Performance Review Unit

Realizing Value from Performance Analysis

Asilomar, 16 April 2009

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Structure of Presentation

Current approach to performance in Europe

- **Performance Review System (1998)**
- **Single European Sky I (2004)**

New approach to ANS performance

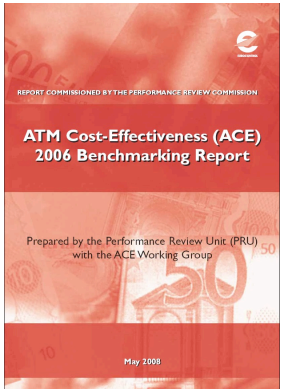
- **Single European Sky II (2009)**

Conclusions

Current approach to Performance (1998-2008)

- **ECAC Institutional Strategy (1997)**
  - **Policy target**: European ANS (~36 ANSPs) to be as efficient as if one system
  - **Independent Performance Review Commission**
    - 12 independent PRC members
    - Supported by Performance Review Unit (PRU)
    - Role
      - Monitor & Analyse ATM Performance
      - Propose European targets
      - Guidelines for economic regulation
    - Products
      - Performance Review Reports
      - ANSP benchmarking (ACE reports)
      - Special reports
        - US-Europe comparison…
  - **Implementation coordination**
    - through EUROCONTROL (CIP, etc)
- **SES I (2004)**
  - ANSP designated at State's discretion, certified, etc

Available on the web



www.eurocontrol.int/prc

KPAs

- **Safety**
  - Regulatory requirements (mandatory)
  - No compromise with other KPAs
- **Efficiency**
  - Cost-effectiveness (user charges ~€8 B)
  - ATFM delays (~€1.5B)
  - Flight-inefficiency (~€3B)
  - All paid by users: Minimise total user cost!
- **Environment**
  - Emissions directly linked with flight-inefficiency
  - Noise addressed locally

ANS Safety

Regulatory requirements

(ICAO, EU…)

- **SMS, reporting, etc**
- **Safety oversight**
  - ICAO audits

Performance targets

Maturity target (processes)

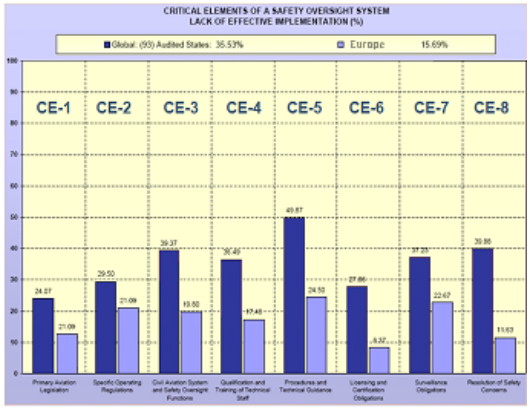
Outcome

- **Accidents**
  - 2-4% ATM related
  - Too few to measure
- **Incidents**
  - e.g. losses of separation
  - Targets in some States
  - No European target yet

Performance management

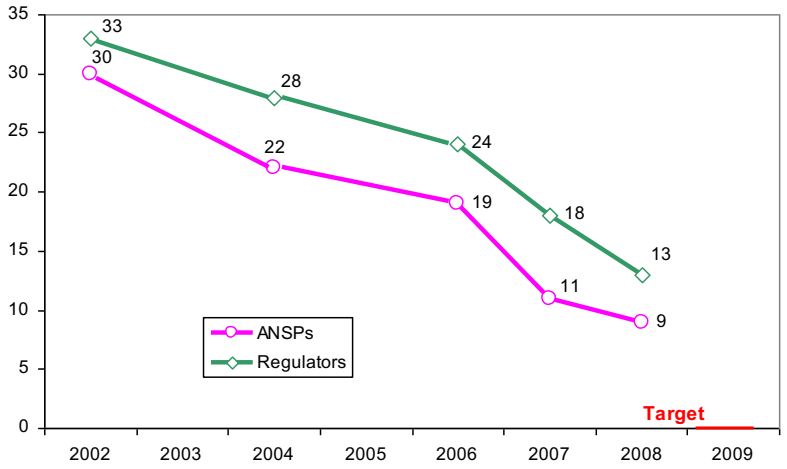
- **At State level, coordinated by EUROCONTR0L**

Safety oversight (ICAO USOAP)

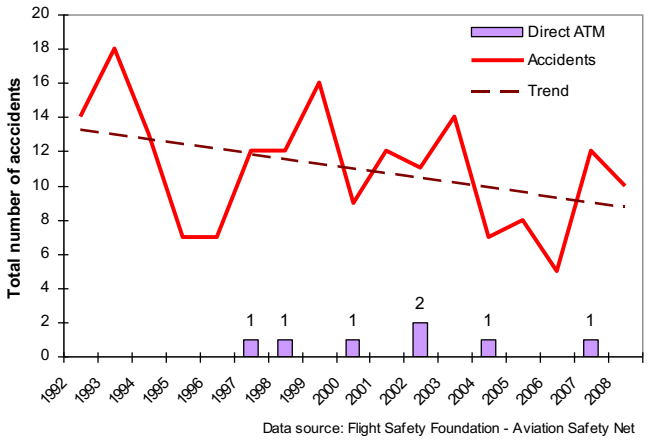


ANS and AIG only

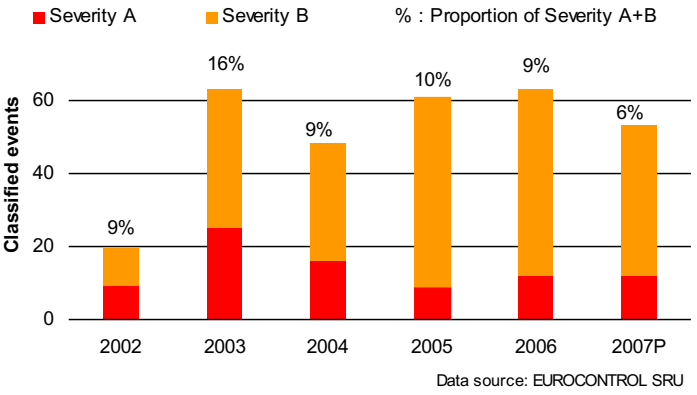
State and ANSP maturity surveys Current target



Commercial air transport accidents



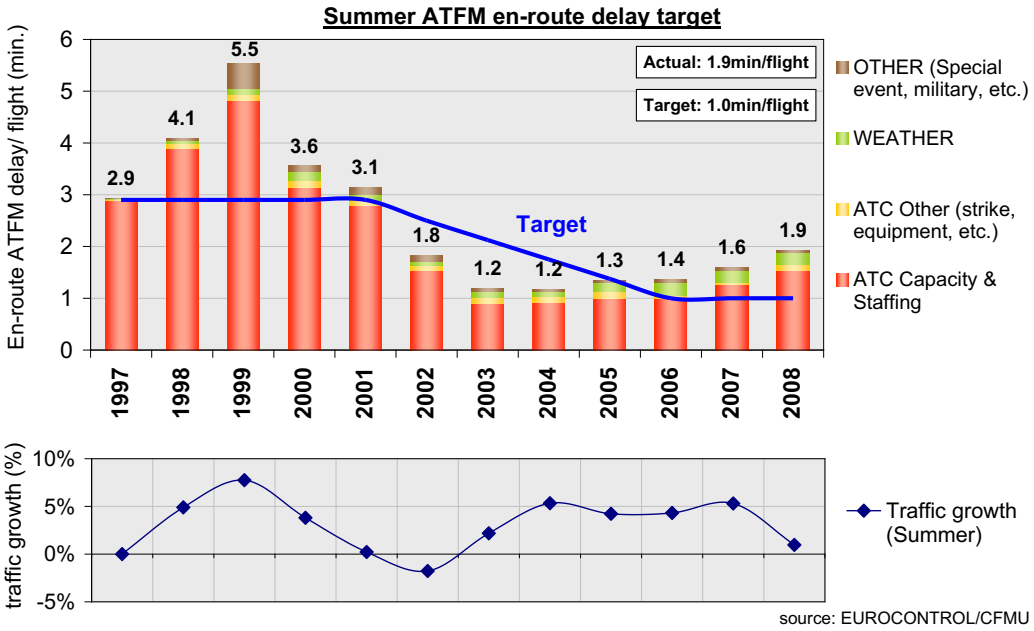
Reported high-risk runway incursions



Performance Review Commission

ATFM Delays – En-route

- **ATFM delays**
  - ~25% of airline delays
- **Performance target**
  - En-route ATFM: 1 minute per flight
  - TMA: tbd
- **Key performance indicators**
  - Europe: Yes
  - ANSP: Yes
- **Regulations**
  - Minimal
- **Performance management**
  - Co-operative capacity management



European delay target → ACC capacity targets

European delay forecast ← ACC capacity commitments

ATFM delays

Major improvement since 1999

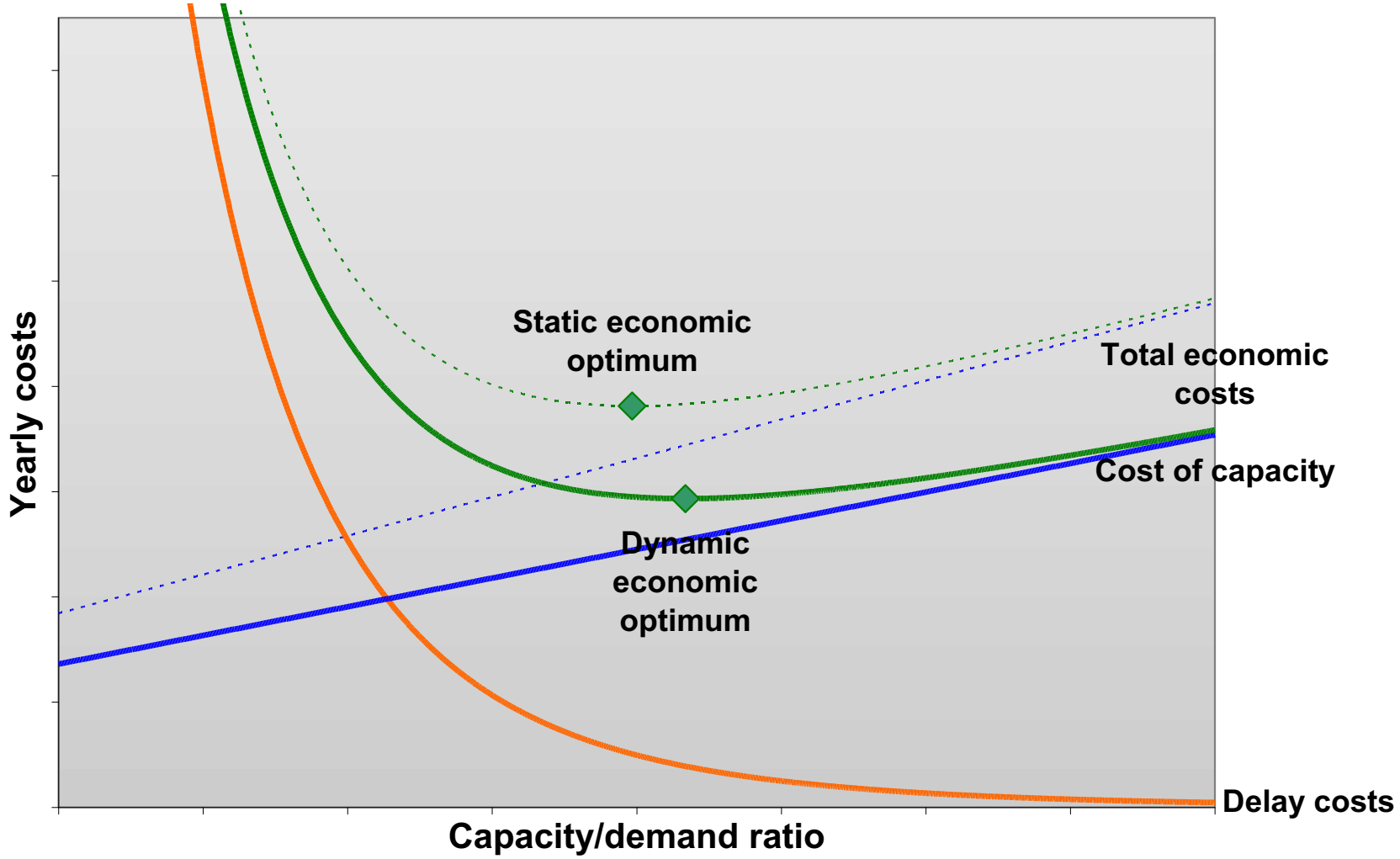
Target set wrt optimum delay

Target exceeded since 2006

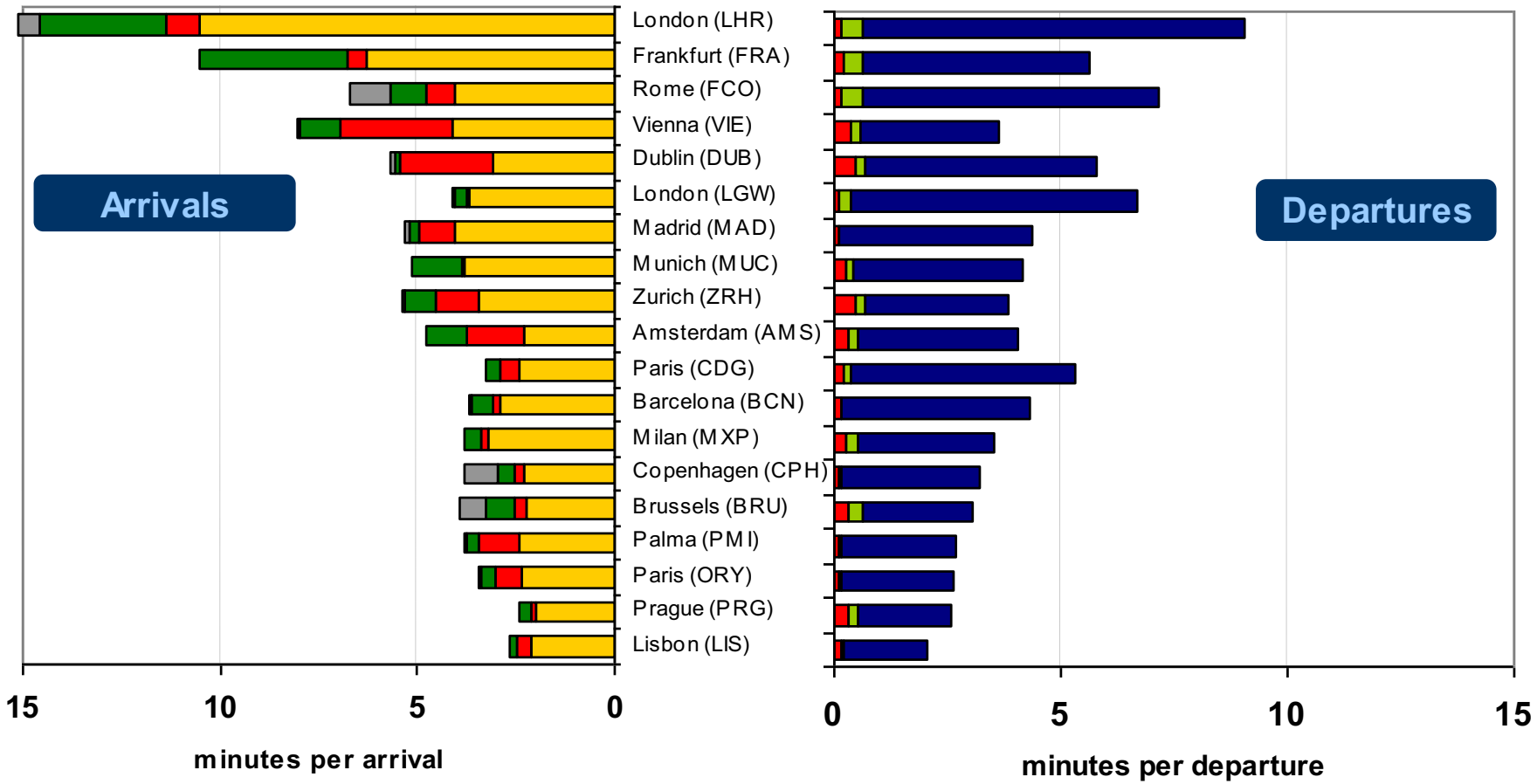
En-route delay cost ~ € 900 M

Capacity/Cost-efficiency trade-off

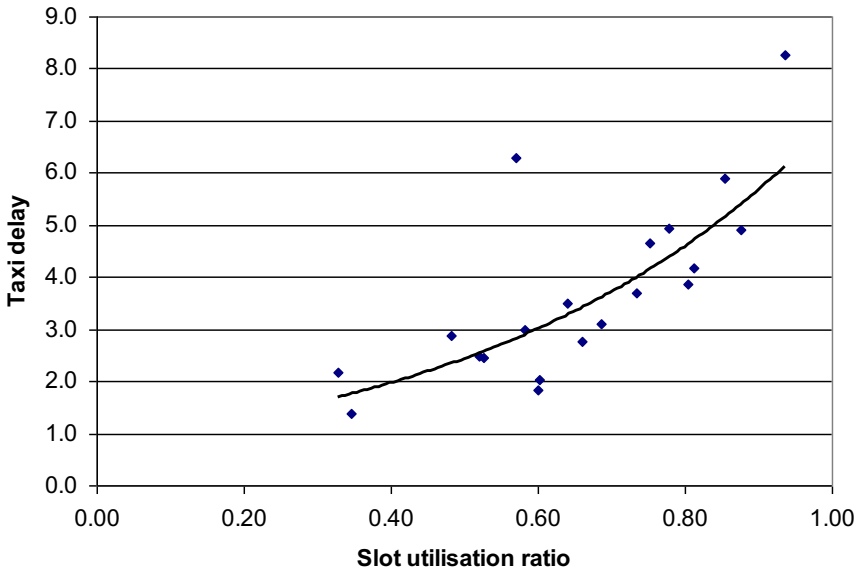
- **En-route ATFM delay target set with respect to current optimum (static efficiency)**
- **R&D should move the production cost curve (dynamic efficiency)**
  - Productivity improvement



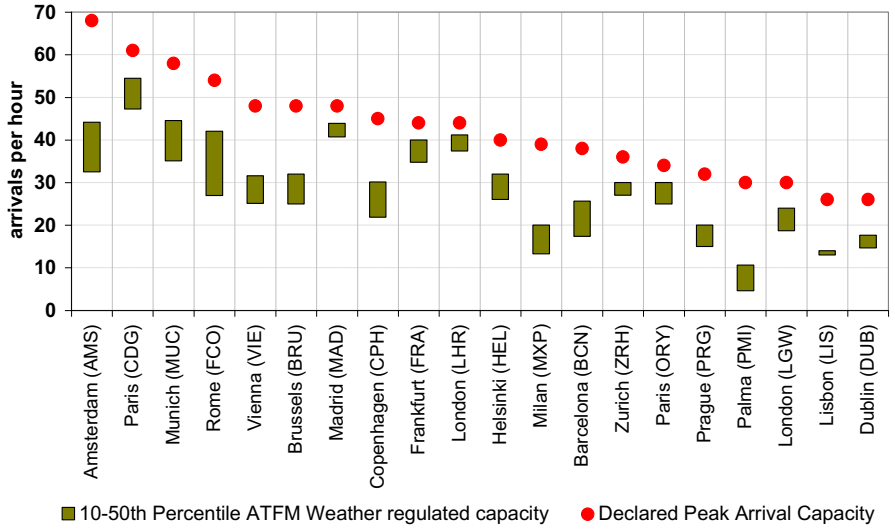
Delays at/around airports



Factors influencing delays at main airports



Scheduling intensity



Airport capacity in bad weather

Two major influencing factors at airports

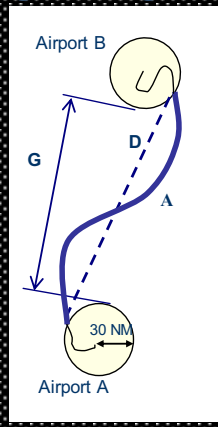
- Airport scheduling intensity
  - generates value (additional slots)
  - but increases delays
  - Where is the optimum?
- Sustaining high capacity in bad conditions
- Priorities for R&D!

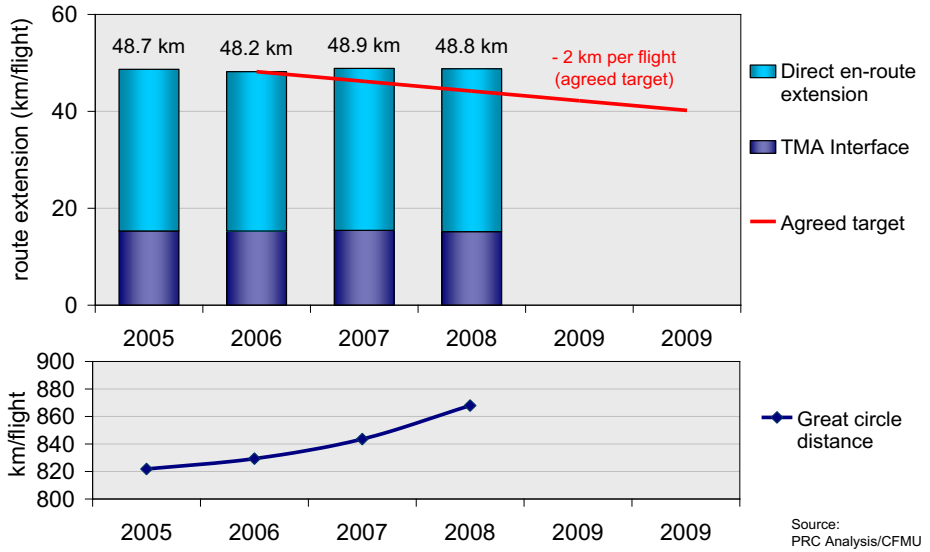
Flight-efficiency

- **Flight efficiency is a major performance issue**
  - High economic impact (>€3 B p.a.)
  - Significant environmental impact
  - Horizontal en-route part is high
  - TMA and taxi delays also very significant

	Fuel	Total M Euro
Horizontal flight efficiency	**3.6%**	**2400**
Vertical flight efficiency	**0.6%**	**130**
TMA airborne delays	***1.6%***	
Taxi delays	***0.8%***	
Total	**6.4%**	**> 3000**

- **Performance target**
  - -2 km/flight/annum (4% of 50 km)
  - Nearly cancelling traffic growth impact if met
  - Relative improvement masked by growing average distance
- **Key performance indicators**
  - Europe: Yes
  - ANSP: Yes
- **Regulations**
  - Minimal
- **Performance management**
  - DMEAN: Flight Efficiency plan

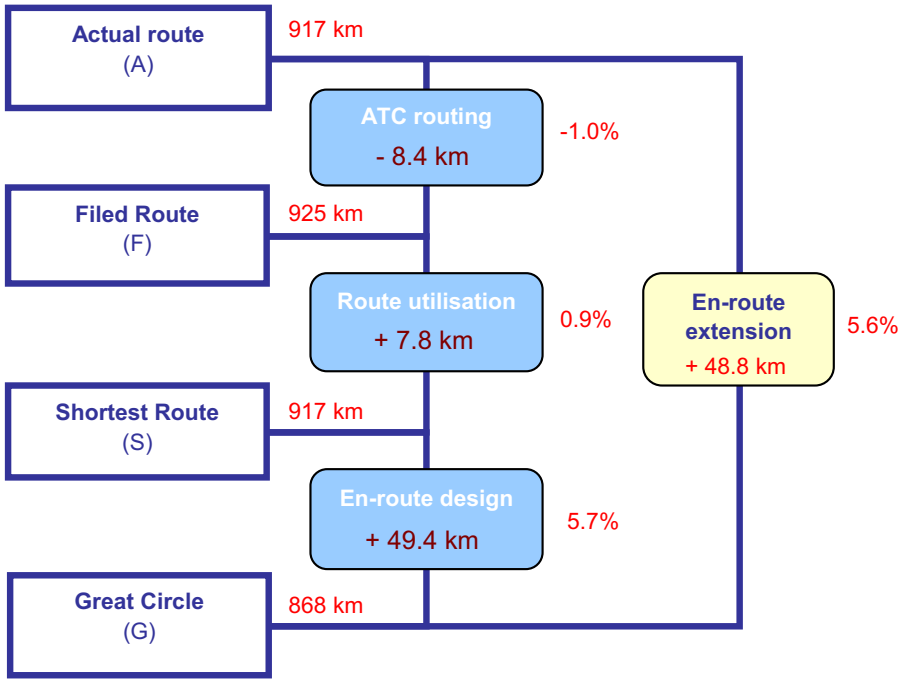




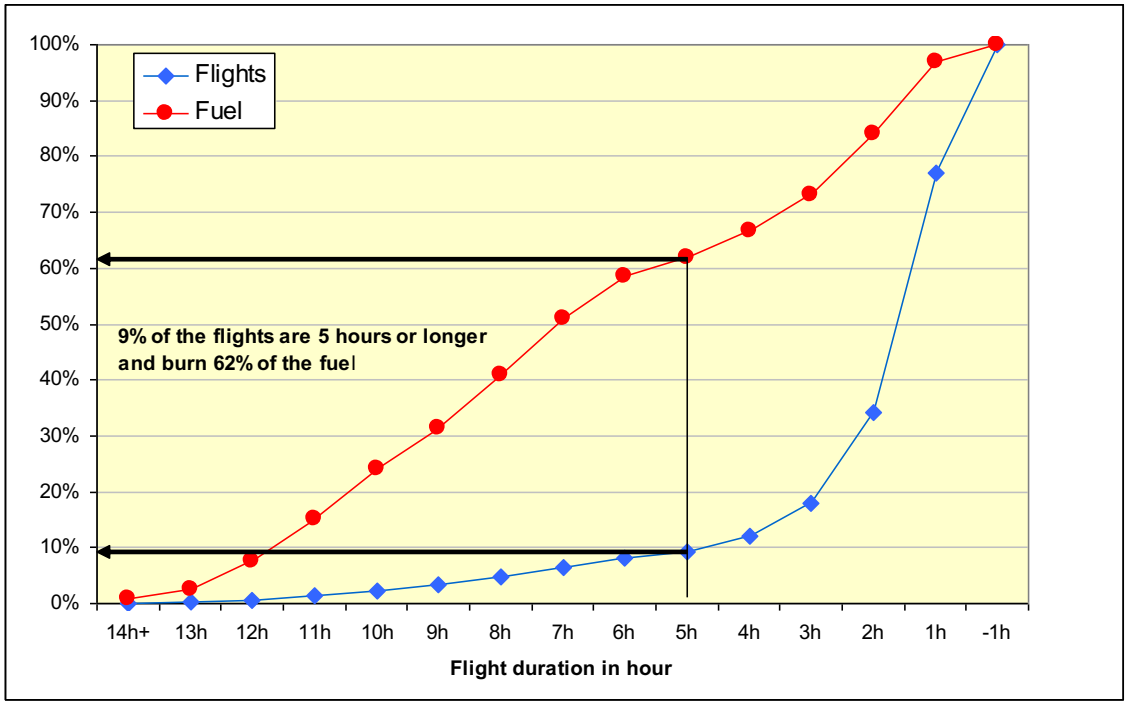
Performance Review Commission

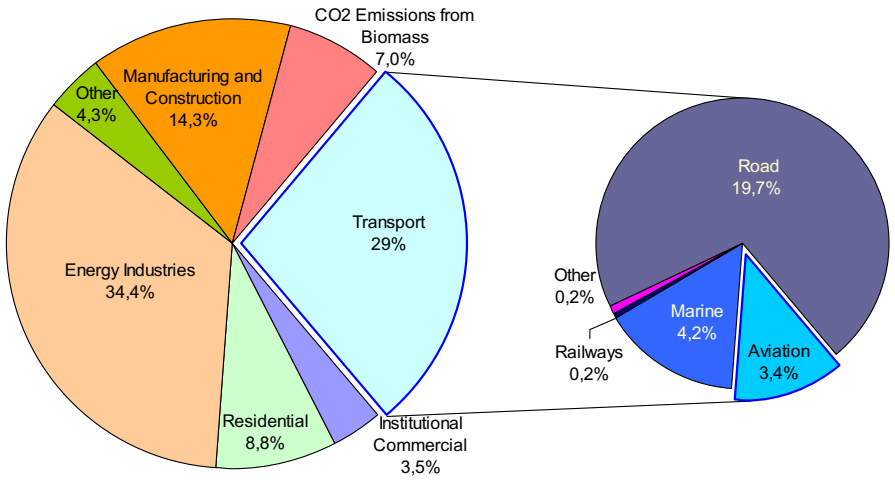
Capacity / Flight-efficiency trade-off

- **En Route flight-efficiency mainly originates from route design**
- **Trade-off with capacity**
  - More route structure increases capacity (safety being equal)
  - But increases flight time, fuel burn and emissions
  - Optimum depends on density
    - Close to optimum routes for low density
    - Reserved airspace preferably in low density
    - Route structure needed in high density (TMA)



Environmental impact

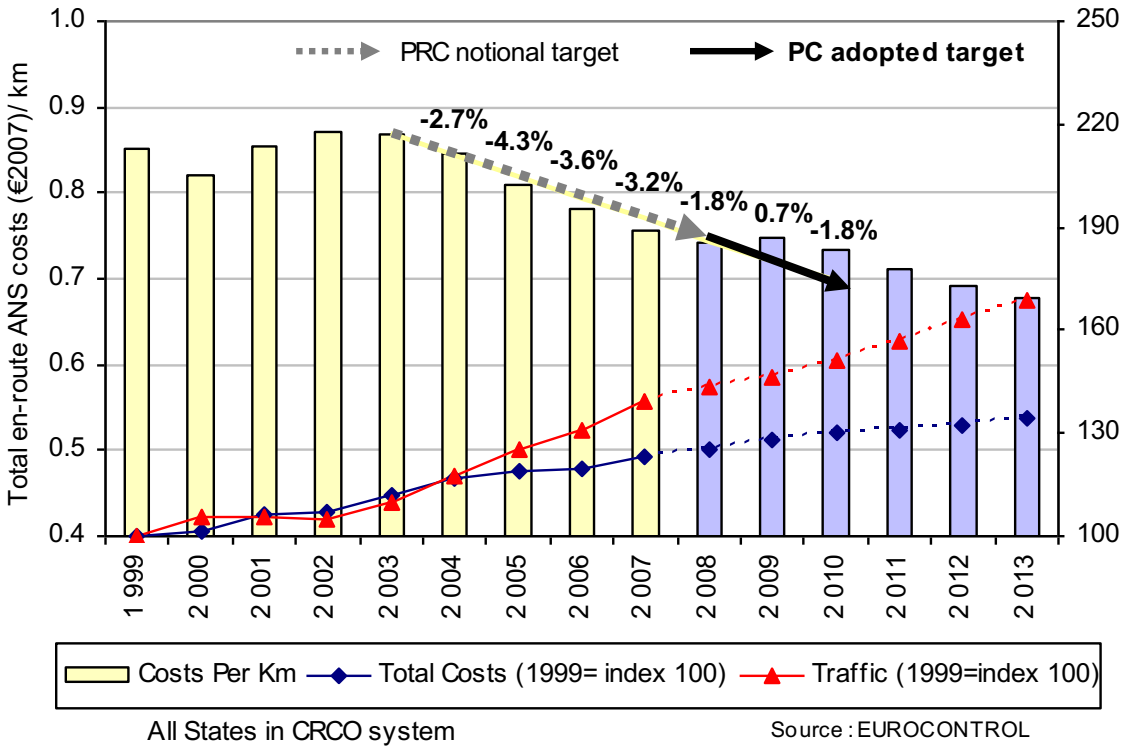




- **CO_2 emissions**
  - Closely linked with Flight-efficiency
  - Aviation: some 3% of all CO_2 emissions
    - ATM influences some 6% of aviation CO_2 emissions, i.e. 0.2% of all CO_2 emissions.
  - Long haul: 9% of flights and 62% of fuel
    - Issue of continental and global dimension
- **Noise: mostly a local issue**
- **Trade-off noise/emissions in TMA**

Cost-effectiveness

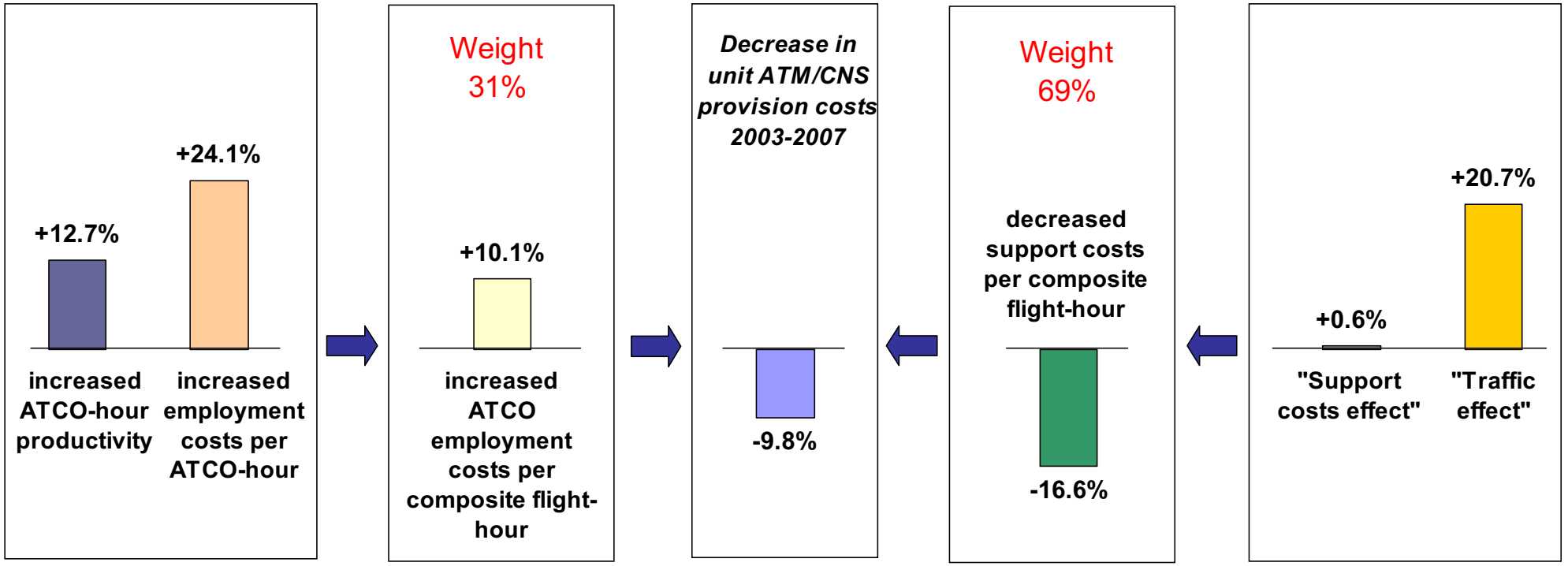
- **Performance target**
  - European target Agreed (RPI – 3%)
  - National targets: Few
- **Key performance indicators**
  - Europe: Yes
  - ANSP: Uniform benchmarking (ACE)
- **Regulations**
  - Europe: Reporting requirements, charging regime
  - Specific economic regulation in UK
- **Performance management**
  - Co-operative using benchmarking
  - Shared ANSP commitments



Clear trend break in 2003 (Benchmarking)
€2 B saved vs. trend since then
Growing unit cost in 2009

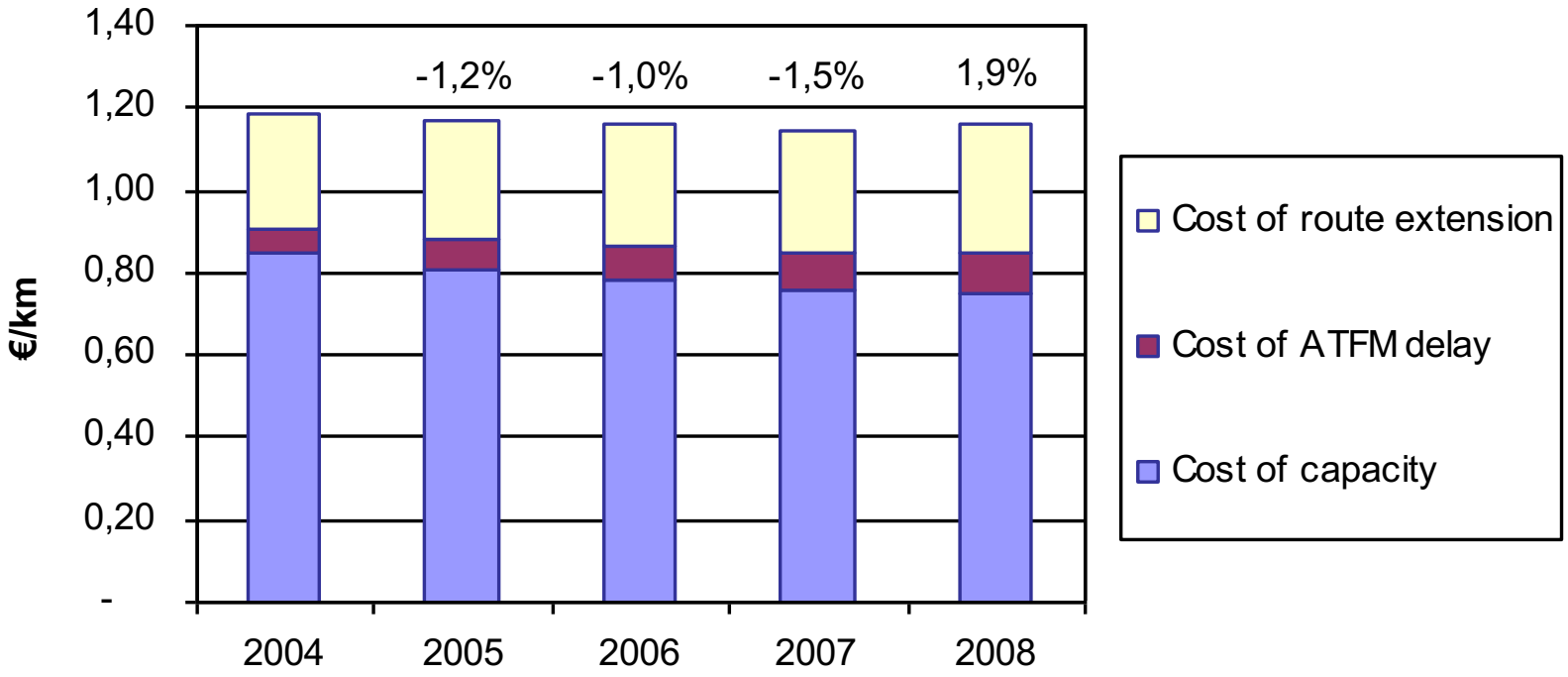
Financial cost-effectiveness trends (2003-07)

- **Improvements originate from containment of support costs**



Economic assessment

- Unit cost went down -3.4% p.a. between 2003-2007
- But ATFM delays went up
- Overall economic real unit cost: -1% (2004-07), +1.9% (2008)
- Unit cost will likely go up in 2009-10
- Opportunity to contain economic real unit cost with delays and flight efficiency

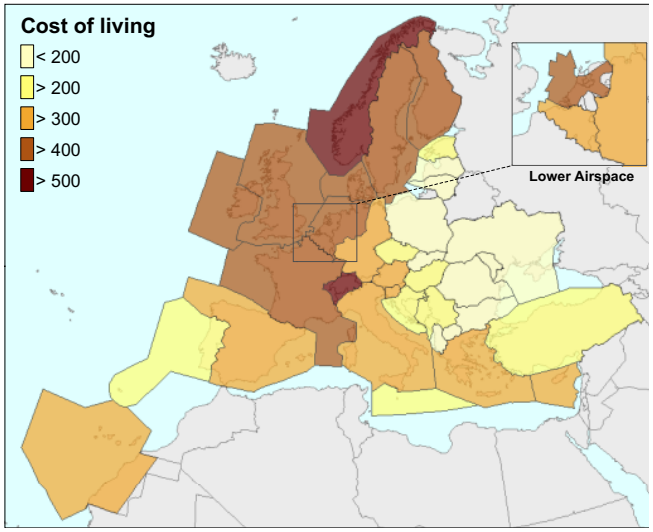


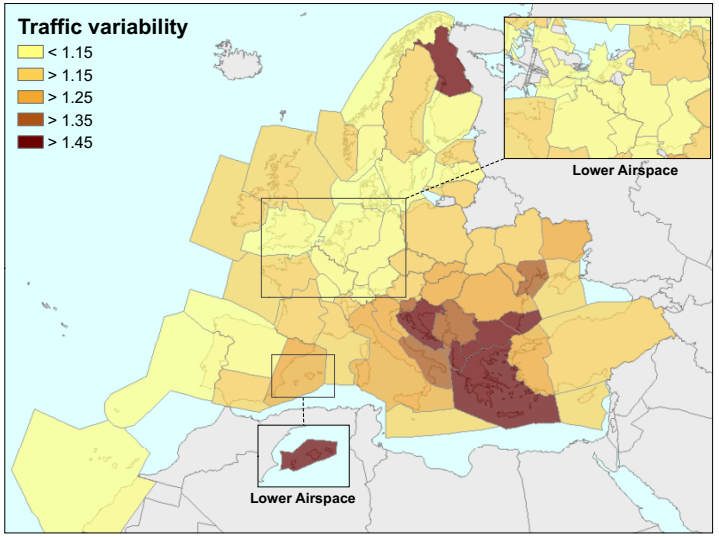
Factors affecting ANS performance (1/2)

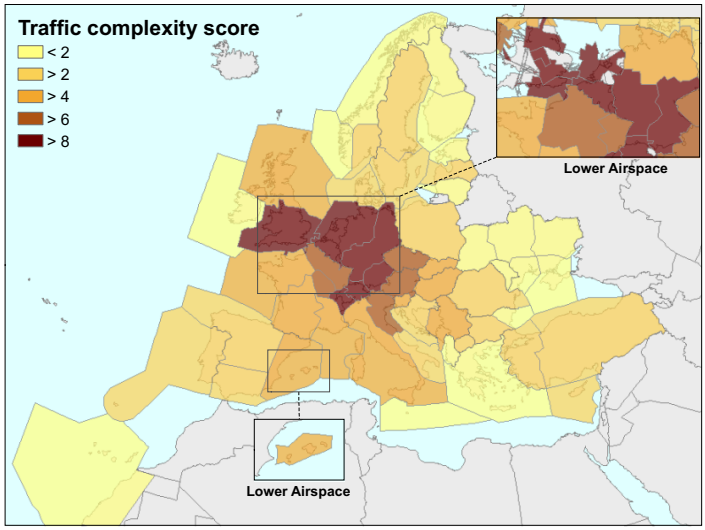
- **Exogenous versus endogenous factors**
  - important to assess and understand the impact on performance
  - Important for benchmarking purposes and for target setting

Factors affecting ANS performance (2/2)

- **Factors outside direct ANSP control which are measured by PRU:**
  - **Size**
  - **Cost of living**
  - **Traffic complexity**
  - **Traffic variability**

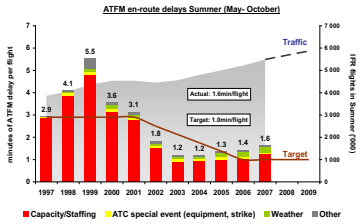
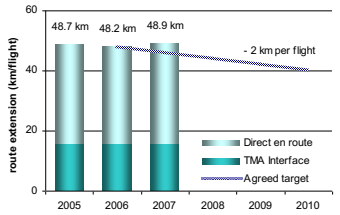
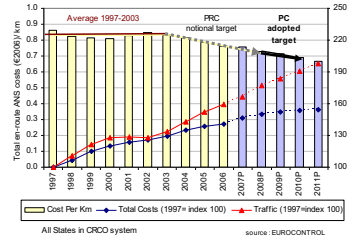






- **Performance is measured at European & local level – what the performance level is**
- **Factors influencing performance are partly identified and measured**
- **But normative analysis – what the performance level should be – is some way ahead**

ANS Performance status (2008)

Performance Processes	Safety	Delays	Flight efficiency	Cost-effectiveness
Performance targets	-	√	√	√
Data flow	Confidential	√	√	√
Performance indicators				
Regulation	Well advanced, not fully applied	Minimal Incentives (UK)	Minimal	Cost recovery Eco. Regul. (UK)
Performance management	Action plans SMS	Co-operative capacity management	European Co-ordination	Individual plans Benchmarking
Achieved performance	Trend unclear	Strong improvement But target missed	Improvement since 2008	Progressive improvement Lasting?

Single European Sky package II (SES II)

Legislative pillar

- **Performance Review -> Performance Scheme**
  - Binding targets, incentives
- **Functional Airspace Blocks (FAB)**
  - Now addressing all fragmentation, not only airspace
- **Network Management and design**

R&D pillar

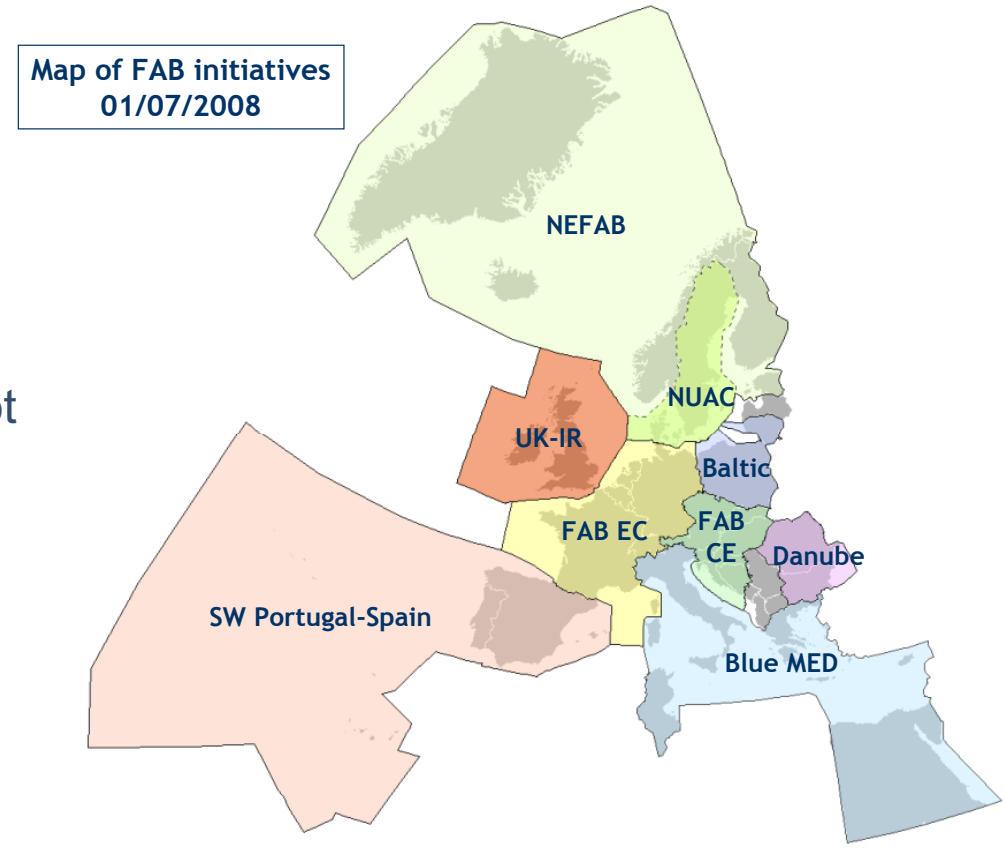
- **SESAR**

Safety pillar

- **EASA in charge of safety oversight for ATM and airports**

Airport infrastructure pillar

- **Observatory**

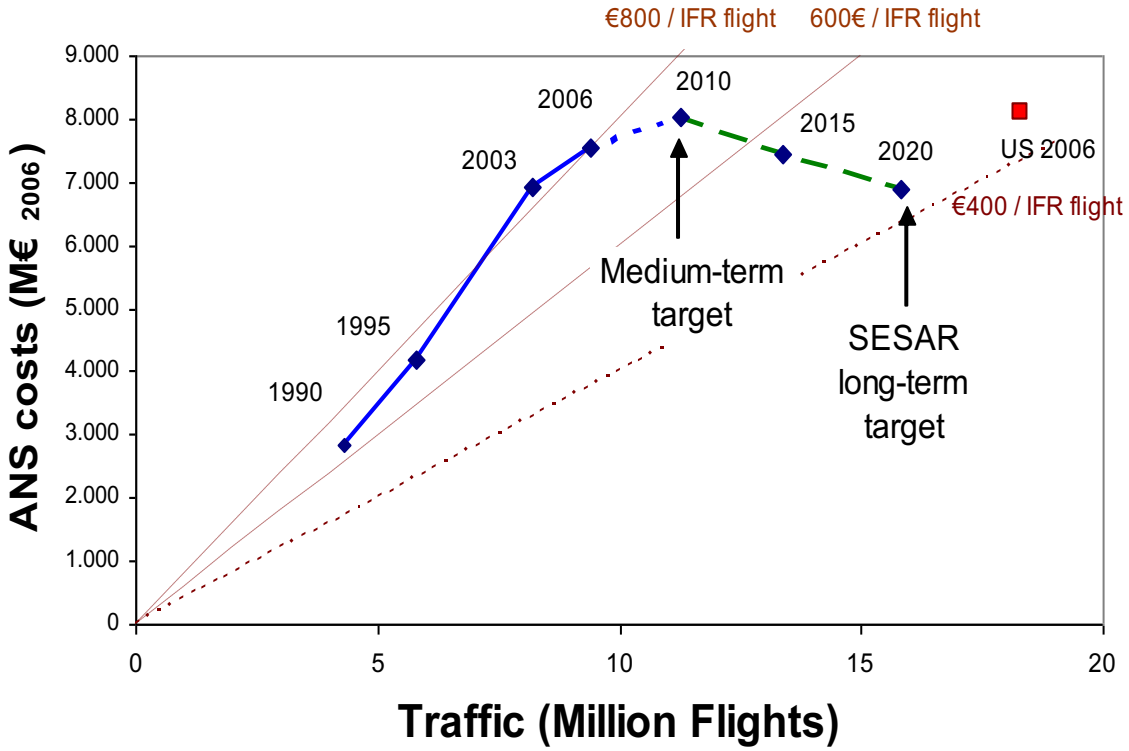


SES II performance scheme

- **The SES II performance scheme includes**
  1. Selection of appropriate KPAs, KPIs
  2. European targets (European Commission)
  3. Binding national/FAB targets, incentives and corrective measures (Mb States)
     - Targets set for 3 to 5 years
     - First reference period starts in 2012
  4. Reconciliation of any discrepancies between European and local targets
  5. Periodic review, monitoring and benchmarking of performance
     - ANS and network functions
  6. An independent Performance Review Body
     - assisting the EC, in coordination with National Supervisory Authorities (NSA)
     - assisting the NSAs on request
     - function likely provided by the PRC pending designation of the PRB

SESAR Design Performance objectives

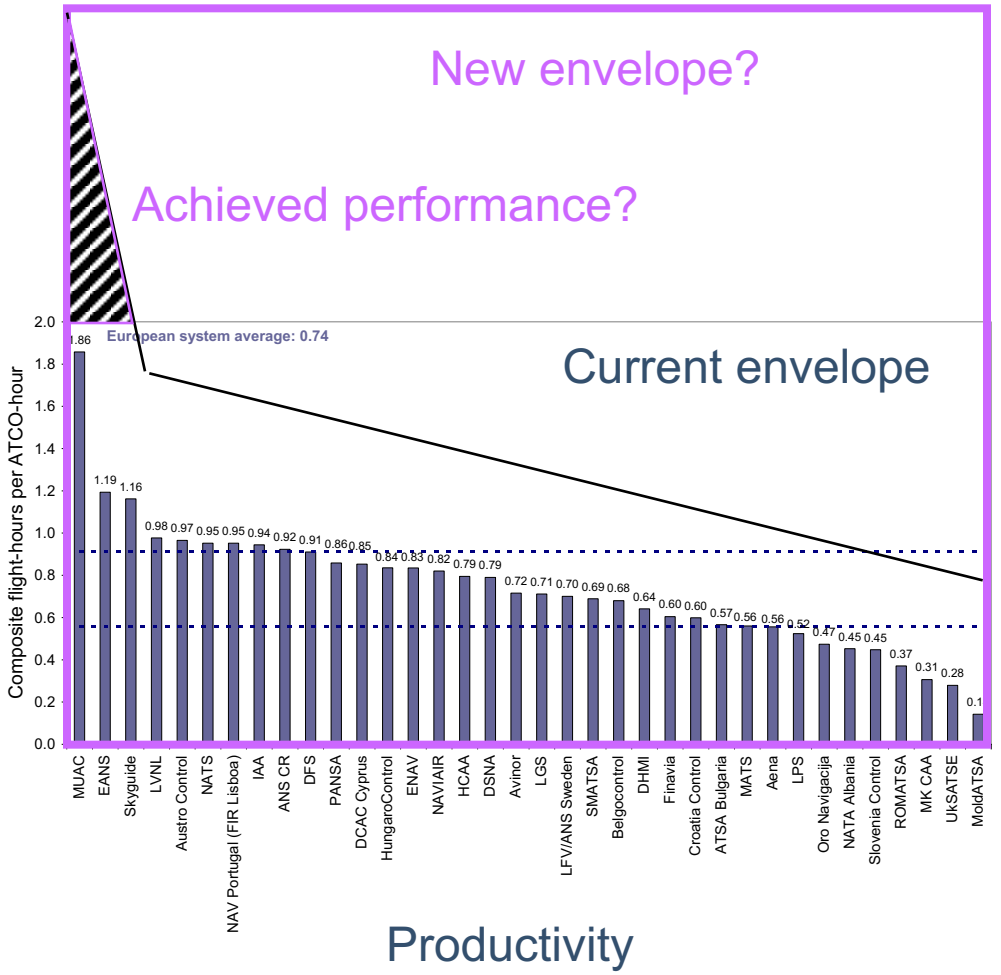
KPA	EC objectives 2020	Feasibility
Capacity	x 1.7	Done in US
Safety	x 3	US understood to be safe
Unit cost	x 0.5	Done in US
ENV impact	-10% per flight	Impossible from ATM alone (6.6%)



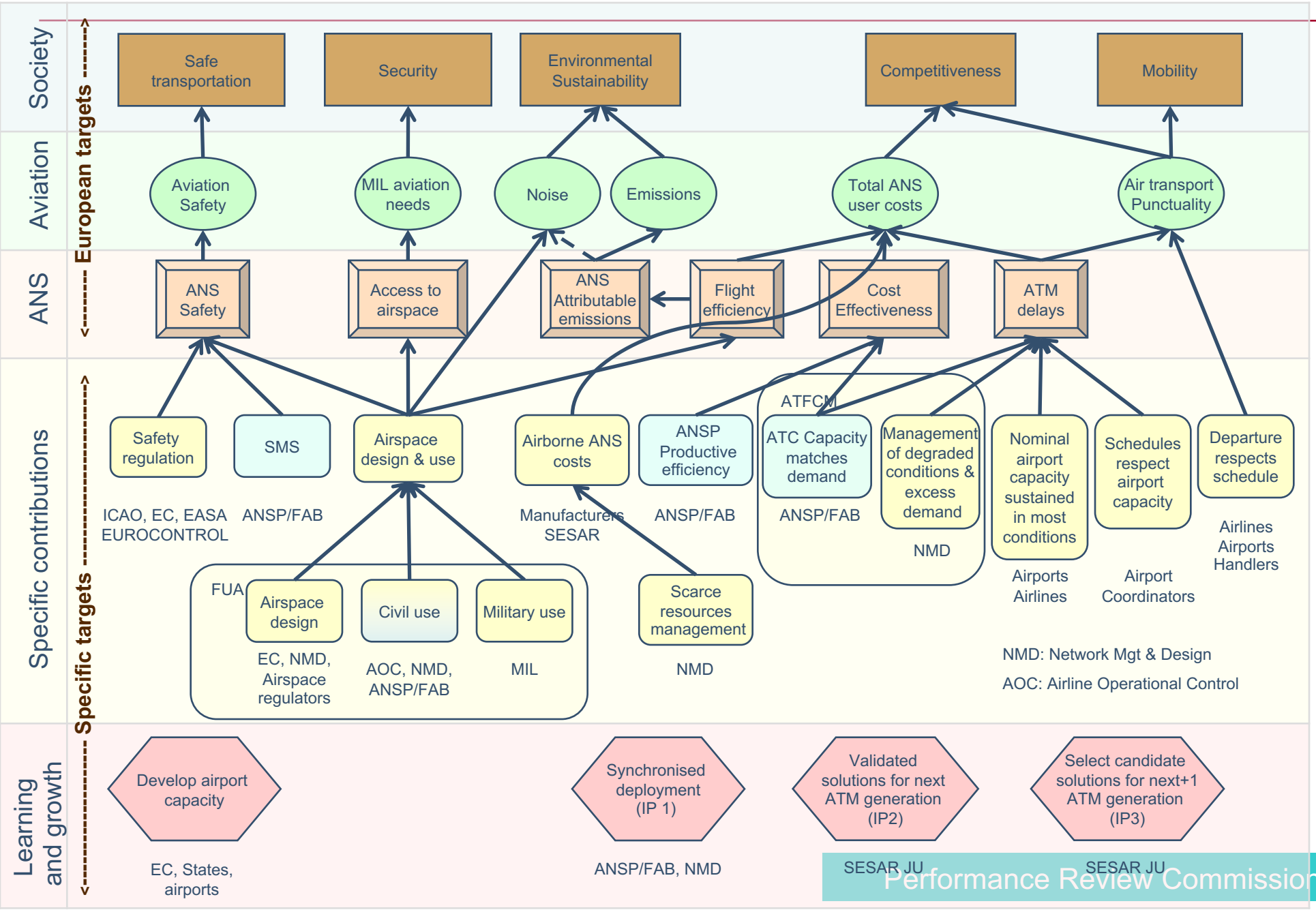
- At least one solution (except ENV): today's OPS concept and technology
- Investment in new technology must bring commensurate benefits on top

Improving Cost-effectiveness

ATCO cost per flight hour	30%	= ATCO cost per hour (Mgt) / Productivity (Flight hours/ ATCO hours) Mgt, R&D (+)
Invest + capital cost	20%	R&D (-)
Other staff, operating costs	50%	Mgt, Functional Airspace Blocks



Air-side performance influence diagram (draft)



Conclusions

- **So far, informative and cooperative approach to performance**
  - Performance improved over last 5 years, but relatively slowly
- **Current crisis adds additional challenge on economic side, eases capacity issues**
- **Approach reinforced through SES II**
  - Performance scheme
    - Binding targets, incentives
    - Independent Performance Review Body
    - Target setting requires
      - Relevant KPIs, selected to align behaviors with higher objectives
      - Measuring what performance is (factual)
      - Understanding and measuring influencing factors
      - Assessing what performance should be, taking account of external factors
  - FABs – Aimed at defragmentation of ANS business and airspace
  - Network Management
  - SESAR