ACTION PLAN – SUMMARY

AREA	*OBJECTIVES/TARGETS/ACTIONS*	*TARGET DATES*
I. IMPROVING TECHNICAL STANDARDS AND RELATED RULES		
1. Noise	More stringent international standards and rules for transition	By 2001 (33rd ICAO Assembly)
2. Gaseous Emissions		
NOX	More stringent international rules	By 2001 (33rd ICAO Assembly)
CO2 and other greenhouse gases	Reductions according to the targets of the Kyoto protocol.	2001 for review and update (33rd ICAO Assembly)
LTO emissions	Provide proposal for an equivalent charge	By 2001 (33rd ICAO Assembly)
Emission methodologies	To be improved, in co-operation with SBSSTA and CAEP	By 2001 (33rd ICAO Assembly)
3. Operational Measures		
Air Traffic Management	Improve ATM efficiency	Communication end 1999
II. STRENGTHENING MARKET INCENTIVES		
1. Economic Incentives		
Aviation charges	Proposal for an aviation charge	By early 2001 (after CAEP 5)
Emission trading	Explore benefits/risks	By 2001
Carbon offsets	Explore benefits/risks	By 2001
2. Encouraging Industry Initiatives		
EMAS	Encourage airports/airlines to register under the new EMAS regulation (upcoming)	New EMAS regulation (mid 2000)
Voluntary agreements	Suggest voluntary agreements on emission reductions.	Early 2000 launch of substantive discussions

III. ASSISTING AIRPORTS		
1. A Common Noise Classification Scheme	Proposal for a Community framework on noise classification	By 2000
2. A Framework for Noise Measurement	Proposal for a common noise measurement index, a methodology for noise calculation and minimum requirements for noise monitoring	By 2001
A Framework for Land-use Rules	Guidance on best practices for land-use decisions	By 2001 (Report)
3. A Community Framework for Operating Rules	Framework fo procedural rules , best practices dissemination	By 2001 (Report)
4. Introducing More Stringent Noise Rules at Individual Airports	Analyse appropriateness of a Community system for identifying noise-sensitive airports	By 2001 (Report)
5. The role of other modes	Working towards for more effective air/rail intermodality	Ongoing
R&D	**IV- ADVANCING TECHNOLOGICAL IMPROVEMENT (R&D)**	Ongoing (5^{th} and 6^{th} R&D framework programme)
Monitoring	Develop inventories of statistics and indicators through the Transport and Environment Review Mechanism (TERM) process.	TERM-Zero report to be published in early 2000, review by 2002

ANNEX 1

EU Passenger Transport Performance
Main Modes of Transport

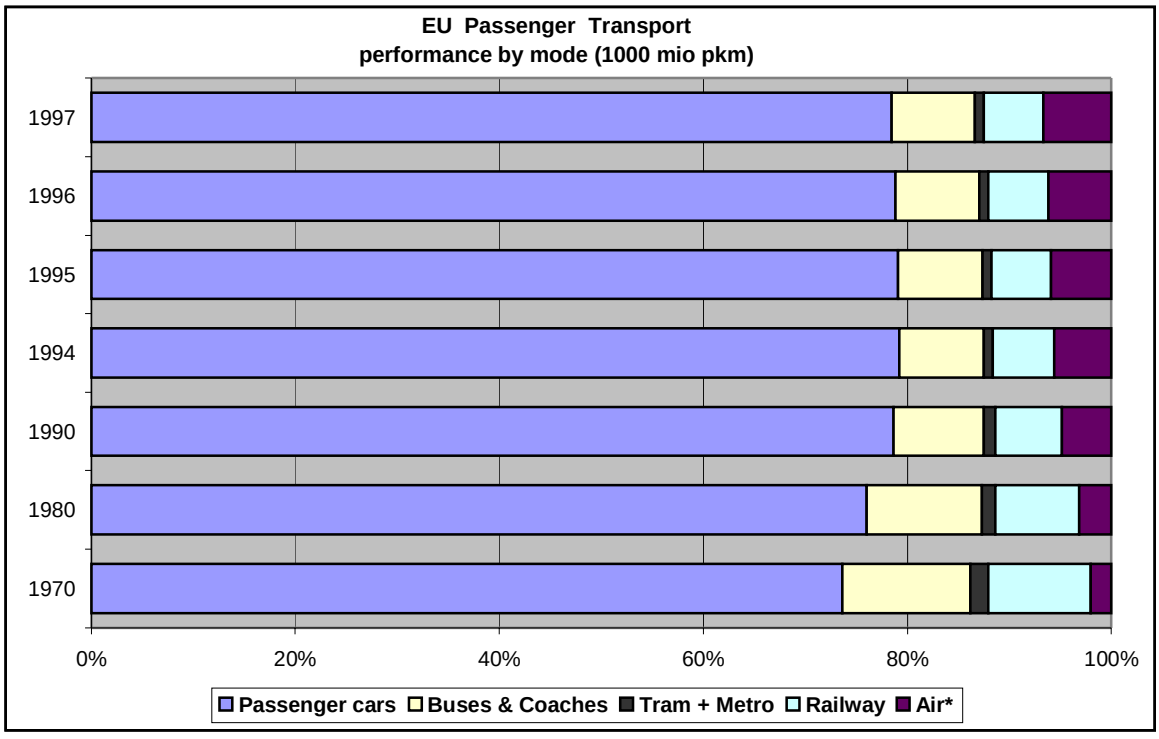
Figure 1: Performance by mode
1000 mio pkm

	Passenger cars	Buses & Coaches	Tram + Metro	Railway	Air*	Total
1970	1 583	270	38	217	*43*	2 151
1980	2 333	347	40	253	*96*	3 069
1990	3 302	369	48	274	*204*	4 197
1994	3 584	374	41	270	*254*	4 523
1995	3 656	384	41	270	*274*	4 624
1996	3 710	386	41	279	*290*	4 707
1997	3 787	393	41	282	*322*	4 826
1990-97	+ 15 %	+ 6 %	- 13 %	+ 3 %	+ 58 %	+ 15 %

Source : ECMT, UIC, UITP, national statistics and estimates

Notes : * European traffic, Source : AEA, IATA and estimates

Worldwide traffic of EU carriers was 550 bio pkm in 1995



Source: EU TRANSPORT IN FIGURES, STATISTICAL POCKETBOOK, DG TRANS, EUROSTAT

MARKET DEVELOPMENT – SUPPLY

Figure 2: Growth and Forecast in Scheduled Air Traffic Capacity

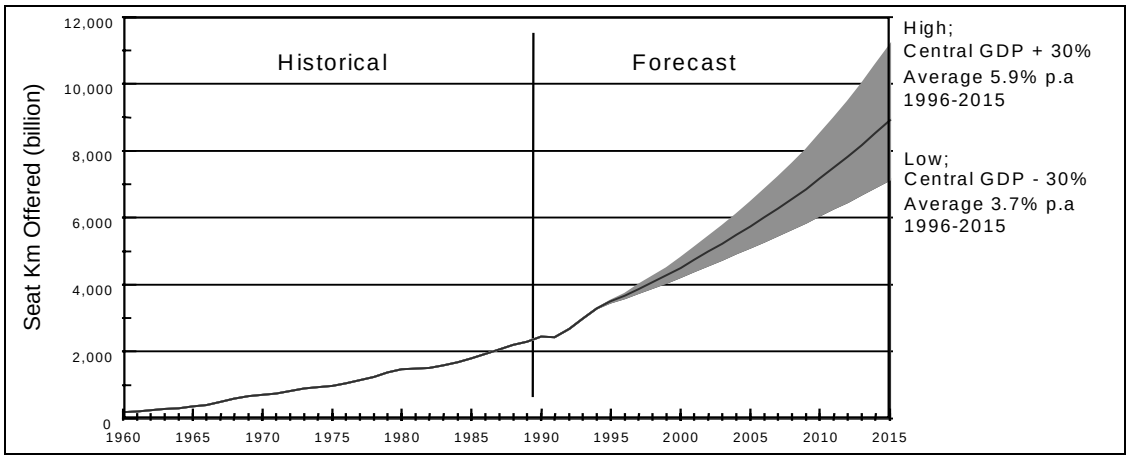
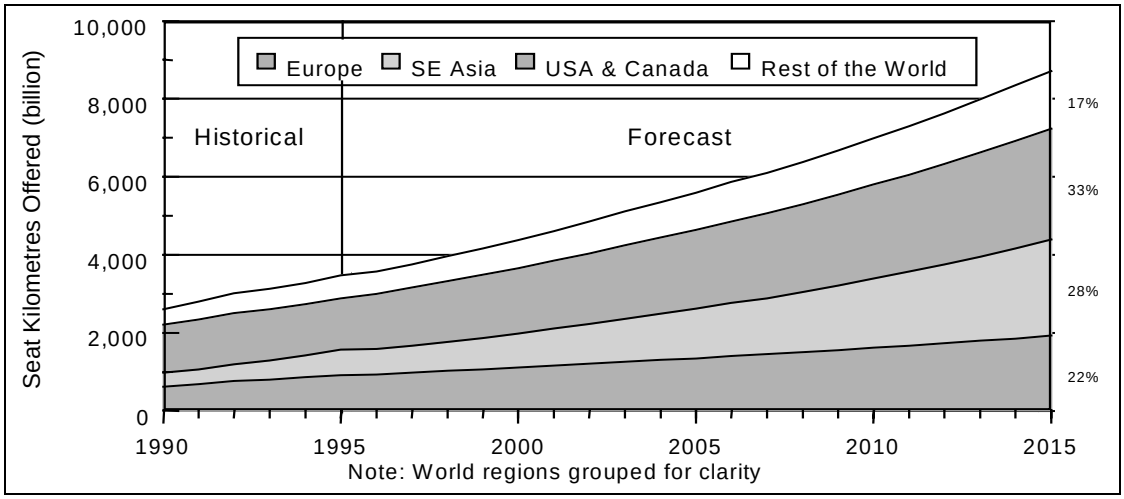
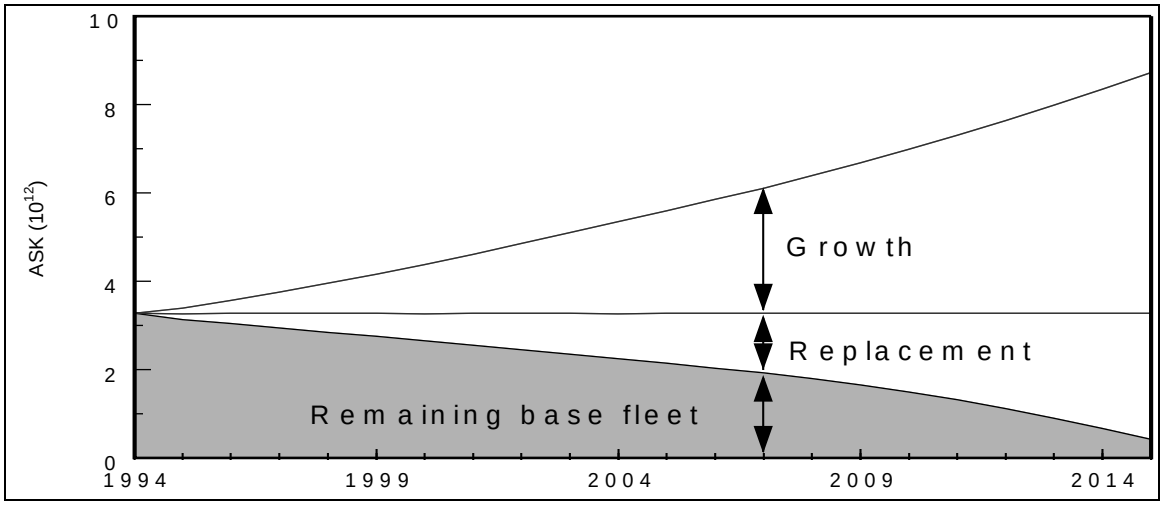


Figure 3: Capacity Forecast by Geographical Region



Source: ECAC/ANCAT (Expert group on Abatement of Noise Caused by Air Transportation)

Figure 4: Capacity Trend

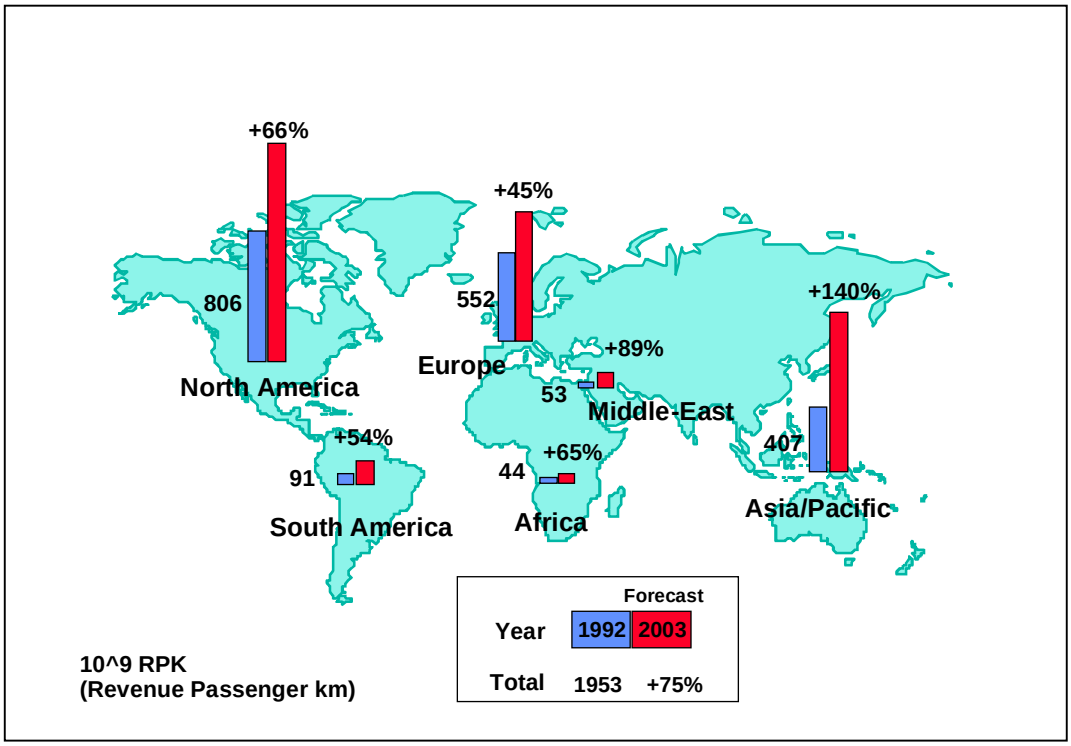


ASK: Available Seat Kilometres

Source: ECAC/ANCAT (Expert group on Abatement of Noise Caused by Air Transportation)

MARKET DEVELOPMENT - DEMAND

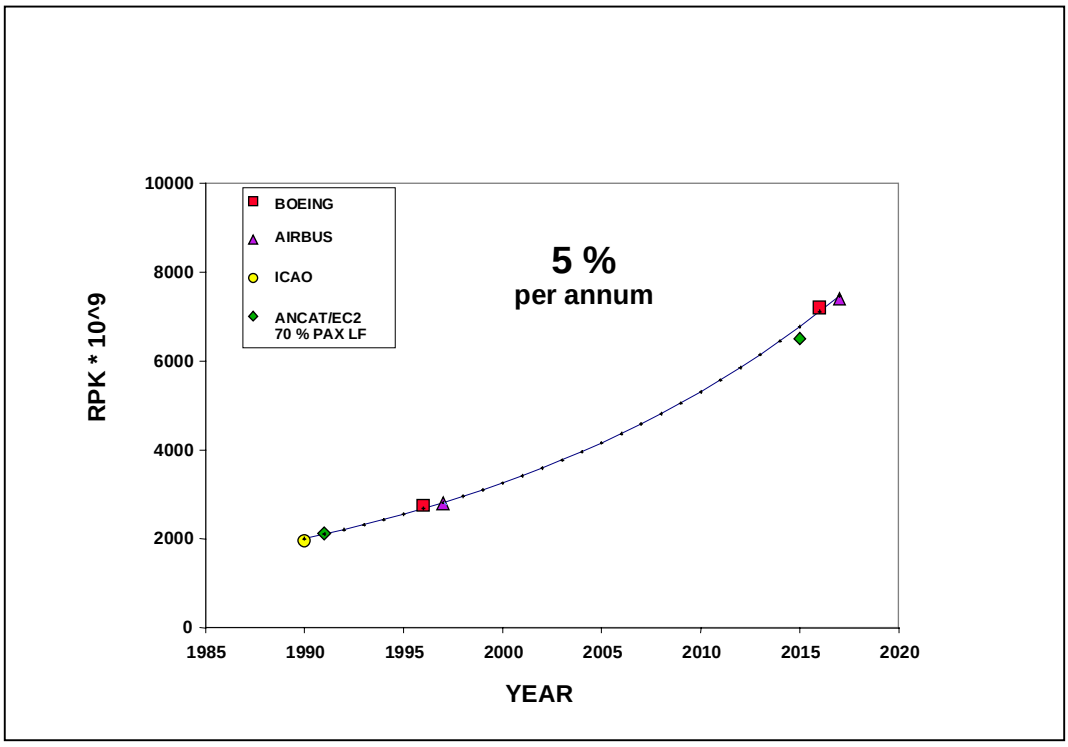
Figure 5: Growth Situation of Aviation



Source: DLR (Deutsches Zentrum fur Luft- und Raumfahrt)

Figure 6: Forecast of Passenger Demand in Aviation

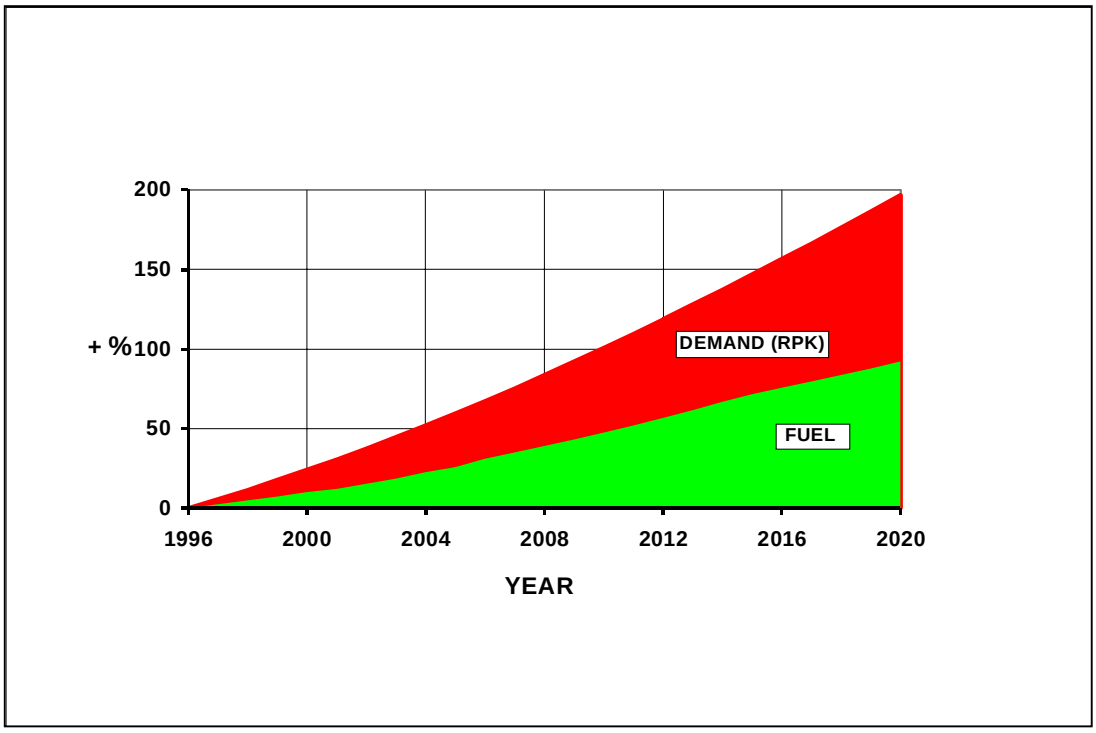
(10^9 Revenue Passenger Kilometre)



Source DLR (Deutsches Zentrum fur Luft- und Raumfahrt)

FUEL CONSUMPTION AND CONSUMPTION EFFICIENCY

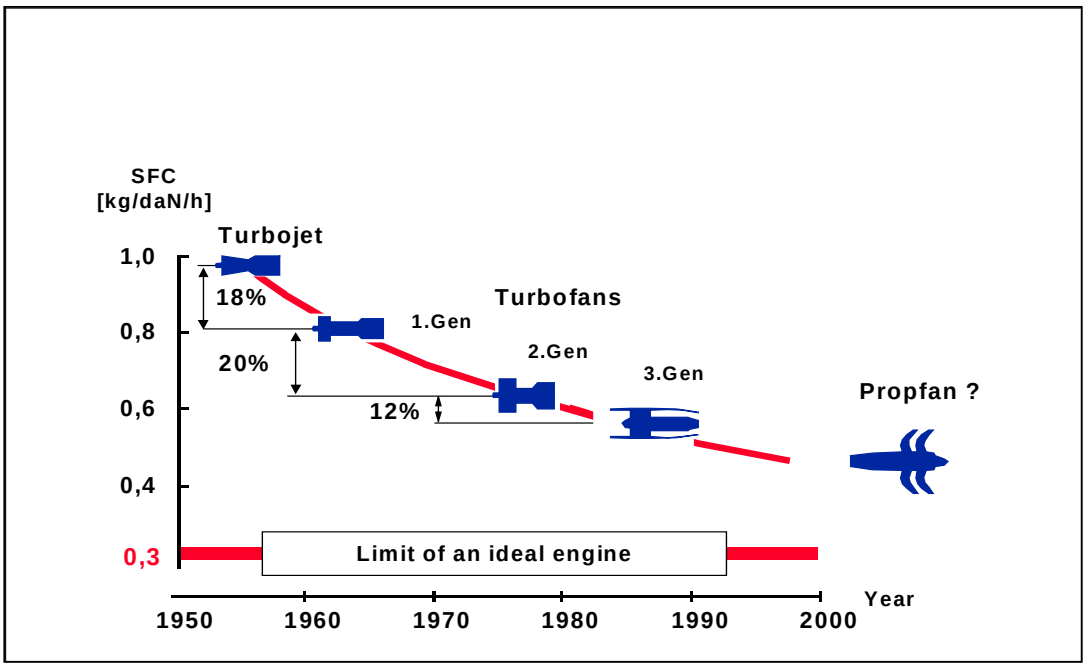
Figure 7: Growth of Air Traffic and Fuel Consumption



RPK= Revenue Passenger Kilometres

Source: Assessment using Boeing Market Outlook

Figure 8: Engine Technology Steps and Gain of SFC

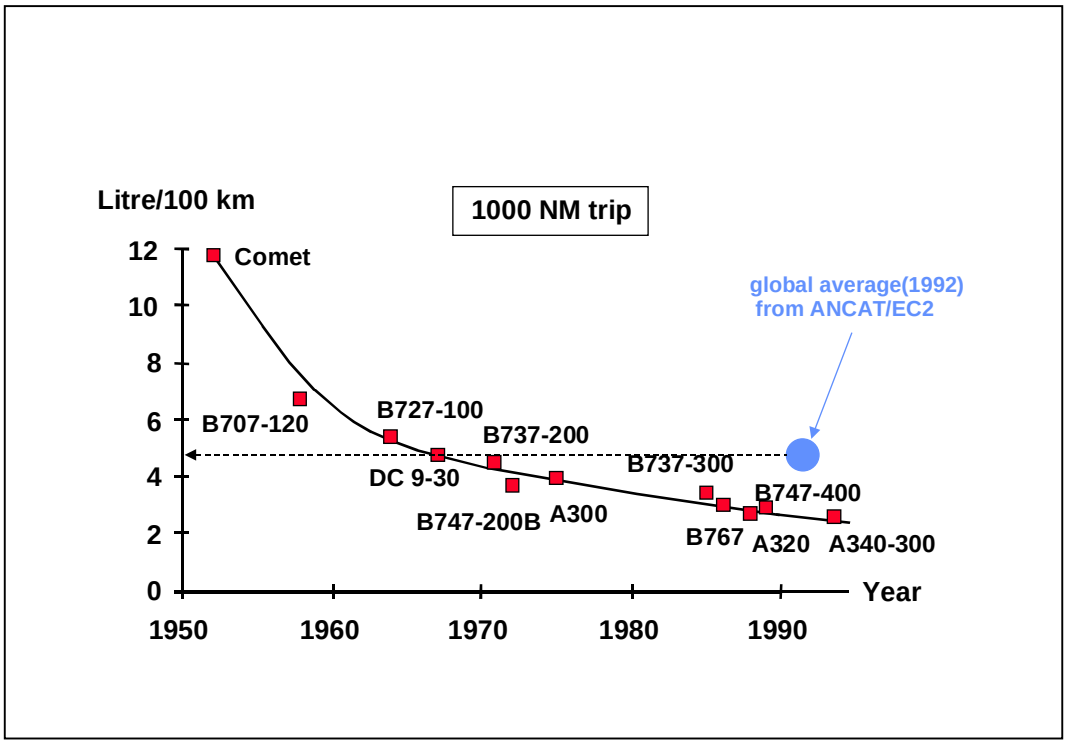


(Specific Fuel Consumption) at cruise conditions

Source: MTU/DLR

Note: Specific Fuel Consumption means the amount of fuel weight flow to an engine's combustor in kg per hour (kg/h) divided by the amount of thrust produced by the engine in dekanewton (daN=10 N)

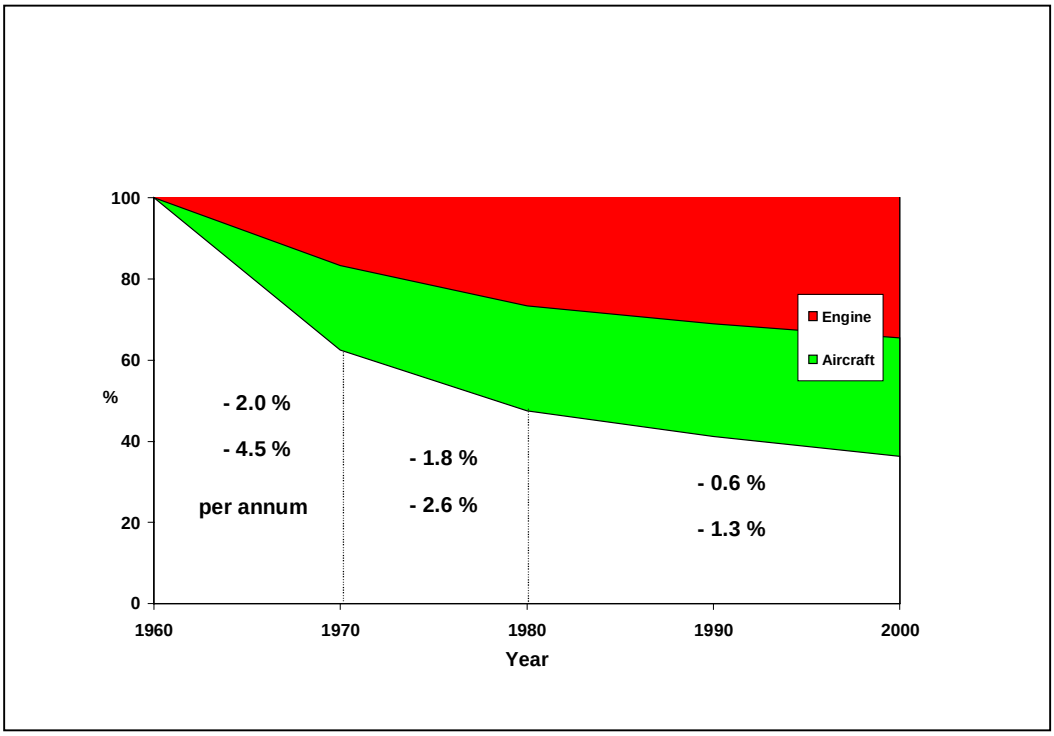
Figure 9: Development of Aircraft Fuel Consumption per 100 Available Seat Kilometres (ASK)



Source: DLR (Deutsches Zentrum fur Luft- und Raumfahrt)

Figure 10: Aircraft and Engine Fuel Efficiency Improvement

(Long range transport)



Source: DLR

Base: B707

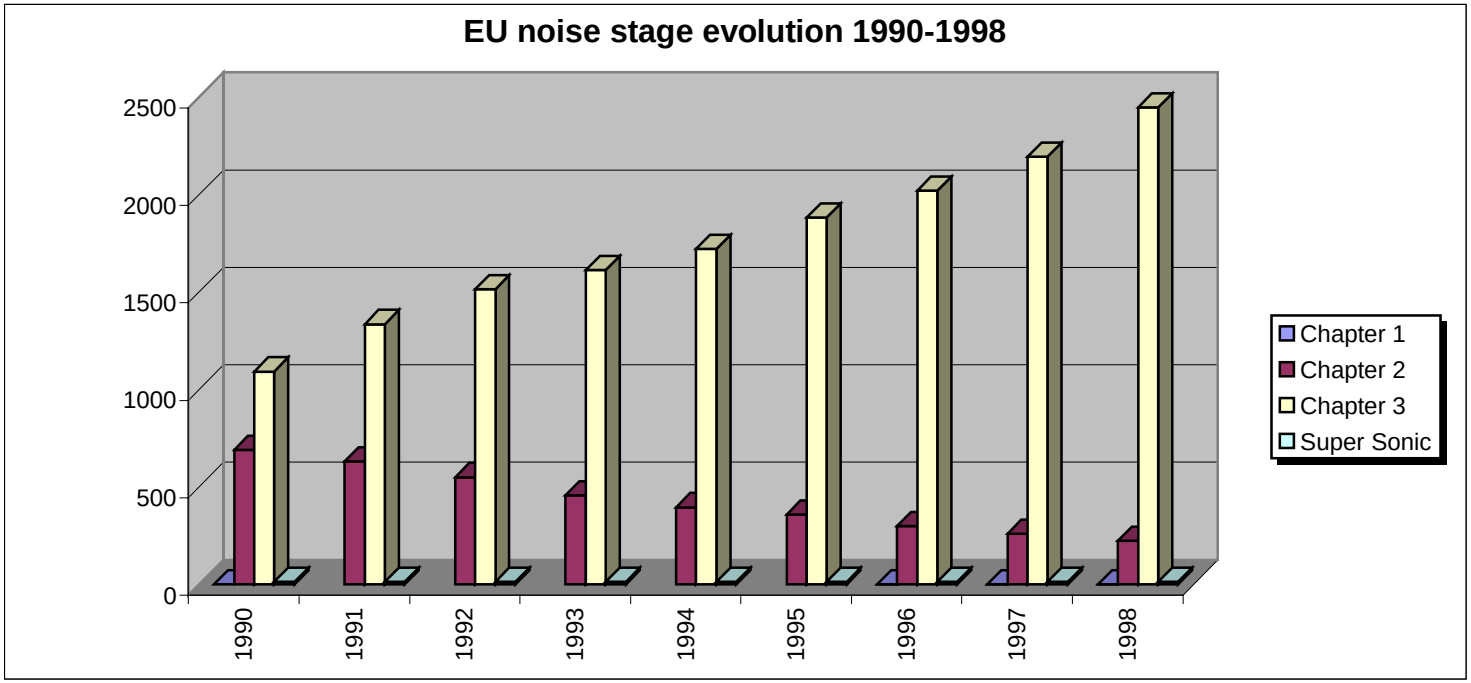
Figure 11 : Number of commercial aircraft by Noise certification operated in EU

ICAO noise classifications:

Chapter 1: aircraft types certified before 1970 (e.g. Boeing 707)
Chapter 2: aircraft types certified between 1970 and 1978 (e.g. Boeing 747-200)
Chapter 3: aircraft types certified after 1978 (e.g. Airbus A310)
SS - Super Sonic (Concorde)

Stage	1990	1991	1992	1993	1994	1995	1996	1997	1998
Chapter 1	1						2	2	2
Chapter 2	690	632	551	457	397	358	299	260	224
Chapter 3	1093	1336	1515	1613	1723	1883	2022	2195	2448
Super Sonic	14	14	14	14	14	13	13	13	13
Total	1798	1982	2080	2084	2134	2254	2336	2470	2687

(source: Airclaims)



Fuel burned, Nox and CO_2 forecast 1991/2 and 2015

	EU 1992	EU2015	USA 1992	USA 2015	World 1992	World 2015
Fuel (Tg)	15,5	29,5	29,9	51,4	107,4	226,5
Nox* (as Gg NO_2)	177	331,5	327,3	557,7	1317,8	2678,8
CO_2 (Tg)	49,3	94,3	95,5	164	342,9	723,4

Source : ANCAT / ECAC

Tg (teragram) = 10^{12} grams
Gg (gigagram) = 10^9 grams
* as Gg NO_2
Notes:

Notes:
The data excludes the following:
1. Dedicated freight traffic
2. Business jet traffic
3. Military traffic
4. General aviation and helicopters
5. Carriers from the former Soviet Union and Eastern European states

Figure 12: Fuel and NOx forecast for 1992 and 2015

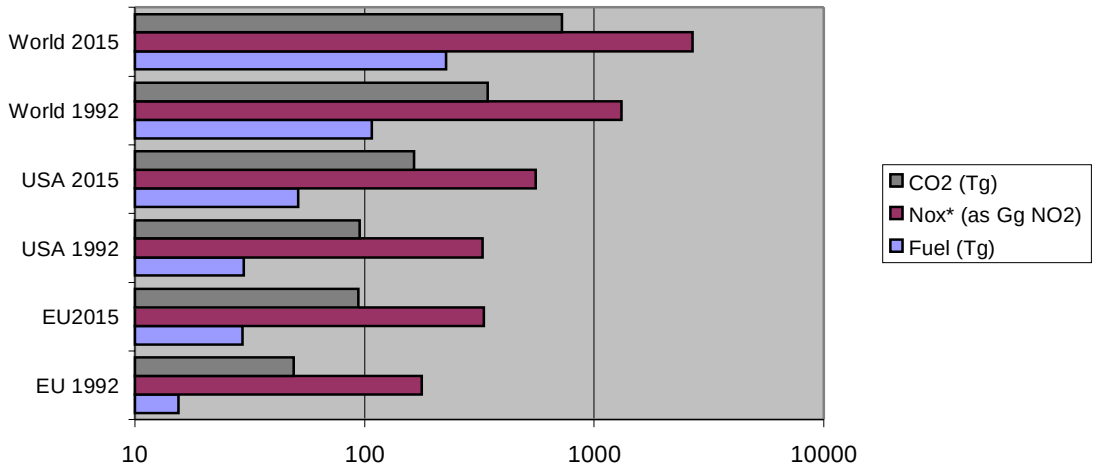


Figure 13: Annual emissions of NO_x (Gg NO_2) from civil aviation and percentage of global totals 1991/92

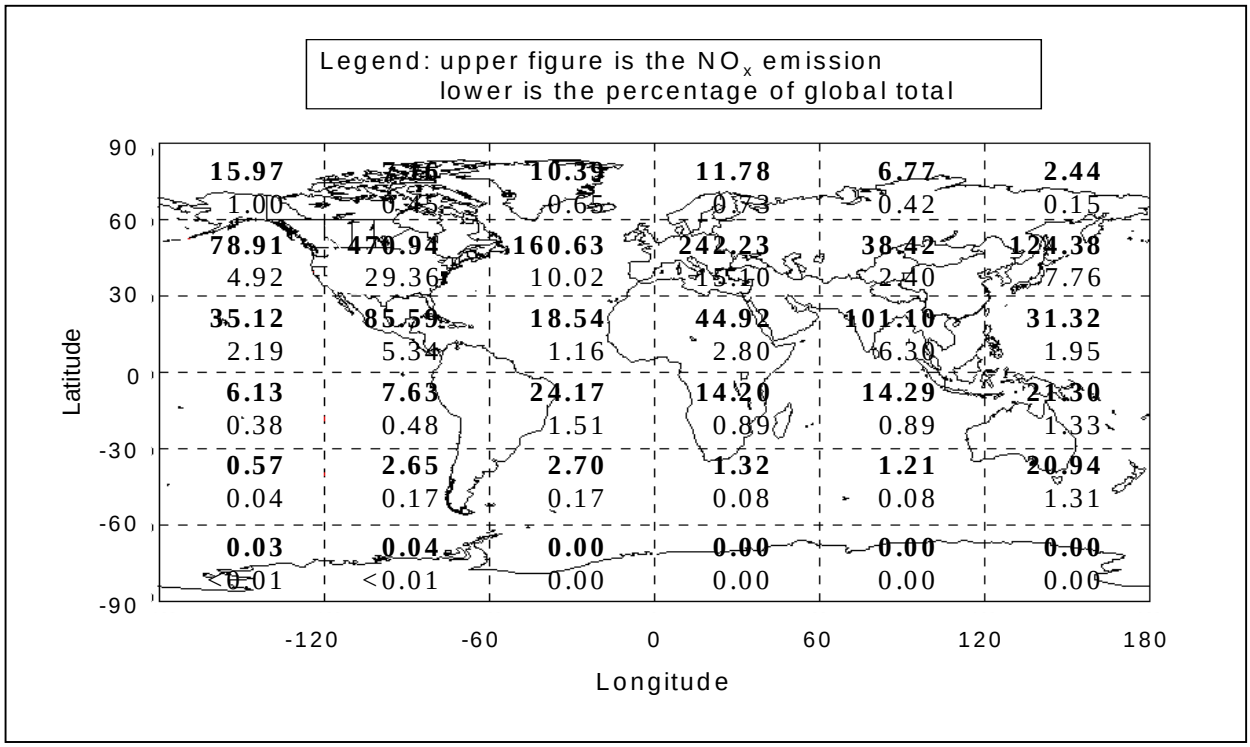
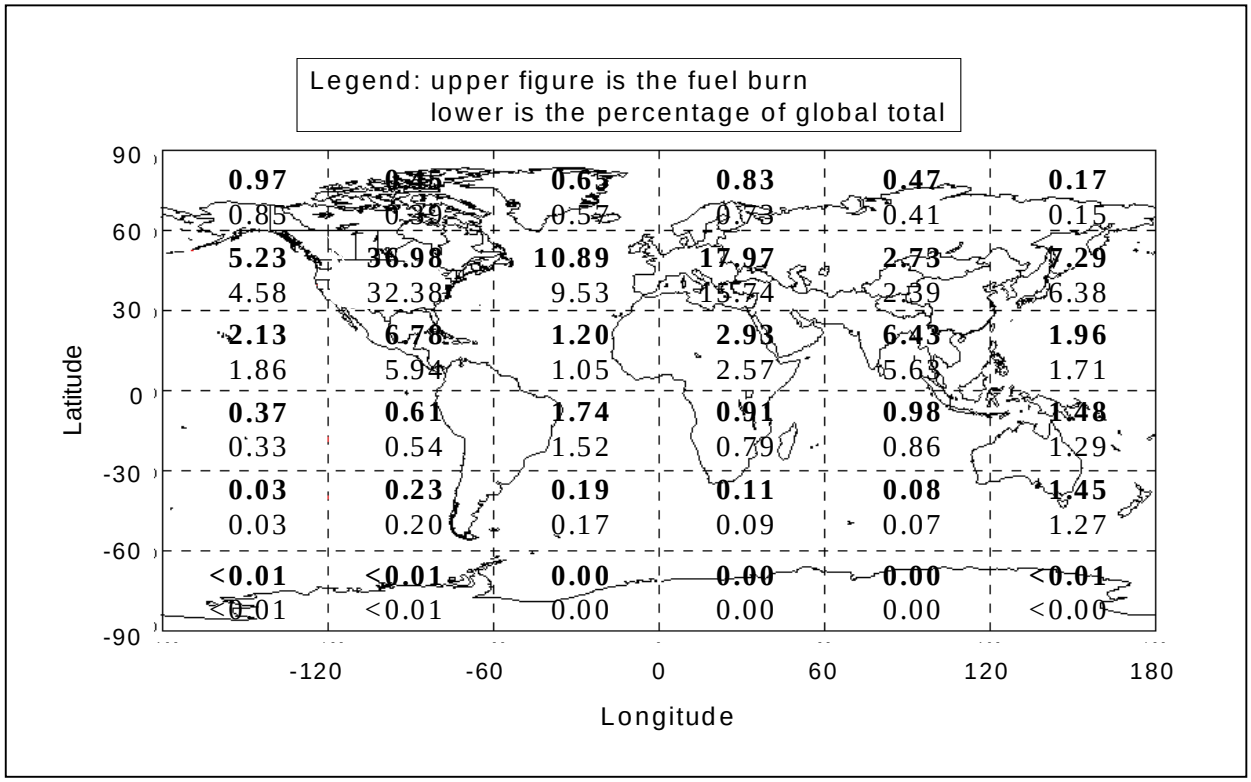


Figure 14: Annual consumption of fuel (Tg) from civil aviation and percentage of global totals, 1991/92



source : ANCAT/ECAC