On-Demand Mobility
Clean Sky
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www.cleansky.eu
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1. Brief Re-Cap on *Clean Sky*

**Unique Public-Private-Partnership in Aeronautics**

- Integrated, thematic set-up
- Downstream approach
- Large-scale complex demonstrations
- Open Calls for engaging wide set of participants

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Not legally binding
Good Progress to Date

- On track towards the key environmental objectives
- 75% of the work committed or achieved
- Approx. 600 participants (still growing)
  >15% SMEs and >27% Academia/ROs
Vision 2020 and Flightpath 2050 targets are for new aircraft technology relative to 2000 performance.

Important Trade-offs for all stakeholders:

- Reduce perceived external noise by
  - 50% by 2020
  - 65% by 2050

- Reduce NO\textsubscript{X} emissions by
  - 80% by 2020
  - 90% by 2050

- Reduce fuel consumption and CO\textsubscript{2} emissions by
  - 50% by 2020
  - 75% by 2050

Not legally binding.
Flightpath 2050
Goals to take ACARE* beyond 2020

*Advisory Council for Aviation Research in Europe

By 2050 compared to year 2000 datum

- 75% reduction in CO$_2$ per passenger kilometre
- 90% reduction in NOx emissions
- 65% reduction in noise

Strategic Research & Innovation Agenda – goals:

Meeting Societal and Market Needs
Maintaining and Extending Industrial Leadership
Protecting the Environment and the Energy Supply
Ensuring Safety and Security
Prioritising Research, Testing Capabilities & Education

Requires Improvement in all areas

Airframe
Engine
ATM & Operations

Not legally binding
Enabling Seamless Mobility within increasingly Constrained Infrastructure
Clean Sky 2 Programme: New features

- **Clean Sky 2: 2014-2020 (end 2024)**
- **€ 4 billion**, of which €1.8 billion is public funding: more than twice that of Clean Sky 1
- **Broader objectives**: still environmental, but also competitiveness and mobility
- **At least 800 participants expected** (estimation)
- **Inclusion of general aviation** (< 20 places)
Clean Sky 2: a wider scope with Horizon 2020

1. Complete Clean Sky 1:
   - Carry on with planned Demonstrators to fully meet TRL6
   - Develop new technologies to meet ACARE goals (40% CO2 reduction)

2. Strengthen European leadership in aeronautics

3. Contribute to improving intra-European mobility

4. Make the first step towards the 2035/2050 objectives set by the European aviation community

Not legally binding
EU co-funded Research & Innovation.

Several projects launched to develop SAT activities:

- Small Air Transport Roadmap (SAT-Rdmp*)
- Airframe (FP6 CESAR)
- Avionics (SAFAR)
- Systems & Propulsion (ESPOSA, HYPSTAIR).

Broader actions, also of relevance for SAT

- Forums/studies on Safety, Intn'l cooperation, …
- Research on flight measurement, morphing, personal a/c & drones, …

* [www.epats.eu/SATRdmp](http://www.epats.eu/SATRdmp)
EU initiative

• Outcome
  – Lot of unused airfields, esp. in Eastern Europe
  – Very often, bad roads and trains
  – Possibility to revitalize the SAT but needs of
    • Affordable aircraft
    • All weather capabilities
    • Adapted regulation for aircraft and airports
    • Stronger supply chain

Not legally binding
Support Action

- EU initiative
  - A SAT roadmap
  - Workshops organised
  - Needs identified
  - A real business case

Modal split of trips in Europe. 2020

A modal split is the percentage of travellers using a particular type of transportation or number of trips using said type.
Meeting Societal and Market Needs

- European citizens are able to make informed mobility choices.

- 90% of travellers within Europe are able to complete their journey, door-to-door within 4 hours.

- Flights arrive within 1 minute of the planned arrival time.

- Air traffic management system is capable of handling 25 million flights a year in Europe.

- A coherent ground infrastructure is developed.
What is average travel time by air transport for regions?

- **10** and more hours
- **9** to **10** hours
- **8** to **9** hours
- **7** to **8** hours
- **6** to **7** hours
- **5** to **6** hours
- **4** to **5** hours

1270 airports and 1300 landing fields = 2570 airfields

70% traffic = top 15 airports
Small Aircraft Transport
Transversal Activity within ITD

Innovative Aircraft Demonstration Platforms (IADPs)
Integrated Technology Demonstrators (ITDs)

EU Funding Decision
1.755bn€
(1.716bn€ “net”)*
* After running costs

Not legally binding
The Principles for Participation

- Up to 40% of EU funding available for CS2 Leaders
- At least 60% of EU funding open to competition:
  - Up to 30% for Core Partners (becoming Members once selected)
  - At least 30% for CfP (i.e. Partners as in CS) plus CfTs
- Meaning >1bn€ of EU funding in play, via open Calls

Industry, SMEs, Academia, and Research Organizations eligible both for participation as Core Partners or Partners. Participation may also take place via suitable Clusters / Consortia.
What is the Small Aircraft Transport Mode?

It is a segment of high-speed transport market, that serves local and regional low traffic connections

**Aircraft** - small 4 to 19 seats, that are low DOC, green, safe, and secure

**Infrastructure** on the ground and in the air - Regional Airports + ATM/ATC services integrated in SESAR

**Net – Centric Management & Acquisition** – ICT based logistic and management system for SATS, integrated within the SESAR’s System Wide Information Management (SWIM)
3. SAT in Clean Sky 2

• SAT: a transverse activity
• Budget: 4 % of the total budget (around 68m€)
• 4 strategic topics launched (wave 1 and wave 2)
  – More advanced and efficient small turbine engines for SAT market
  – Affordable SESAR operation, modern cockpit and avionics solutions for small aircraft
  – Optimized composite structures for small aircraft
  – More affordable small aircraft manufacturing

Not legally binding
**Piaggio Aerospace (IT)**
- Aircraft/Engine part manufacturer
- Workforce 1050 people
- Turnover 2014 192 M Euro
- P180 Avanti delivered 230 A/C

**Evektor (CZ)**
- Aircraft manufacturer, Design office
- Workforce 370 people
- Turnover 20 M Euro
- EV-55 (9 seats A/C) certification on going
- VUT100 Cobra & SuperCobra (4 seater)
- EuroStar, SportStar, Harmony (2 seaters)
  1400+ A/C delivered

Not legally binding
Multimodality and passenger choice towards Flight path 2050

a. To provide accessible and affordable high speed mode of transport on European interregional network connections with low-intensity traffic

b. 90% of travelers within Europe are able to complete their journey, door-to-door within 4 hours

Revitalization of European small aircraft industry, more competitive EU

More safe and more efficient small aircraft operation

Lower environmental impact (noise abatement, fuel efficiency, energy saving production)

Not legally binding
<table>
<thead>
<tr>
<th>HLO Priority</th>
<th>Technology focus</th>
<th>Quantitative target</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Operational Cost Reduction</td>
<td>Airframe manufacturing &amp; maintenance cost reduction Engine acquisition &amp; maintenance cost reduction Systems HM &amp; More Electric</td>
<td>25-30% on total operating cost</td>
</tr>
<tr>
<td>2 Safety Improvement</td>
<td>Systems for Pilot work load reduction</td>
<td>10 times fatal accident reduction</td>
</tr>
<tr>
<td>3 Cabin Improvement</td>
<td>Noise, Thermal, Entertainment</td>
<td>80 dBA</td>
</tr>
<tr>
<td>4 Community Noise</td>
<td>Low noise propulsion</td>
<td>-10 dBA (ICAO Chapter 10)</td>
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</tbody>
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* OEM: Original Equipment Manufacturer

Not legally binding
Relation with Regulation Authorities

- Clean Sky has relations with EASA, SESAR and Eurocontrol
- Clean Sky is a natural link between leaders (from CS) and the Authorities
Relation with Regulation Authorities: EASA

GA Road Map: Working towards... the future
Simpler, lighter, better rules for General Aviation

Boudewijn Deuss
SAT (Small Air Transport) Workshop
4 February 2016

European Roadmap for regulation of GA

Not legally binding
Strategic direction - six principles

**P1**: One size does not fit all (reduce cliff-effect)

**P2**: Philosophy of minimum necessary rules

**P3**: Adopt a risk-based approach (risk-hierarchy)

**P4**: Protect “grandfather rights”

**P5**: Apply EU “Smart Regulation Principles”

**P6**: Make best use of available resources/expertise
Small Air Transport development in the European future ATM System

Relation with Regulation Authorities: Eurocontrol

- Not legally binding
Some SESAR improvements – focus on SAT

- No specific Small Aviation Projects in SESAR 1 programme
- 1 project dedicated to Small Air Transport in SESAR 2020: evaluation of 4G (LTE) technology mainly for FIS-like related B services.
- But many R&D projects (SESAR and beyond) of direct importance for Small Transport Aviation notably:
  - Vision systems (EVS/SVS/CVS)
  - Multiple glide slope/Multiple threshold operations
  - Remote Control Towers
  - Business Trajectories/Mission Trajectories
  - ATM environmental improvements
  - CNS developments
  - RECAT-EU & RECAT 2
  - RPAS projects towards safe integration
Conclusion

• Large potential for Small Air Transport in Europe
• Need to work with all actors
• Helpful to get a more global picture
• Clean Sky willing to look for synergies
Thank You

Disclaimer

- The selection of Partners will be based on Horizon 2020 Rules for Participation, the rules for submission of proposals, evaluation and selection of Partners as adopted by the Governing Board of Clean Sky 2 JU and will apply to the calls for Proposals.
- The content of this presentation is not legally binding. This presentation wishes to provide a preliminary overview of these rules.
- The proposed content/approach is based on the consultation with the “National States Representative Group” and the “Task Force” of the Clean Sky 2 Programme.
Thank you for your attention

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