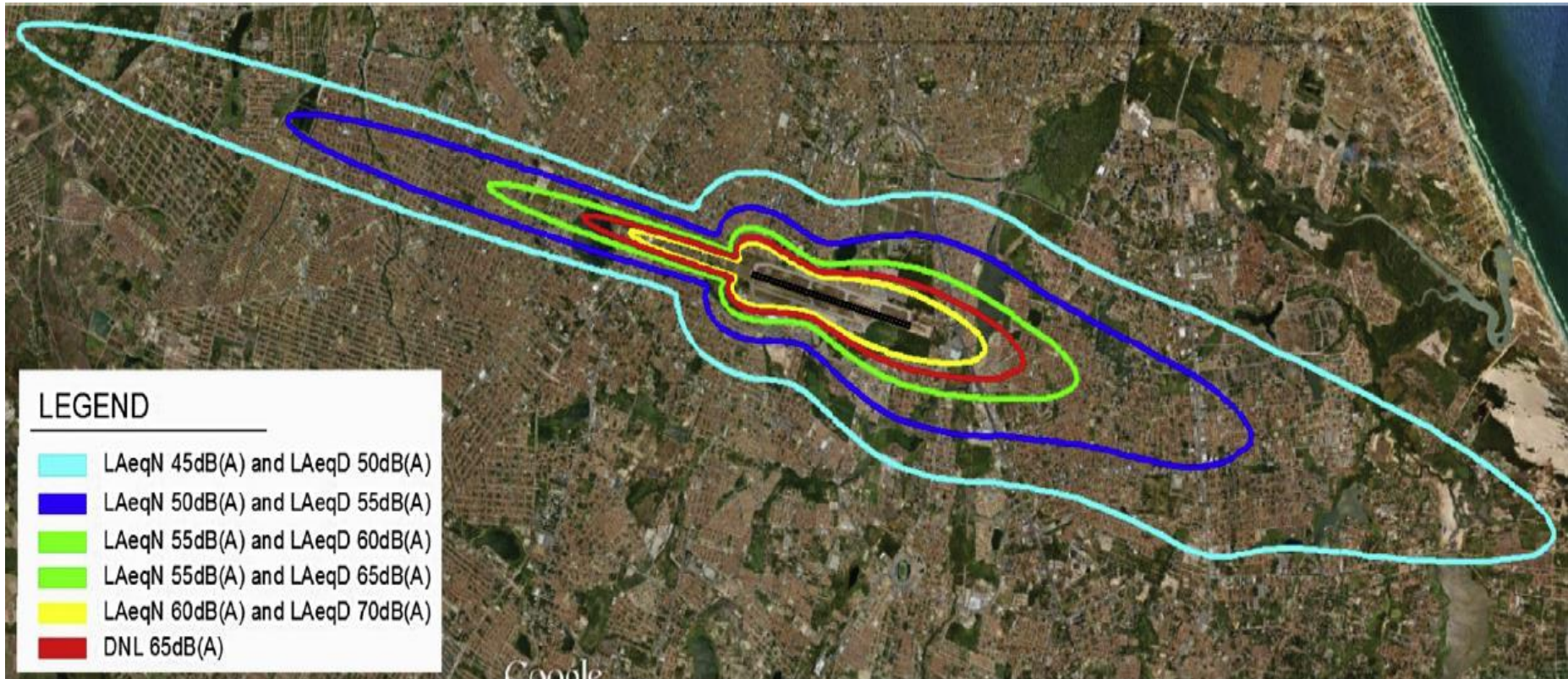


Environment Management Issues

- **Noise Management**

- Global improvement through aircraft technology development and global ICAO agreements
- Airframe noise another source more difficult to reduce as aircraft get larger
- Airport source from building energy supply, ramp / road vehicles, aircraft maintenance / engine run-ups
- Public views aircraft noise as controllable by the airport
- Political attention is local, but solutions often require national or even international cooperation

Environment Management Issues



Heleno, T.A. et al., 2014, Analysis of airport noise through LAeq noise metrics

Environment Management Issues

- **Noise Management Practice**
 - Active management of all noise sources
 - Introduce corporate purchasing standards that includes noise metrics for equipment purchases
 - Recognize noise from construction can be harmful, even if only for short-term periods
 - Introduce noise penalties and threshold limits
 - Create non-exceed noise exposure envelopes
 - Contribute to development of better noise metrics
 - Engage community understand local impacts

Environment Management Issues

- **Carbon Footprint**
 - Greenhouse gas (GHG) refer to substances that retain heat within atmosphere, which contribute to climate change
 - Kyoto Protocol includes
 - Carbon dioxide (CO₂)
 - Methane (CH₄)
 - Nitrous oxide (NO)
 - Hydrofluorocarbons (HFCs)
 - Perfluorocarbons (PFCs)
 - Sulphur hexafluoride (SF₆)




Environment Management Issues

- **Carbon Footprint**
 - Aviation is responsible for a relatively small proportion of greenhouse gas emissions estimated less than 2% of global GHGs
 - Airports in turn contribute around 5% of these aviation emissions
 - Aviation industry growth, combined with aggressive efforts by other industries to de-carbonise means that aviation emissions are likely to rise to around 3% of total global emissions by 2050
 - Airport leadership to reduce emission contributions

Environment Management Issues

- **Carbon Management Excellence**



**airport
carbon
accreditation**
MAPPING | REDUCTION | OPTIMISATION | NEUTRALITY


Airports & CO2

Home » Airports & CO2 » 4 Levels of Certification » Introduction


4 Levels of Certification

The programme provides a unique common framework and tool for active carbon management at airports with measurable results. It covers the operational activities that contribute most to carbon emissions. It is site specific and can be used at any airport as part of its daily environmental management activity and long term strategy as it helps to guide and support airport environmental management through a process of continual improvement and partnership with its airport stakeholders.

- + **MAPPING**
Footprint measurement
- + **REDUCTION**
Carbon management towards a reduced carbon footprint
- + **OPTIMISATION**
Third party engagement in carbon footprint reduction
- + **NEUTRALITY**
Carbon neutrality for direct emissions by offsetting



ANNUAL REPORT
2013-2014 | June 14



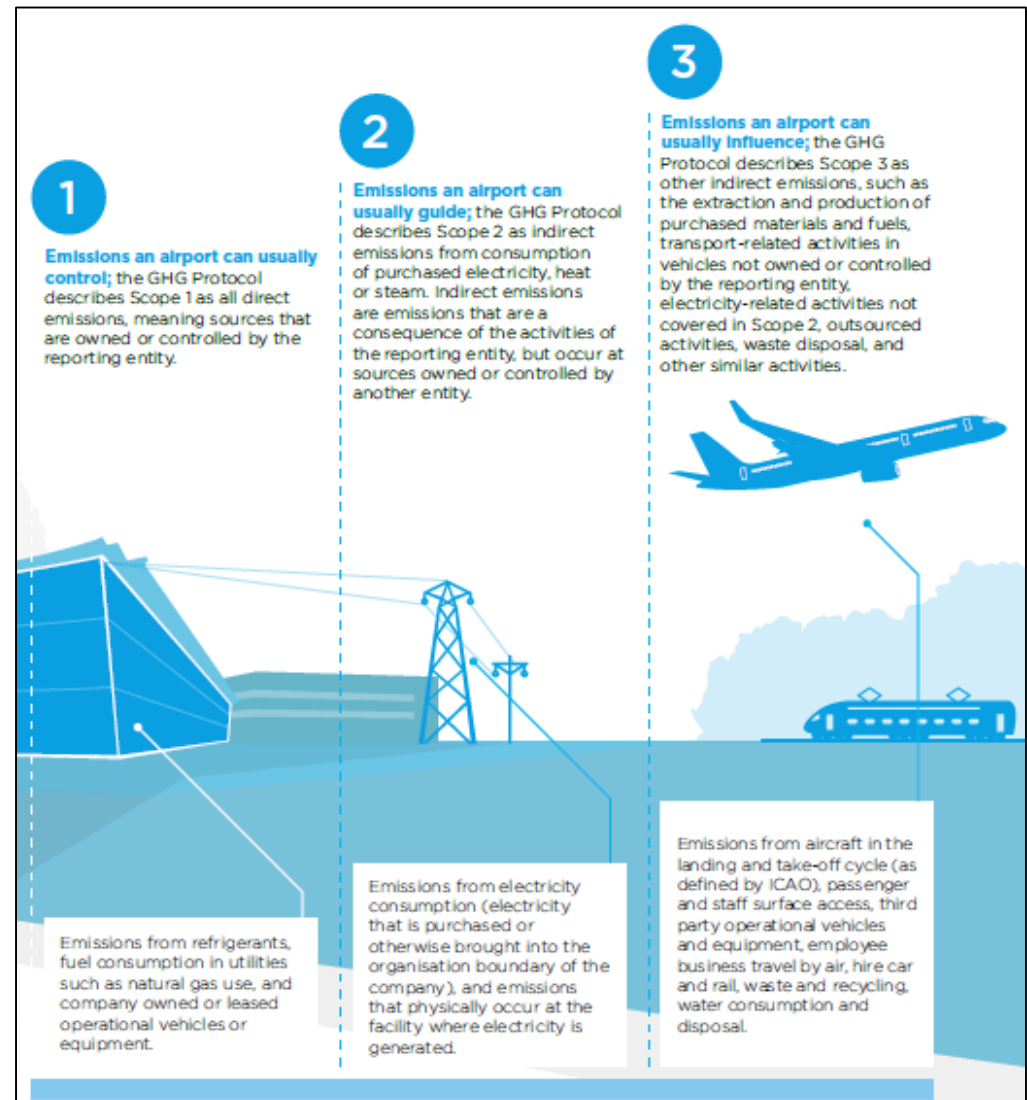
**airport
carbon
accreditation**
MAPPING | REDUCTION | OPTIMISATION | NEUTRALITY

Video - <http://www.airportcarbonaccreditation.org/>

Environment Management Issues

- ## Airport Carbon Strategy

U.K. Airport Operators Association, 2014



Environment Management Issues

- **Measure Footprint**

Source 1

- Power plant / emergency generators
- Airport fleet vehicles
- Airport maintenance
- Airport-owned Ground Support Equipment
- Fire training

Source 2

- off-site energy purchased by airport

Source 3

- Aircraft engines for landing and taxiing
- Aircraft Auxiliary Power Units (APU)
- GSE / airside vehicles
- Ground access vehicles (incl bus and rail)
- Corporate travel
- Construction
- Aircraft maintenance
- Off-site waste disposal

Environment Management Issues

- **Carbon Management Practice**

- Reduce demand for energy through efficiency measures and engage staff and partner companies
- Invest in low carbon technology such as lighting and fuel efficient vehicles, and meet energy needs through renewable or low carbon energy technologies such as solar power or biomass
- Monitor and measure energy performance, targeting areas of high consumption or emissions
- Establish external performance standards and report on progress through trusted sources

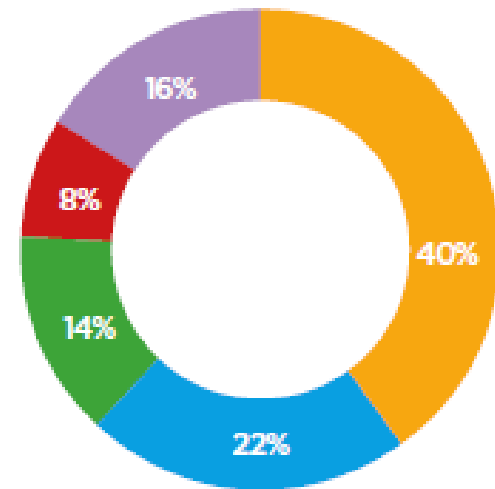
Environment Management Plan

- **Tool to enable airports to:**
 - Assess the environmental impacts of activities
 - Establish strategies, goals, and measures to prevent or minimize harmful impacts
 - Develop and retain intellectual concepts
 - Meet and preferably exceed legal requirements
 - Most importantly, maintain focus on continuous improvement of environmental protection system

Environment Management Plan

- **EMP Contents**
 - Mission and objectives
 - Roles and responsibilities
 - Environmental programs
 - Communications
 - Audit and monitoring
 - Training and awareness
 - Project Impact Assessment

Percentage of UK transport emissions



Environment Management Plan

- **Mission and Objectives**
 - Integrate environment as priority
 - Pro-active risk management
 - Respect “rules of the day” that are increasing
 - Ensure ability to respond to system failures that could lead to environmental degradation
 - Skills development across airport systems
 - Continuous improvement
 - Communicate EMP for good or bad

Environment Management Plan

• Roles and Responsibilities

- Policy makers
- Board, corporate management and staff
- Airport tenants, suppliers, and partners
- Public and stakeholder interests

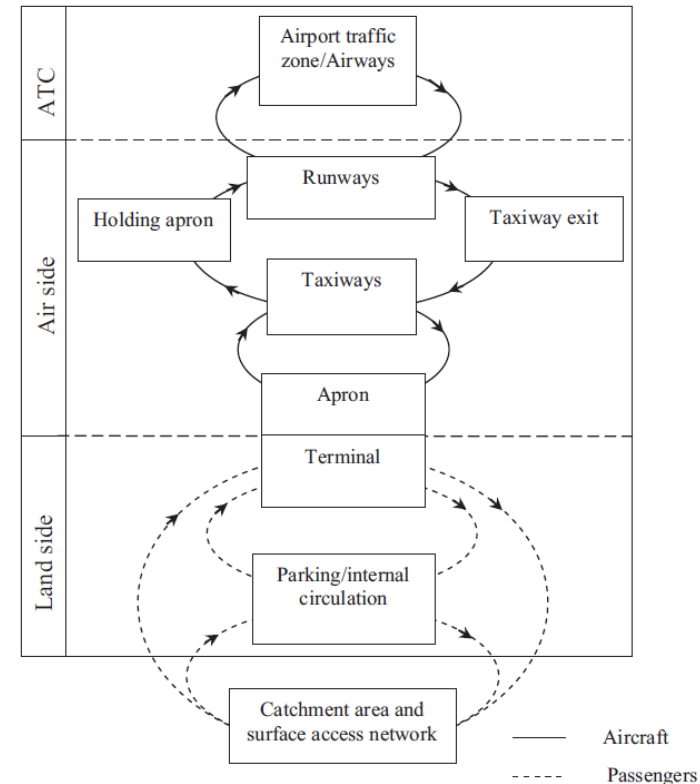


Fig. 1. Airport operations.

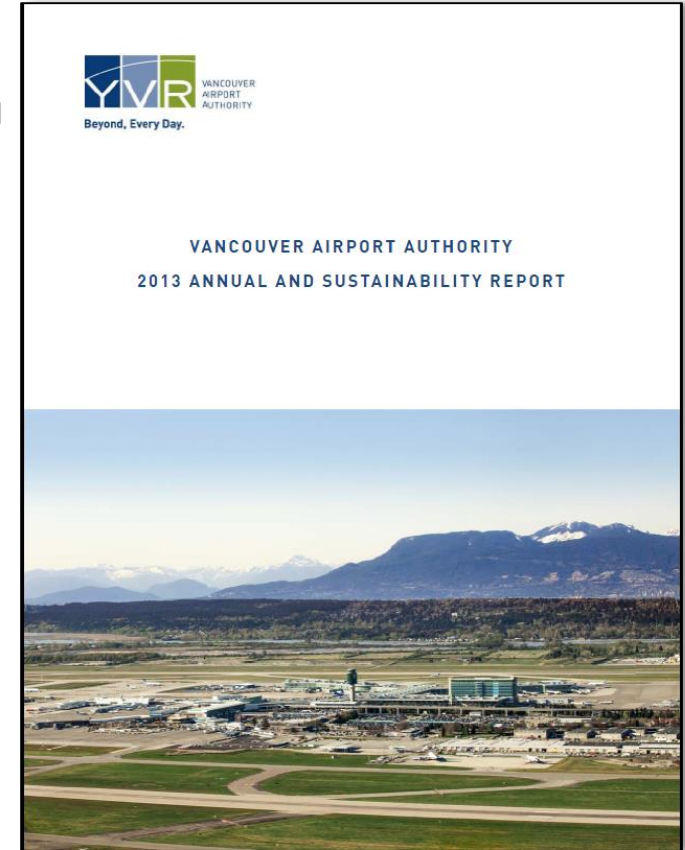
Postorino, M.N., L., 2014, A transport carbon footprint methodology to assess airport carbon emissions

Environment Management Plan

- **Select Program Examples**
 - Noise management
 - Standard operating procedures
 - De-icing, sewage, international garbage
 - Building permits
 - Environmental emergency response
 - Air, water and ground quality management
 - Habitat and archaeological resource protection

Environment Management Plan

- **Communications**
 - **Environment Advisory Forum**
 - Input on EMP including diverse community and other interests
 - **Aeronautical Noise Forum**
brings together stakeholders on specific neighbourhood issues
 - Routine public reporting



Environment Management Plan

- **Audit and Monitoring**
 - Best-practice programs such as ISO 14001 for environmental programs and 5001 for energy management
- **Training and Awareness**
 - Ongoing and necessary for risk management

CERTIFICATE

EN ISO 14001 : 2004
Environmental Management System

**AIB-VINÇOTTE
INTERNATIONAL Ltd,**
Brussels - Belgium

This is to certify that: **THE BRUSSELS AIRPORT COMPANY**

Located at: **Brussels National Airport
1930 ZAVENTEM
Belgium**

has established and maintains an environmental system according the requirements of
EN ISO 14001 : 2004 "Environmental Management System" for:

Building and running airport infrastructure

This certificate is based on the result of an environmental audit documented in the audit report **60334046**.

Certificate number: 00 EMS 043d
First issued: 27 February 2006
Date of issue: 12 March 2012
This certificate expires on: 26 February 2015

Further clarifications regarding the scope of this certificate and the applicability of
EN ISO 14001 : 2004 requirements may be obtained by consulting the organization.

This certificate is granted subject to AIB-Vinçotte International's Ltd General Regulations.



Signed for the certification body:

A handwritten signature in blue ink, appearing to read "Bart Janssens".

Bart Janssens
Chairman Certification Committee



Project Impact Assessment



Project Impact Assessment

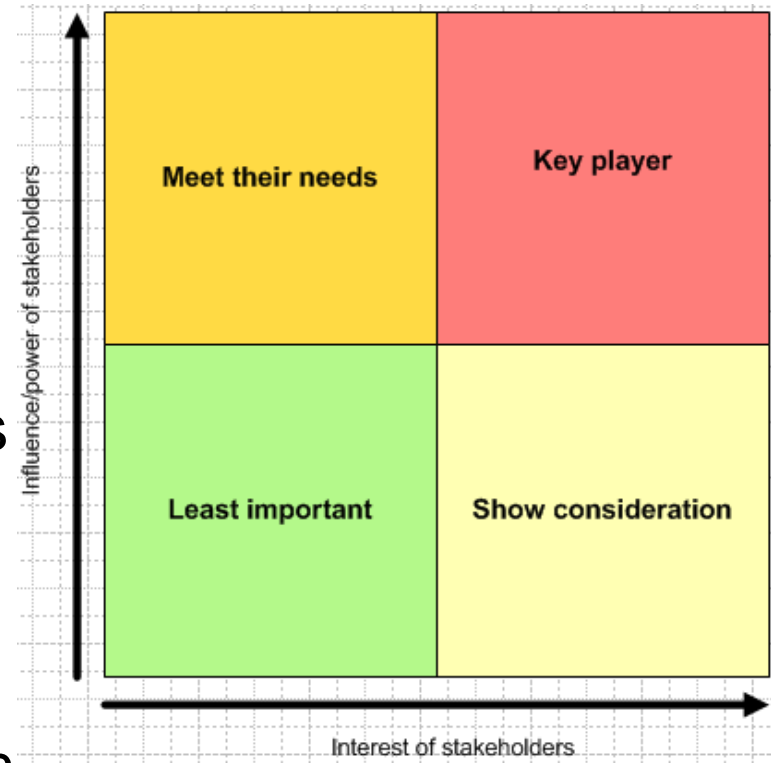
- **Strategic Objective**

- Applying SD as project evaluation criteria is best-practice, which contributes to the integration of broader criteria for all on and off-site planning efforts
- Given potential for serious impacts to areas around airports, broader impact assessment required
- Consider local culture and industrial formations to avoid creating frictions and tension
- As a core focus, SD can then guide detailed design and operational planning phases that take advantage of useful experiences from elsewhere

Project Impact Assessment

- **Strategic Objective**

- Incorporate SD into project evaluation framework which can generate harmony amongst conflicting priorities which will emerge as implementation becomes closer to reality
- Reinforce need for long-term view, which also recognizes airport cumulative impacts on future generations



Evaluation Framework

- **Effective Governance**
 - Strategic focus at corporate level and demands prioritization to ensure economic, social, and environmental interests are accounted for in planning, design, construction, and operations
 - Best-practice requires consistent application
 - Subsidiary
 - Responsibility
 - Transparency
 - Participation
 - Act without full certainty
 - Leadership

Evaluation Criteria

- **Economic Checklist**

- ☐ Operational capacity
- ☐ Customer service efficiency
- ☐ Capital allocation
- ☐ Maintenance life-cycle costs
- ☐ Revenue enhancement
- ☐ Agency / supplier partnerships
- ☐ Technology innovation
- ☐ Situational & facility flexibility
- ☐ Investment level finance structure
- ☐ Phasing & Constructability

Evaluation Criteria

- **Environment Checklist**
 - ☐ Flora and fauna species protection
 - ☐ Terrestrial, aquatic and avian habitat
 - ☐ Climate change impacts
 - ☐ Local air quality
 - ☐ Energy use and generation
 - ☐ Land allocation
 - ☐ Ground & surface water quality

Evaluation Criteria

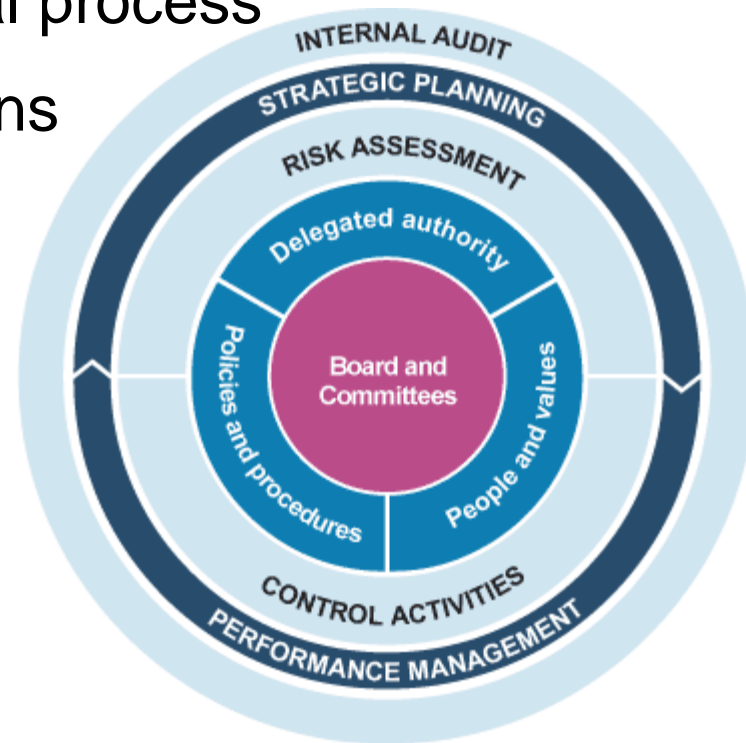
- **Social Checklist**

- ☐ Lifestyle enhancement / degradation
- ☐ Community reaction
- ☐ Archaeological heritage
- ☐ Global network access
- ☐ Local & regional traffic generation
- ☐ Education & research collaboration
- ☐ Culture exposure

Evaluation Criteria

• Governance Checklist

- ❑ Decision-making founded on global best-practice
- ❑ Respect civil society approval process
- ❑ Avoid precluding future options
- ❑ Builds corporate credibility
- ❑ Strategic Plan consistency



“Green Airport” Criteria Example

- **Strategic Objective**

- Limit climate change impact, emissions and noise

- **Operational Principles**

- Reduce operational delays of any kind
- Improve customer service and efficiency
- Re-use, re-invent, and remove waste, like energy

- **Evaluation Criteria**

- Systemic within and beyond airport boundary

“Green Airport” Criteria Example

- **Airfield Operations**

- Reduce aircraft delays and on-time focus
- Reduce approach / runway occupancy time
- Independent parallel runways where necessary
- Rapid exit and entry taxiways
- Holding bays for delayed aircraft
- Surface movement guidance and radar systems
- Taxi-lanes near terminals to reduce vehicle conflict
- Flexible aircraft parking configuration e.g. Multi Aircraft Ramp System (MARS)

“Green Airport” Criteria Example

- **Terminal Operations**

- Efficient Turnarounds through well-organized stands
- Flexible gate and stand configuration
- Reduce Minimum Connect Times (MCT)
- Automate boarding process to improve speed
- Invest in operational systems that reduce emissions
- Incorporate pre-conditioned air under bridges
- Convert to fixed electrical ground power (400-Hz)
- Centralise aircraft waste & FOD disposal facilities

“Green Airport” Criteria Example

- **Landside Operations**

- Improve vehicle flow with design modifications
- Restrict circulation and parking on terminal curbs
- Pursue surface access emissions monitoring
- Use low-carbon content fuels for airport vehicles
- Determine whether pipeline fuel delivery possible
- Establish multi-modal transit use and interchange points to consolidate and promote transit use
- Introduce employee parking charges, or increase to market rates (where effective alternatives exist)

“Green Airport” Criteria Example

- **Energy Use**

- Use local building materials
- Replace outdated equipment and automate controls
- Consider alternate heating and recovery methods
- Invest in utility metering to reduce consumption
- Centralise heating /cooling plants, where feasible
- Adopt modular building solutions
- Introduce “green” building construction strategies

“Green Airport” Criteria Example

- **ESTIDAMA (Arabic for “Sustainability”)**
 - **Estidama Pearl Rating System** is a framework for sustainable design, construction and life-cycle plans
 - Estidama is programme developed by Abu Dhabi Urban Planning Council, conceived to promote new mindset to promote responsible development
 - Intended to create balanced society based on equal pillars: environmental, economic, social and cultural
- **North America - Leadership in Energy & Environmental Design (LEED)**

“Green Airport” Criteria Example

- **Land Use and Facility Development**

- Reduce noise impact through better runway layouts
- Ensure facilities properly sited across sub-systems
- Avoid surface developments that waste land

Abu Dhabi Midfield Terminal Receives Estidama 3 Pearls



Conclusions



Conclusions

- Sustainable development is becoming foundational to establishing a leading Strategic Plan for modern airports
- Environmental management systems provides systemic means of minimising risks and achieving opportunities
- Monitoring and record keeping allows effective evaluation of system performance
- Renewed improvement cycles support wider integration of the environment with airport operations
- Airport leadership to ensure compliance as regulatory demands increasing – act before obligations arrive

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