

Green Airports

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Airport Council International EUROPE

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→ What is a green airport?



The environmental impacts of airport operations

The sources:

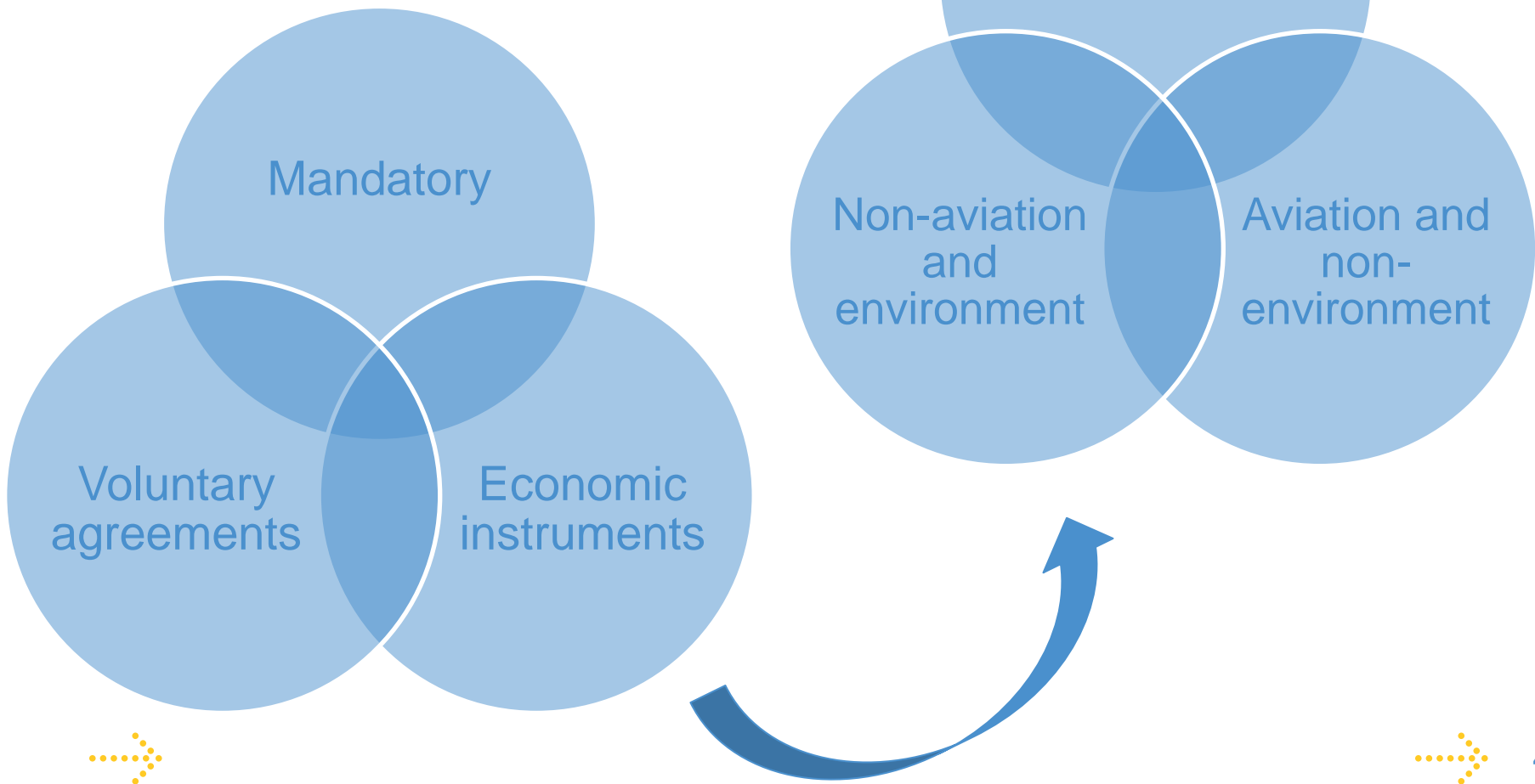
- Aircraft engines
- Ground-handling equipment (tugs, APUs, fuel trucks, pax vehicles)
- Airport own vehicles
- Buildings
- Power plants
- Waste management
- Water management plants
- Surface access

The impacts:

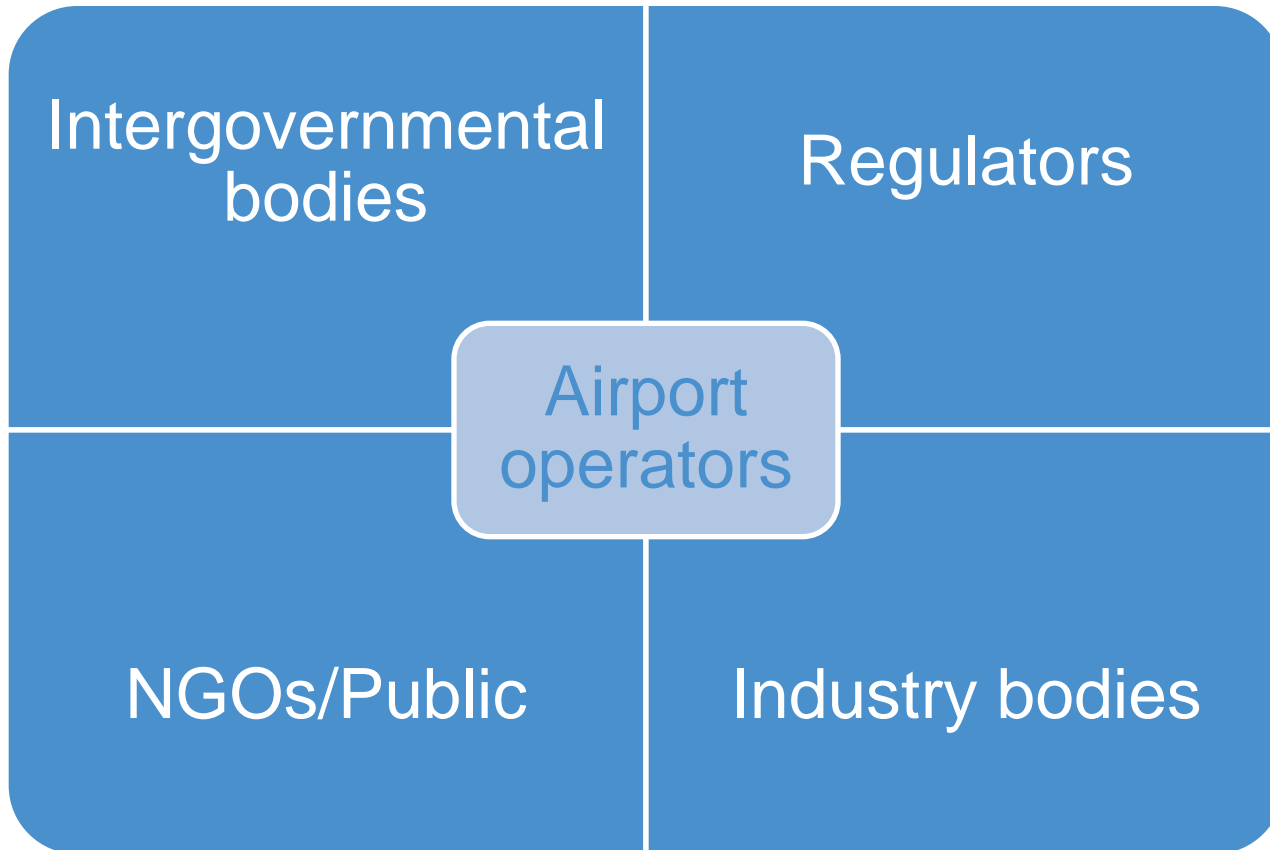
- Carbon emissions
- Air pollutants
- Noise
- Water
- Waste
- Soil
- Fauna and Flora



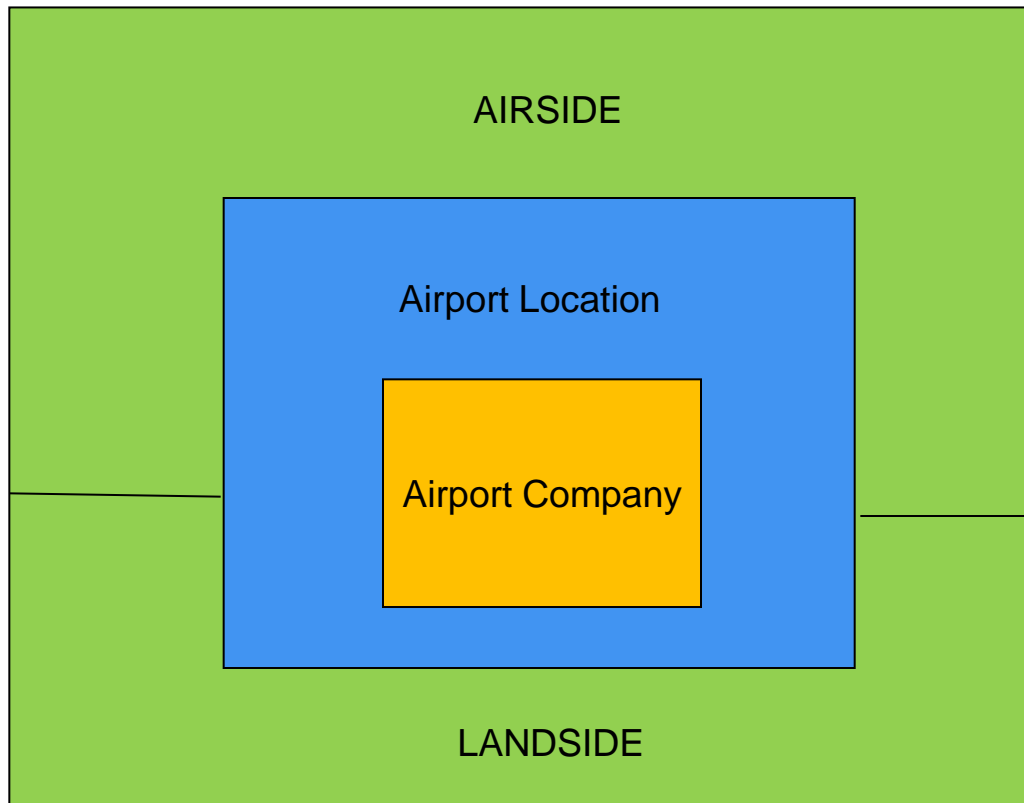
→ A complex framework (I)



→ A complex framework (II)



Moving from regulatory compliance to environmental leadership



CONTROL:

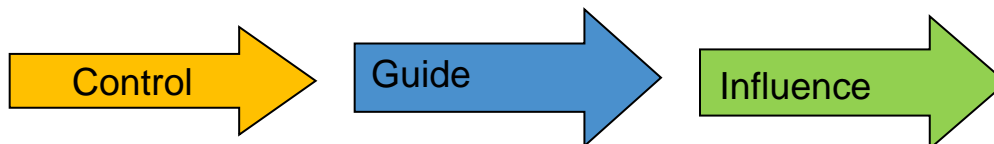
Activities airports are directly responsible for
→ take measures themselves

GUIDE:

Activities which airports do not directly manage
→ steer partners towards joint measures

INFLUENCE:

Activities which airports do not directly manage
→ only an influencing role



Greenhouse Gas Emissions

- Greenhouse Gas Protocol by the WBCSD and the WRI

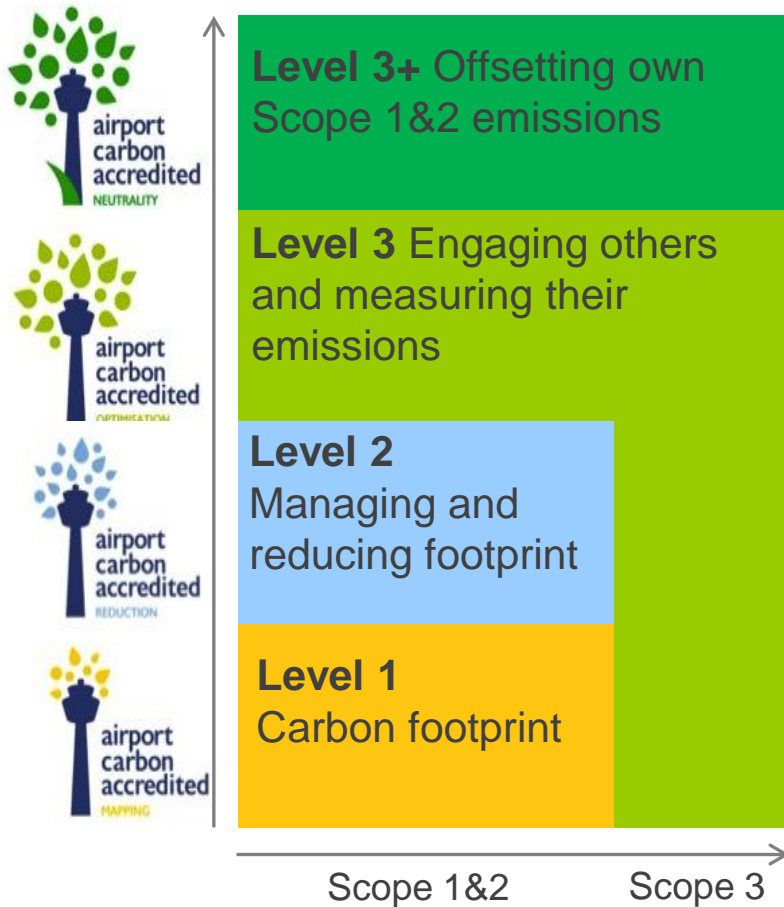
Scope 1 (direct control)	Scope 2 (indirect control)	Scope 3 (guide and influence)
<ul style="list-style-type: none">• Heating and cooling in airport's building• Airport's own fleet• Fire fighting training• Emergency generators• Maintenance	<ul style="list-style-type: none">• Electricity purchased by the airport	<ul style="list-style-type: none">• Aircraft engine (LTO)• APU• Surface Access• GSE• Airside vehicles



Airport Carbon Accreditation, airports' response to climate change



→ Key design elements



- Voluntary programme for active carbon management with measurable goals and reporting.
- Specifically designed for the airport business – site specific but universal to all airports.
- Covers on-site airport operational activities that contribute the most to carbon emissions
- Enables airports to implement best practice carbon management processes and gain public recognition of their achievements
- 4 ascending levels of performance



→ Governance

- **Independent expert Advisory Board**

- Policy direction, approval and advice
- Overall administrative oversight (Administrator, Technical Task Force)
- Monitors and strengthens progress of programme
- Encourages external recognition and endorsement



- **Technical task force of airport environmental managers**

- Continuing relevance of technical standards

- **Owned by ACI EUROPE**

- Public positioning and marketing of programme
- Engages Administrator
- Optimises Institutional approval
- Sets programme fees

- **Independent Administrator – WSP Environmental**

- Applicant registration and processing (entry, renewal and upgrades)
- Formal accreditation approval
- Annual and interim reporting and accounting
- Day to day secretariat and administration
- Programme Help Desk
- Verifier oversight and training



→ External Recognition

Airport Carbon Accreditation is formally supported or endorsed by:

International Civil Aviation Organization



United Nations Environment Programme



European Commission DG MOVE, DG CLIMA



Eurocontrol



European Civil Aviation Conference

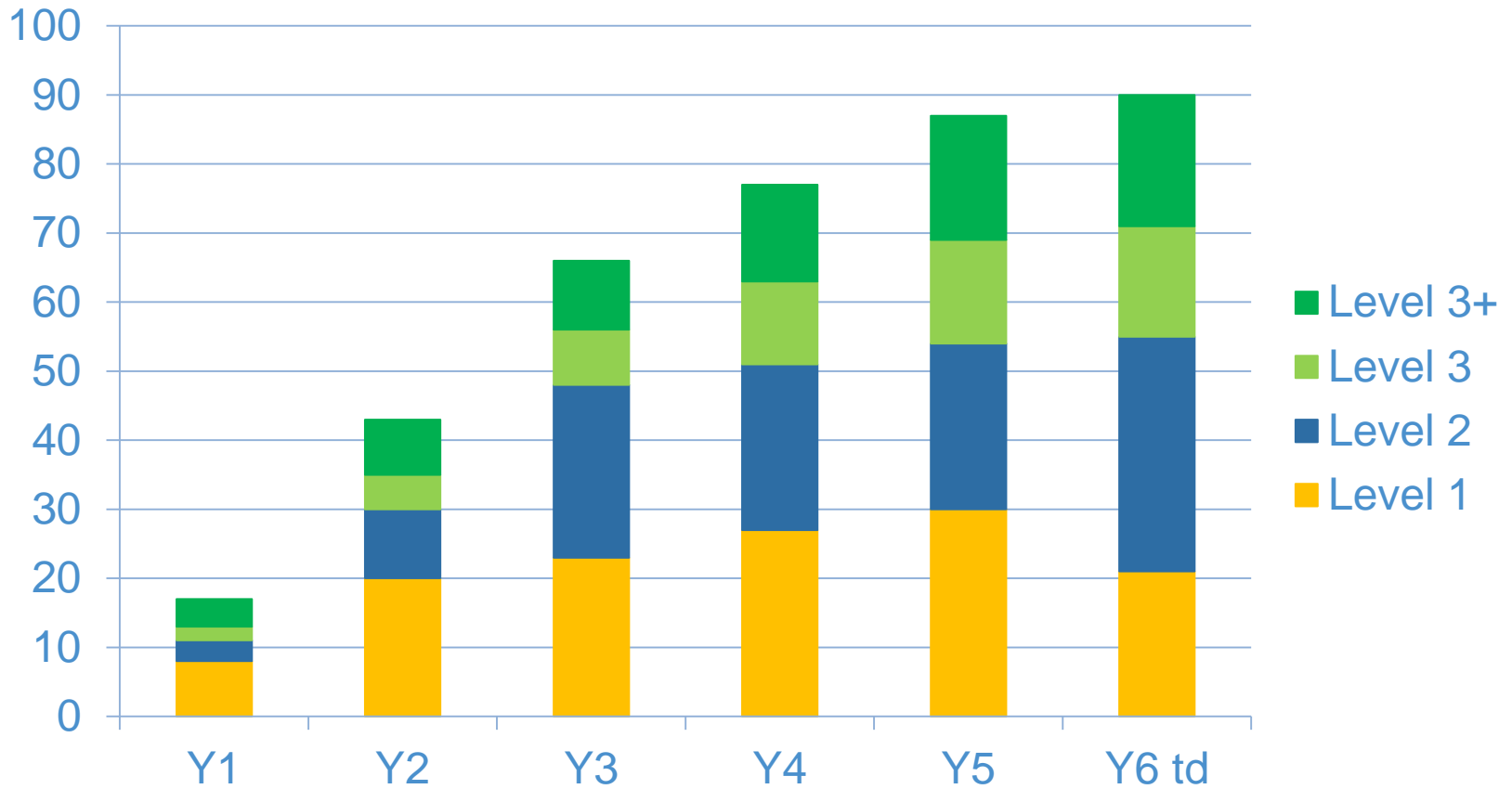


→ Participation to date

World Region	No airports
Europe	90
Asia Pacific	24
North America	6
Africa	1
Latin America	1
Total	122



→ Participation over time - Europe









ACERT

- Carbon footprint calculator
- Developed by ACI World and Transport Canada
- Available free of charge
- Operational inputs (fuel used, electricity purchased, aircraft activity, estimates of ground transport)
- Primarily aimed at airports with limited resources
- Compatible with the footprinting requirements of *Airport Carbon Accreditation*



Airport Carbon and Emissions Reporting Tool ACERT v1.0 (2012)				SEA	2011					
Airport:	Seattle-Tacoma International Airport			Country:	United States			Aircraft mvmts:	314,947	
Report Date:	18/6/2012			Default Ems Factor:	572.9	g CO2/kWh	Passengers:	32,819,796		
Operator:	Ports of Seattle			EF Used:	31.3	g CO2/kWh	Traffic units:	35,142,986		
				Greenhouse Gases (t)						
Entity	Source	Scope	CO ₂	CH ₄	N ₂ O	CO _{2e}	CO _{2e} %			
Airport Operator	Airport Airside Vehicles	1	1,212	0.2468	0.1011	1,249	0.21%			
	Airport Buildings (gas/oil/coal)	1	14,421	0.2571	0.0257	14,435	2.45%			
	Airport Fire Training	1	0	-	-	-	0.00%			
	Airport Emergency Generator	1	16	0.0008	0.0025	17	0.00%			
	Airport Glycol	1	0	-	-	-	0.00%			
	Airport Electricity Purchase	2	4,537	-	-	4,537	0.77%			
	Airport Heat Purchase	2	0	-	-	-	0.00%			
Airport Operator Sub-total						20,238	3.4%			
Tenants (including airlines, government, shops etc.) and Employees	Tenant Aircraft (LTO & taxi)	3	307,489	9.6639	27.8204	316,316	53.69%			
	Tenant Aircraft APU	3	42,149	1.3247	3.8135	43,359	7.36%			
	Tenant Aircraft Engine Run-ups	3	456	0.0144	0.0414	469	0.08%			
	Tenant Aircraft De-icing	3	0	-	-	0	0.00%			
	Tenant Airside Vehicles	3	8,947	1.7332	0.7355	9,211	1.56%			
	Tenant Buildings (gas/oil/coal)	3	2,827	0.0276	0.0314	2,837	0.48%			
	Tenant Electricity Purchase	3	-	-	-	-	0.00%			
	Tenant Heat Purchase	3	-	-	-	-	0.00%			
	Tenant Fire Training	3	48	0.0758	0.3884	170	0.03%			
	Tenant Emergency Generator	3	-	-	-	-	0.00%			
	Tenant Landside Vehicles	3	48,411	17.2212	4.0374	50,024	8.49%			
Airport Employee Vehicles	3	3,142	1.1442	0.2600	3,246	0.55%				
Tenant Sub-total						425,634	72.2%			
Public (including Passengers)	Ground Access Vehicles	Cars, taxi	3	126,643	40.71	10.57	130,776	22.20%		
		Bus, shuttles	3	12,181	1.05	0.99	12,510	2.12%		
		Rail	3	22	-	-	22	0.00%		
Public Sub-total						143,308	24.3%			
TOTAL	Total emissions (tonne)			572,502	73.47	48.82	589,180			
Summary	t CO_{2e}	CO_{2e} %	Total CO_{2e} Emissions (t)			589,180	100%			
Airport Scope 1	15,701	2.66%	The aircraft emissions calculations were			based on detailed aircraft data.				
Airport Scope 2	4,537	0.77%	The landside traffic calculations were			based on estimated traffic data.				
Airport Scope 3	568,942	96.57%	A more detailed separate GHG inventory is also available for Year: 2011							

Benefits of Participation

A. Raised sustainability profile & external credibility

-353.842 tCO₂ in Year 5 in Europe

A. Reduction in exposure to climate change regulatory risks

B. Efficiency improvements

C. Knowledge transfer



→ Concrete measure: aircraft emissions

- An essential enabler: Airport-Collaborative Decision Making
 - > Principle: Enhance the communications flow between the airport, the airlines, the GSE providers and ATC to improve taxiing
 - > Goals:
 - Reduce taxiing time and related fuel consumption
 - Improve the use of airport capacity
 - Eliminate bottlenecks on the ground



→ Concrete measures: aircraft emissions

- Alternative taxiing systems:

- > Not all engine taxiing
- > Taxibot
- > EGTS
- > Wheeltug



- Restrictions on Auxiliary Power Unit usage:

- > Cooperation with GSE providers and airlines is paramount

- Switch from APU to Fixed Electric Ground Power Units (FEGPU) and Pre-Conditioned Air (PCA):

- > Requires airport investments, reflected in the airport charges

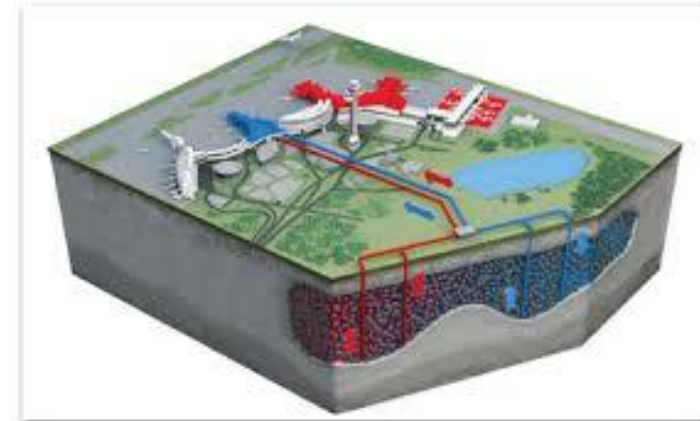
- Biofuels for aviation



→ Concrete measures: airports' own emissions

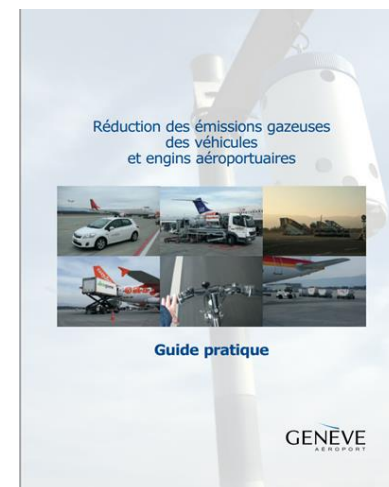
■ Buildings

- > Reduction of energy consumption
 - Retrofitting of LED technology
 - Retrofitting of airport buildings (roof, air-conditioning...)
- > Use of renewable sources of energy
 - Purchase of green electricity
 - Production of energy from renewable sources (solar, Co-generation, aquifer, biomass...)



■ Airports' ground vehicles

- > Fleet replacement programmes
- > Challenges:
 - Economies of scale
 - Reliability under all climatic conditions



Concrete measures: 3rd party emissions

- Surface access (up to 45% of emissions within the LTO cycle)
 - > Asset: airports are intermodal nodes by nature
 - > Cooperation with local/national authorities to develop more environmental-friendly access to the airport
 - > Incentive schemes
 - > Adapting schedule of the public transport services

- Tenants
 - > Information campaigns
 - > The Carbon Challenge
 - Since 2010 at Manchester Airport
 - Identify the top energy-consumers at the airport and exchange best practices on carbon management



➔ Noise management



➔ Noise Management: ICAO Balanced Approach



Reduction of noise at source

Aircraft entering today's fleet are 20 dB than 40 years ago. This represents a subjective noise reduction of 75%.

Adoption of a new ICAO noise standard in 2013: Chapter 14

Land-use planning

ICAO Resolution 35-5 "Not compromised by inappropriate land-use or encroachment"

Local authorities are responsible for delivering building permits.

Operating restrictions

Decision made by national (CAAs) or local authorities

Cost Benefit analysis should take into account economic impacts on airlines and on the region.

Noise abatement procedure

Curved approaches CDO/CCO

Impact assessment on noise and fuel.



Engagement

- Why is it needed?
 - > Regulatory drivers
 - > Role of aviation in society
 - > Demand is growing, so are the benefits and the economic and social impacts
 - > Community tolerance is decreasing
 - > Threat of public and political opposition
 - > Multiple stakeholders: no decision can be made in isolation
 - > Risks of not engaging



→ Engagement

- Who are your stakeholders?

Regulators

- Gvts
- Planing bodies
- CAAs

Internal SKH

- ANSPs
- Airports
- Airlines
- Service partners
- Other

External SKH

- Local communities
- Statutory bodies
- Environment groups
- Interested parties
- Air transport users



Engagement

- Benefits of engagement:
 - > Control the process
 - > Save time and costs
 - > Minimise conflicts
 - > CSR
 - > Mandate to grow

- Benefits of community engagement:
 - > Identify the nature and extent of disturbance
 - > Enable tolerance through:
 - Acknowledging there is a problem
 - Engaging communities in finding a solution
 - Constructive problem-solving
 - Collaborative decision-making process



Engagement: the DialogForum in Vienna

Context:

- > Traditional consultation procedures at Vienna airport with the creation of neighbour councils in 1989.

Mediation process: 2000-2005

- > 50 parties involved
- > 2 main issues:
 - Current measures
 - Expansion plans
- > In 2005 **Mediation contract**
 - Sets up the **DIALOGFORUM** : Lasting communication structure that deals with potential conflicts inherent to the system

Results:

- > Strong involvement of all in a resource-intensive process (e.g. definition of new procedures, new SID, test flights with different turning points, curved approaches)
- > Decrease in noise complaints (20,000 in 2004 – 6,129 in 2013)
- > Publication of environmental data and flight track system
- > Looks into future operations



Engagement: Collaborative Environmental Management (CEM)

- A protocol aimed at supporting cooperation between operational stakeholders at airports.
 - > Local approach
 - > Flexible
 - > Builds on existing arrangements
 - > Launched in November 2014

- **Content:**
 - > Working arrangement between interested parties
 - > An environmental vision for the airport
 - > An action plan to translate the environmental vision into a concrete measures
 - > A forum of operational stakeholders to present their issues

- **Support documents:**
 - > CEM specifications
 - > Check-list of 31 questions



→ Local Air Quality

- Concentration limit values:
 - > Not airport-specific
 - > Airports requested to take measures when threshold is exceeded in the region, not necessarily on the airport site

Gothenburg Protocol (transboundary pollution – in 2001 and reviewed in 2012)

<p style="text-align: center;">NEC Directive</p> <ul style="list-style-type: none"> - Limits in 2010 for SO₂, NO₂, volatile organic compound and NH₃ 	<p style="text-align: center;">Dir on Ambient Air quality and Clean Air for Europe</p> <ul style="list-style-type: none"> - pm 2,5: limit value, exposure concentration and exposure reduction target - pm 10: monitoring - SO₂, NO₂, NO_x, benzene, CO, pm and lead: limit values in ambient air - ozone: target value, long-term obj for the concentration - Volatile organic compound and Nox: monitoring requirements 	<p style="text-align: center;">Directive 2004/107/EC</p> <ul style="list-style-type: none"> - Target values for arsenic, nickel and PAHs - Monitoring for mercury
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→ Local Air quality

- **Methodology:**

- > Air quality is monitored and results are compared with limit values.
- > A detailed inventory and dispersion calculation is conducted to determine the source causing exceedance.

- **Mitigation measures:**

- > Modulation of landing charges
- > Rules on the vehicles allowed on the apron
- > Industry initiatives (“Switch-off your engine”)
- > Rules on APU usage
- > Surface access
- > Any measure related to the reduction of emissions from combustion engines



→ Water Management

- Stormwater management



→ Water Management

- Waste water management



Sanitary waste water from buildings



Waste water from aircraft de-icing



Sanitary waste water from aircraft

→ Water Management

- Waste Water Treatment Plant
 - > Comparable with the waste water of a community of 8.000 inhabitants (excl. de-icingwater)
 - > Investment costs
 - > Maintenance costs





Water Management

- Reduction of water consumption
 - > Installation of waterless urinals
 - > Use of storm water for cooling towers
 - > Use of storm water for sanitary purposes
 - > Use of storm water for fire fighting exercises

- Measures to improve water quality
 - > Waste water treatment plants
 - > Emergency measures in case of oil spill
 - > De-icing stands





Waste Management

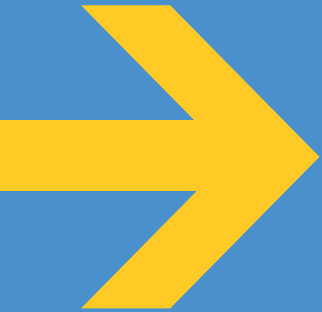


Other impacts

- Fauna and Flora
 - > Wildlife and Habitat
 - > Natura 2000 Directive
 - > Habitat Directive

- Soil





THANK YOU

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www.airportcarbonaccreditation.org

