

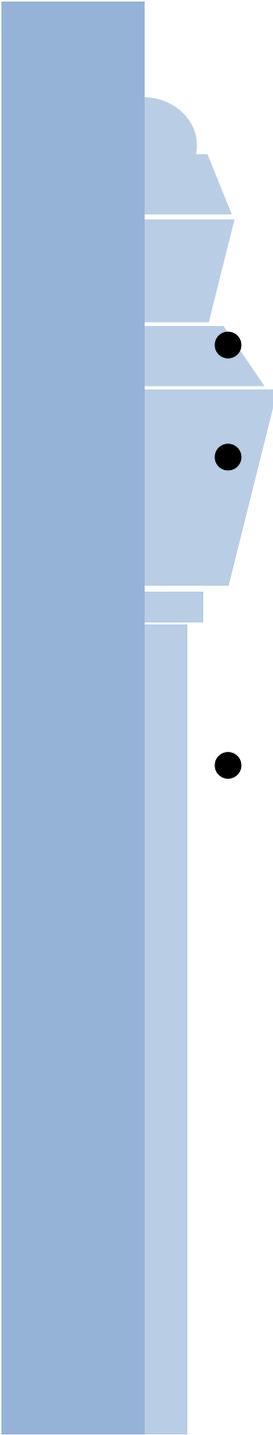
ACCHANGE

Lessons learned and way forward

Dr. Eef Delhaye

SID- 1/12/2015





Outline

- What was the project about?
- What did we do?
 - Problem setting
 - Scenarios and models
- What are the main conclusions and way forward?
 - Collaboration and performance
 - Regulation and performance
 - Liberalisation and performance

What was the project about?

- Starting point:
 - Implementation of SES initiatives has so far not met expectations
 - Up to now solution seemed to be regulation - orientated

(cf. also Impact Assessment 2013)

- Research questions:
 - What has led to current inefficiencies in air navigation provision? Is central implementation the way forward?
 - Potential paths for change in ATM in Europe: Can change come from within the sector?
- Methodology
 - Economic and numerical modelling

What did we do?

WP1: Taking stock of parallel experiences

- Models of liberalisation
- Introduction of new technologies

WP2: Air transport sector specificities

- Airlines
- Airports
- ANSPs

WP3: Selection of scenarios

- Ingredients (agents, incentives, technologies)
- Development of scenarios

WP4: Quantitative and qualitative assessment

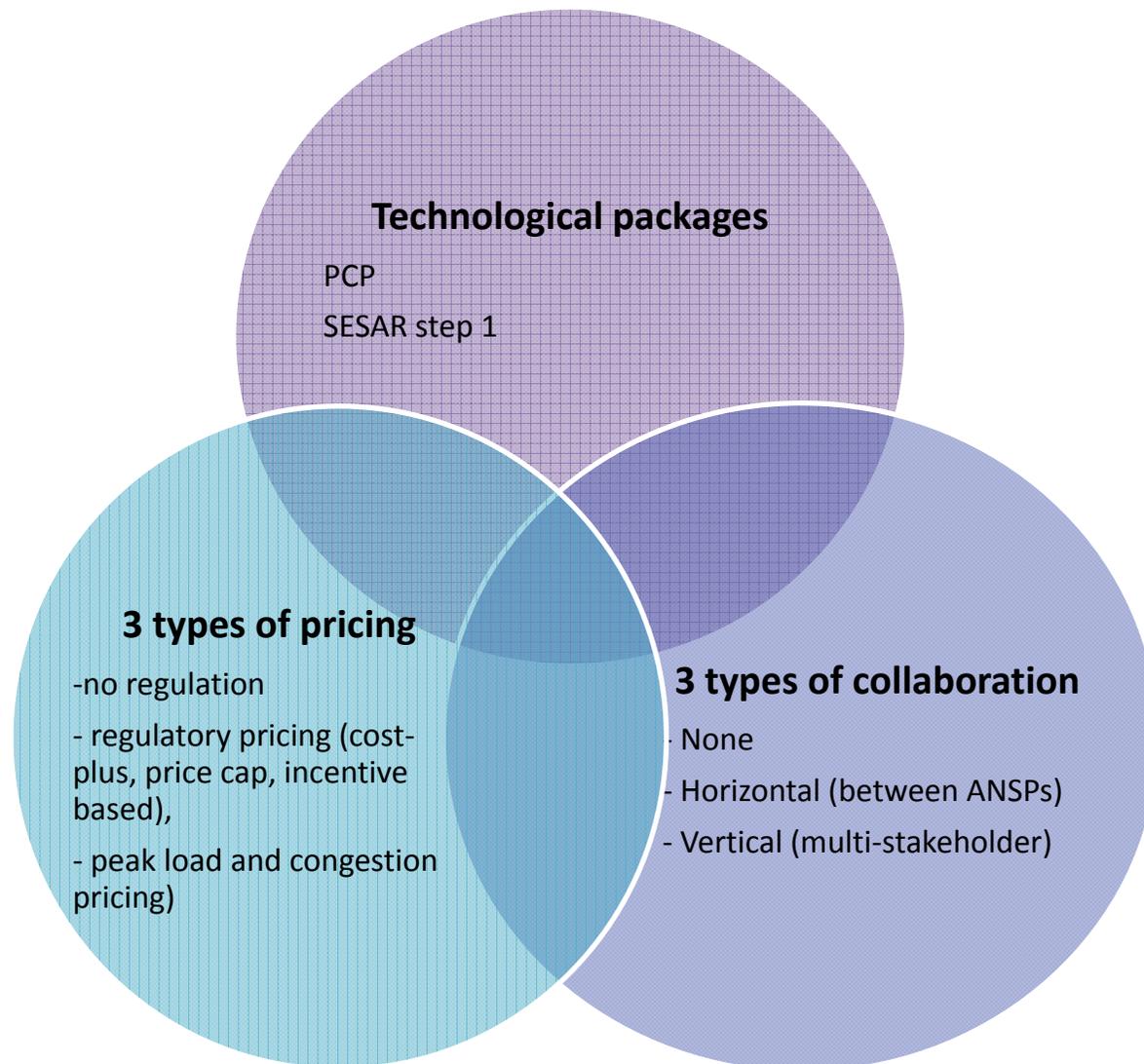
- A network congestion game
- A union bargaining model
- A public utility model
- And its extension to a simple network setting

WP5: Conclusions and Caveats

Problem setting

- Reasons for slower than expected change
 - National organisation -> Fragmentation
 - Home bias
 - Geographic monopoly ->incumbent inertia
 - Network character -> problems of coordination
 - Weak incentives + split incentives

WP3: Scenarios

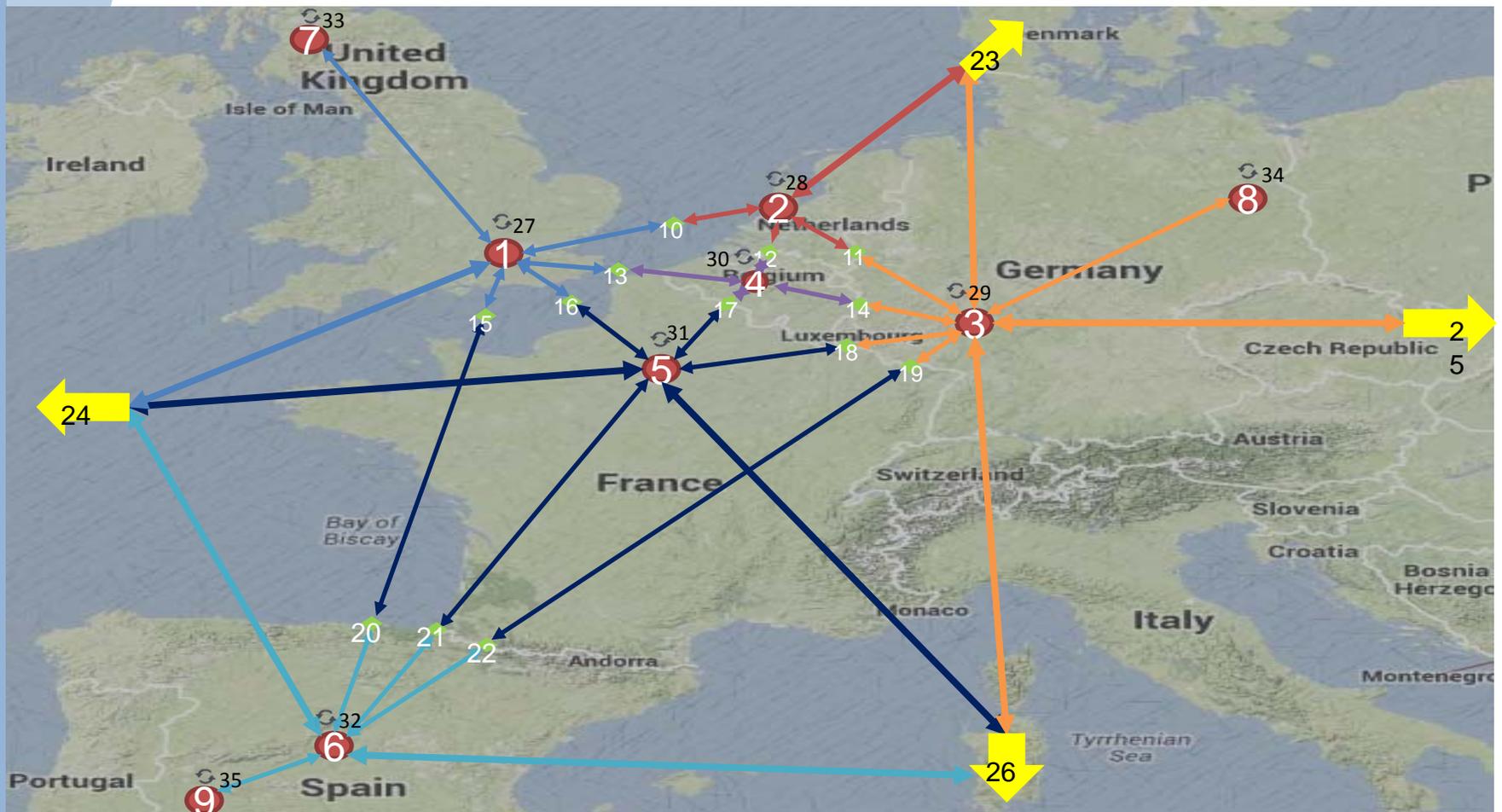


Model 1: Network congestion game

- Two stage game:
 - Stage 1: ANSPS set charges according to profit maximisation
 - Price-caps
 - Profit maximisation
 - Peak/Off peak price-caps
 - Stage 2: Airlines choose flight paths given schedules
 - 3 cost components: operational, congestion and ATC en-route charges
 - Revenue loss if they fly off-peak
 - Option “not to fly”
 - Two solutions for second stage
 - User optimal: airlines set flight paths to minimize own costs
 - System optimal: central planner set flight paths to minimize sum of airline costs
- Basecase + 5 scenarios (*4)

Model 1: Network congestion game

- Case study of Europe – 6 ANSPs



Model 2: Union-bargaining model

- Economic agents

- Airlines:

- Homogenous; Inelastic demand if price is below threshold
- Perfect competition

- ATC:

- Use a certain technology that combines other costs with input of controllers
- Technology determines
 - capital/labour mix
 - the minimum labour/flight
 - Bargaining power ATC union

- ATC Unions

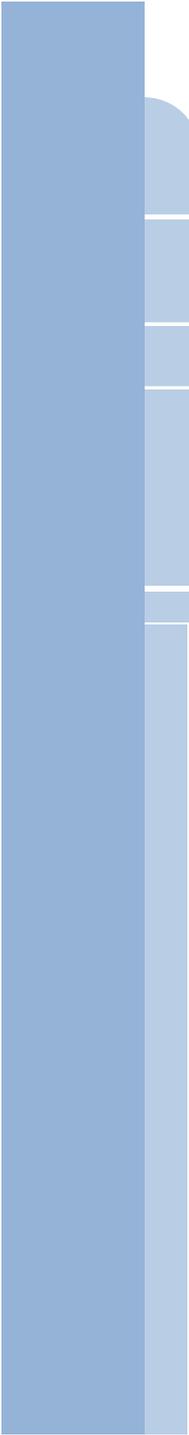
- Negotiate on wage and employment
 - Higher wage means a better salary than market for same qualification
 - More labour means more relaxed work conditions, less hours per week, etc.
- Labour union power (eg. Strikes)

- Regulator

- Regulates ATC
- Bargains with Union
- Wants to maximise consumer surplus of flights and own revenues (= minimize costs of ATC)

Model 2: Union-bargaining model

- Two-stage game
 - Stage 1: choice of technology
 - Stage 2: choice of wage and employment – asymmetric Nash bargaining solution
- Scenarios
 - Explaining inefficiencies in
 - Cost+ regime
 - Price-cap
 - Will ATC invest in new technologies
 - Operational innovation
 - Drastic innovation
 - Incentives for ATC to adopt time of day pricing
- Empirical validation - estimation of
 - bargaining power parameter
 - Union preference parameter (wage vs. Labour)



Model 3: Public efficiency model

- No network: analyse the behaviour of 1 individual ANSP
- Interaction ANSP- regulator with imperfect information
- Investigate effectiveness of performance regulation on ANSP incentives for
 - Cost-efficiency
 - Quality of service (mainly related to capacity)
 - Technology adoption
- Numerical illustration

Model 4: Simple network model

- Integration labour union model and efficiency model
- 2 models:
 - Vertical cooperation between airport and ANSP (regional forerunner)
 - Horizontal cooperation between ANSPs (en-route ATM)
- Goal:
 - Effects on cost-efficiency incentives
 - Effects on technology adoption (efficiency-enhancing, capacity-enhancing)
 - Effect of on detours and environmental targets
- Empirical illustration

Way forward

- Collaboration and performance
 - > we need a balance between collaboration and competition as a leverage for market-oriented change
 - ANSP collaboration
 - Potential of such collaboration is small due to limited incentives (cf. inelastic demand)
 - Performance regulation can help, but extend is limited by presence special interest groups (labour unions)
 - Top down regulation will probably lead to (pro-forma) collaboration, but limited performance improvements
 - Need for market based incentives
 - Multi-Stakeholder collaboration
 - Introducing competition (between airlines and airports) within goal ANSP
 - Modelling showed improvement in performance

Way forward

- Regulation and performance
 - Cost-plus versus price-cap regulation
 - Price cap gives more incentives than cost-plus regulation but
 - Quality might deteriorate
 - Limited incentives to invest in new technologies
 - > hybrid price caps to include quality
 - Problem of interest groups and hidden subsidies

Way forward

- **Liberalisation and performance** (disclaimer – less related to ACCHANGE)
 - Liberalisation as a tool to introduce competition
 - Different pathways possible – not all bring benefits
 - 1) Open tenders
 - Variety of forms with respect to geographical coverage and length
 - Minimum target levels
 - Problems of practical implementation and acceptability
 - 2) Unbundling of part of ATC functions
 - Support services such as ARFM, ATC
 - Cf. idea of centralised services but it might be more realistic to start unbundling at national level? + tendering
 - > over time consolidation with few providers benefitting from economies of scale, but with competition
 - 3) Virtual centers
 - As a game-changer in current status quo
 - In the modelling: impact bargaining power (even if not used)
 - > facilitate implementation contingency services

Conclusion

- Introduction of performance incentives will be key driver for stimulating market-oriented changes
- Price regulation and charging regimes will continue to be a cornerstone for change but they are likely to be insufficient
- Multi-Stakeholder cooperation will help
- But partial liberalisation might be needed