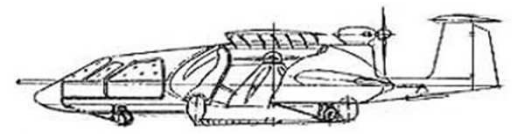


ACARE and Flightpath 2050 impacts on hybrid aircraft ESTOLAS development

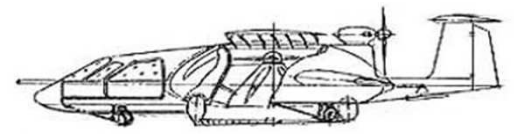
Vladimir Papkov
Jacqueline Bubos
Nachiket Kale

11.10.2013

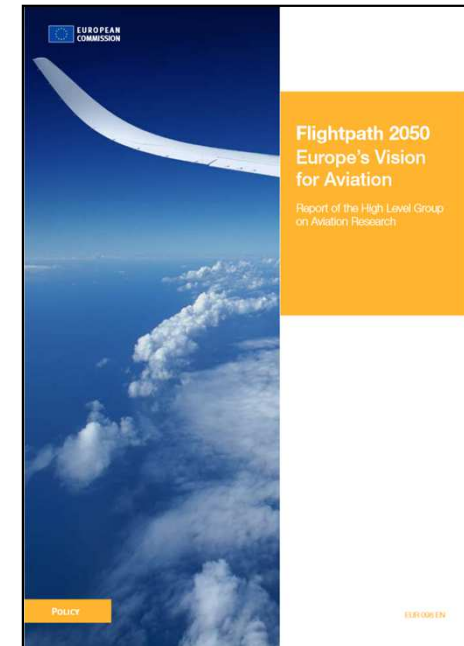


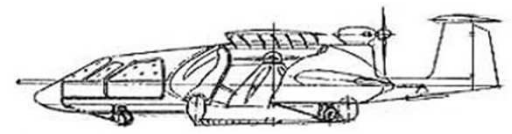


- **Advisory Council for Aeronautics Research in Europe:**
 - Expedite Aviation Research & Development to obtain the competitive advantage of Europe
 - 9,4 million flights with over 600 million PAX every year
 - 82.000 aerospace company supports 8.7 million jobs
 - 600bn Euros turnover per year
 - 7bn Euros are reinvested every year in civil aeronautics R & D
 - Includes member states, the Commission and Stakeholders (over 40 members)
 - Establishes a Strategic Research Agenda (SRA) that will influence all research projects of Stakeholders



- **Vision 2020:**
 - Issued by a group of personalities from key stakeholders invited by commissioner Philippe Busquin
 - Focused on Research, Technology and Development
 - 2 main aspects:
 - Responding to Society's needs
 - Becoming a global leader in the field of aeronautics
- **Flightpath 2050: Goals of Vision 2020** are projected to year 2050





Safety and Security

- Reduce number of accidents by 80 %
- Risks effected by weather and other hazards are properly mitigated
- Air vehicles are resilient by design
- Air transport system has a fully secured global high bandwidth data network

Industrial Leadership

- European Aviation Industry has a share of more than 40% of its global market
- Europe maintains leading edge design, manufacturing and system integration capabilities and jobs supported
 - Reduce the time till launch

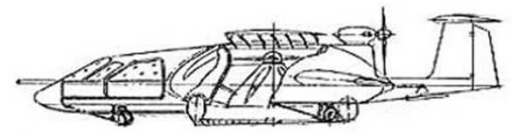
Flightpath 2050

Environment

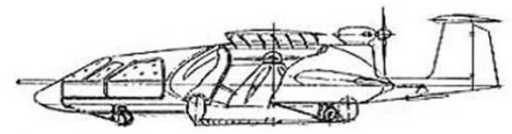
- Reduce CO2 emissions by 75 %
- Reduce NO2 emissions by 90 %
- Reduce noise emission by 65 %
- Europe as a center of excellent alternative fuels
- Air vehicles are designed and manufactured to be recyclable

Efficiency of air transport systems

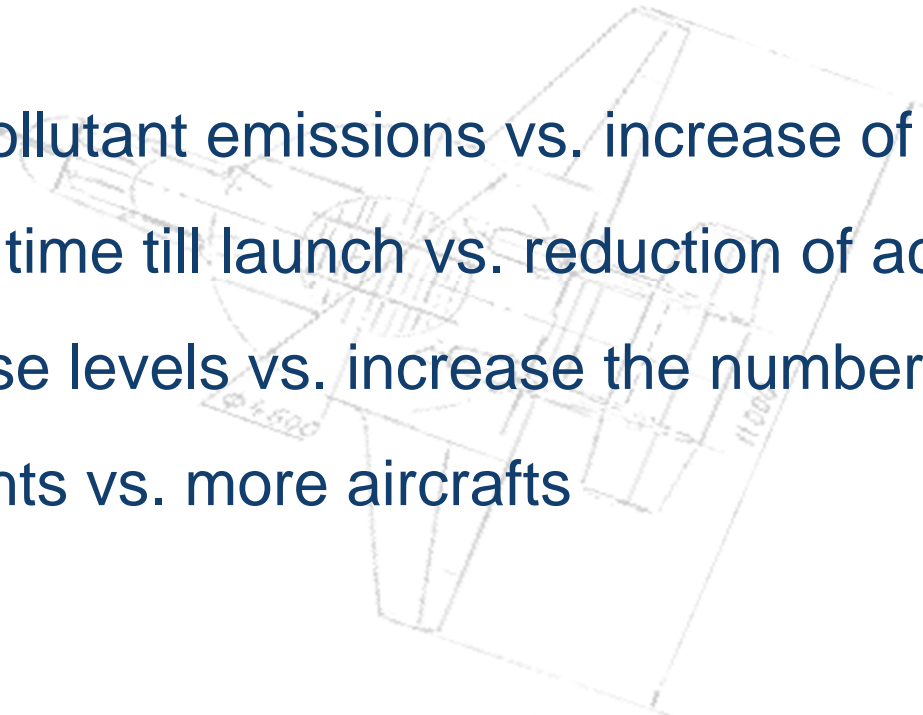
- Triple increase of capacity
- Coherent ground infrastructure
- 90 % of travelers within Europe are able to complete their journey, door-to-doors within 4 hours
- Flights arrive within one minute of the planned time

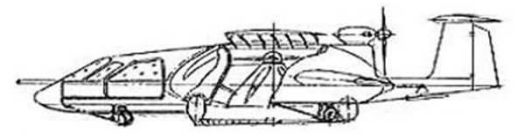


- Some of the ACARE goals are achievable inherently by the ESTOLAS design philosophy as well as by subsequent development in engineering
 - Especially environmental goals are achievable by ESTOLAS, as it is an hybrid aircraft
 - Reduction in number of accidents possible through diligent design and safety analysis process
 - Hybrid aircraft allows for design of functional redundancies and overlaps in multiple essential systems, leading to possible resilience in design
- Some objectives are not aligned with the primary motive behind the requirement, the area of application (remote locations with lack of conventional connectivity) and potential markets that motivated the ESTOLAS design.

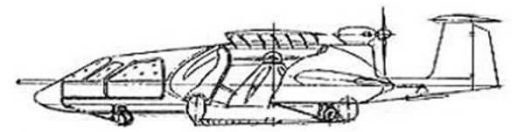


- Although the goals of **Flightpath 2050** are very ambitious, several contradictions appear
 - Reducing pollutant emissions vs. increase of capacity
 - Reduce the time till launch vs. reduction of accidents
 - Reduce noise levels vs. increase the number of flights
 - On time flights vs. more aircrafts





Thank you for your
attention!



- **European Union**, “*Flightpath 2050 – Europe’s Vision for Aviation*“, 2011, URL: <http://ec.europa.eu/transport/modes/air/doc/flightpath2050.pdf>, (Oct 2013)
- **Szodruch**, Joachim, DLR, “*Die Zukunft der Luftfahrt – Die europäische Vision 2020*“, 2006, URL: http://www.dglr.de/literatur/publikationen/DGLR_Szodruch_Vision2020.pdf (Oct 2013)

