Airports and the Environment. How to balance economic and environmental concerns.

A concept for the second GARS book
on aviation and the environment

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Airports and the environment:

- Strong long term growth for air transport
- Infrastructure is the bottleneck with persistent excess demand and inefficient rationing.
- Environmental problems with using and extending capacity.
- How well are environmental problems at airports managed ?

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Mott Mac Donald & EU Commission (2006)

- Effects of secondary trading: Substitution
  - of general aviation by commercial flights
  - of charter and cargo by scheduled flight
  - of small by larger aircraft
  - of short by long haul flights
- Quantitative effects:
  - 7,2 % more passengers and 17.1 % more revenue passenger kilometers and 51.6 Mio more passengers in 2025.
  - Consumer surplus: + € 31bn at current rates in 2025
  - Producer surplus: + € 1.2 bn in 2025 (upper bound)

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	Demand/ Supply	Capacity limit dictated by:				
Airport	Capacity	Noise	ATC	Runway	Apron	Terminal
ARN	ES	x				
FAO	ES				x	
AMS	Peak	x	x	x		
BRU	Peak		x			
CDG	Peak	x	x			
FCO	Peak		x	x	x	
LIS	Peak			x	x	x
MUC	Peak	x				
PMI	Peak					x
VIE	Peak			x		
DUS	ED	x				
FRA	ED			x		
LHR	ED		x	x	x	
ORY	ED	x				
Absolute		6	5	6	4	2
Relative		43%	36,00%	43%	29,00%	14,00%

Sources: NERA (2004) IATA (2003)

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Airport	Night curfew	Noise Budget	Noise Charges	Emission charges
ARN	No	No	No	No
FAO	No	No	No	No
AMS	Yes	Yes	Yes	No
BRU	Yes	Yes	Yes	No
CDG	Yes	No	Yes	No
FCO	Yes	No	Yes	No
LIS	Yes	No	No	No
MUC	Yes	No	Yes	Yes
PMI	Yes	No	No	No
VIE	Yes	No	Yes	No
DUS	Yes	No	Yes	No
FRA	Yes	No	Yes	Yes
LHR	Yes	No	Yes	Yes
ORY	Yes	No	Yes	No
Absolute	12	2	10	3
Relative	75,00%	14,00%	71,00%	21,00%

Source: Boeing (2008)

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Passenger Tax

Country	$ per pax	Differentiation	Rationale	Established/ Reformed
Austria	6 to 11	only international		
Belgium	no		Environment	withdrawn proposal in 11/2008
Denmark	no		Environment	withdrawn in 2007
Finnland	6 to 12	domestic; international		
France	1 to 40	distance and type of ticket	UNITAID against diseases	created in 2006
Ireland	2,5 to 25	length	Environment	introduced in 3/2009
Italy	7 to 11			
Malta	no			rescinded in 2008
Nether-lands	11 to 45	distance	Environment	01.07.2008
Spain	4 to 8	domestic; international		
UK	15 to 120	distance and type of ticket	Environment	reformed in 2007

Sources: Keen, Strand (2007), Government websites

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Preliminary conclusions

- Capacity and environmental problems are closely linked.
- Environmental capacity is most likely not efficiently managed at European airports.
  - Command and control instruments with doubtful efficiency characteristics
  - Ineffective pricing of noise and other externalities.
  - Symbolic environmental policy and other motives (budget problems) might be dominant
- Capacity and environmental problems are distorting relative prices and traffic flows making the decision on timing and scale of capacity enhancements difficult.
- Mismanagement of environmental problem might lead to blockade of welfare enhancing capacity extensions. Slot values rarely reflect potential large welfare losses.
- In short, market failure and government failure with substantial welfare losses

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Research Agenda: Three broad approaches

- Standard welfare economics
  - Describe and analyse current instruments.
  - Evaluation of in terms of cost and allocative efficiency
- Ecological economics.
  - Sustainability of environmental management
- Political Economy
  - Stakeholders and interest groups. Strategies of airports, airlines, neighbours and environmental groups
  - Institutional setting of regulation. Regulatory capture and policy failure

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Topics:

1. Trends of noise and other emissions at airports

- How have the noise levels at airports developed? Will they rise in the future? Will new aircraft reduce noise emissions substantially? Are there limits of technical noise reductions reached?
- How important are other emissions of aircraft at airports?
- How will the trade off between noise and NO_x effect noise and other emissions at airports?
- How do ATC problems affect environmental capacity?
- How have congestion, noise and air pollution generated from access modes developed?

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2. Valuation of noise and local emissions at airports

- How to measure noise and other emissions? How exact are the measurements? How do they estimate noise at night times?
- How to estimate marginal costs of noise and other local externalities? What are the results of studies at airports? Can we generalize from the few studies?
- How to use marginal costs studies for airport policy? Are they useful for noise differentiation?
- Are noise and other environmental targets set at an efficient or sustainable level?
- How to define the notions of "environmental capacity" and "sustainability of airports"?

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3. Objectives & instruments of environmental management

- Rationale of environmental objectives.
  - Are goals (over all noise and emission levels, night times noise levels) set at the right level? Do they maximize welfare? Are they sustainable?
- Command and control measures.
  - Night bans and restrictions of noisy aircrafts. How effective and how efficient?
- Environmental reporting.
  - Does certification improve environmental performance?
- Noise protection programs.
  - Why have many airports financed additional programs?
- Land use planning.
  - Evaluation and comparison of different systems in Europe.

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3. Objectives & instruments of environmental management (II)

- Noise charges.
  - How are noise charges differentiated for example between loud and less noisy aircrafts, between day and time? How efficient is the structure and the level? Are noise charges symbolic or do they effect fleet structure and noise levels?
- Emission charges.
  - Are they targeting global or local externalities? Are they symbolic or enforcing ineffective noise charges or efficient?
- Noise and emission budgets and tradable permits
  - Assessment in terms of efficiency and practicability
- Effects of efficient pricing
  - How elastic are noise and emission levels? Does the pricing of local externalities change traffic distributions?
- How to internalize heterogeneous externalities? How to develop efficient mixed strategies of prices and quantities ?

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4. Case studies on airports and institutions

- Evaluation of environmental management of
  - capacity restrained airports like AMS, ADP, LHR
  - innercity airports like DUS, HAM, London City
  - LCC airports like Lübeck, Stansted
  - airports in the new member states
  - airports which have increased capacity like Madrid or are planning to increase capacity like FRA.
- Neighborhood and environmental groups. What measures do they favor? How powerful are they? Public good character.
- Airport as a good neighbor. Environmental ethics and management style.

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5. Environment and planning of airports

- Environmental valuation in planning processes of airport extensions.
- The role of cost benefit studies.
- The role of regional impact studies in environmental assessments
- Land use planning as an instrument to avoid environmental conflicts.
- Legal rights of neighbors. Do environmental groups influence length and outcomes of planning and permission process ?

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6. Policy (I)

- Evaluation of environmental policy of EU-Com.
  - Efficient, effective or symbolic?
  - The role of pressure groups.
- Evaluation and comparison of environmental policy of different EU member states.
  - Efficient, effective or symbolic?
  - The role of pressure groups.
- Comparison of institutional setting.
  - Who is regulating the environment? Local, regional or federal government.
  - Direct or indirect regulation. Are noise charges set by the regulator or by the airport?
  - Independent or dependent regulator. Which is the better model?
  - Separation or integration of economic and environmental regulation

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6. Policy (II)

- Governance structure and environmental policy
  - How does governance structure affect how and whether externalities are internalized (in whole or in part) and does governance structure affect the choice of instrument?
  - What role does the type of regulation play in effecting externality internalization and is one type of regulation favoured?
  - How does the inefficient use of capacity effect the environmental performance? How could policy be improved?
- Coordination of environmental policy.
  - The pro and cons of common noise and emission standards.
  - How to manage regional spill over's of externalities? Case studies on Zürich and other airports.

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