Clean Sky 2
SAT Transversal Activities

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Small Aircraft Transport
High Level Goals

- 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)
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<tr>
<th>HLO Priority</th>
<th>Technology focus</th>
<th>Quantitative target</th>
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| 1 Operational Cost Reduction | Airframe manufacturing & maintenance cost reduction  
Engine acquisition & maintenance cost reduction  
Systems  HM & More Electric | 25-30% on Total Operating Cost                                                  |
| 2 Safety Improvement   | Systems for Pilot work load reduction                                           | 10 times fatal accident reduction (scheduled part135 Operation) |
| 3 Cabin Improvement    | Noise, Thermal, Entertainment                                                    | 80 dbA                                                   |
| 4 Community Noise      | Low Noise propulsion                                                            | -10 dbA (ICAO chapter 10)                                |
Small Aircraft Transport Transversal Activity within ITD

Innovative Aircraft Demonstration Platforms (IADPs)
Integrated Technology Demonstrators (ITDs)
Small Aircraft Transport
Research Areas to Address in JTI CS2 – ITD Airframe

- Small Air Transport Overall A/C Design and Configuration Mgt
  - Interface & Cross-interaction Management
  - Reference aircraft (19 seats small commuter)
  - Coordination and execution (aircraft level) of demonstration activity
TRL

- Development
  - Innovation
    - Basic principles (Idea) or Technology gaps (Need)
  - Technology concept
    - Rig test (minimal design space)
    - Proof-of-concept
    - Expand design space
  - Demo/prototype
  - Flight Test
  - Qualification/certification
  - In service

- Resources
  - Stop
  - Check point go/no go

- Time
  - Development & Certification
  - Production

- R&TD Responsibility
  - 1
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8
  - 9
Optimized Composite Structures (wing box)

- Advanced out of autoclave (OOA) technologies
- Liquid Infusion (LI)
- More automation for low-volume composite production
Small Aircraft Transport
Research Areas to Address in JTI CS2 –ITD Airframe

• High Lift Wing (SAT)
  o High/Low Speed Innovative Aerodynamic Concept

Demonstrator under evaluation
More affordable small aircraft manufacturing

- More affordable metallic manufacturing (fuselage)
  - Optimization of Friction Stir Welding technologies
  - Automated metal structures assembling in low volume production
Electrical Landing Gear Demonstrator

- Innovative SAT electrical landing gear actuation and brake
SAT Electrical Power Generation & Distribution Demonstrator

- Innovative SAT high power electrical generation and distribution
- Electrical generation discussion with THALES is ongoing
Jet-Fuel Reciprocating Engine

- Technology for improved high power/weight ratio jet-fueled diesel engine

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- Combustor (Combus.)
- Mono. Configuration tests
- Multicylinder Concept
- Evaluation
- Des./Man.
- Tests
- Design
- Manuf.
- Tests
- Evaluation
- Design
- Manuf.
- Tests
- Evaluation
- Design
- Manuf.
- Tests
- Evaluation
- Design
- Manuf.
- Tests

Q1 Q2 Q3 Q4  Q1 Q2 Q3 Q4  Q1 Q2 Q3 Q4  Q1 Q2 Q3 Q4  Q1 Q2 Q3 Q4  Q1 Q2 Q3 Q4
Small Gas Turbine for SAT Demonstrator

- Technology for high efficient, high reliable small turboprop
Anti-Ice Demonstrator

- Innovative SAT low power electrical anti-ice system
Fly by Wire Ground Demonstrator

- Affordable FbW for SAT
Affordable future avionic solution for small aircraft, enablers for single pilot

Cockpit architecture

M1
KoM

TEP – Batch 1

M2

D1
D2
D3

Cockpit architecture - upd

M3

D4
D5
D6

TEP – Batch 2

M4

D7
D8
D9

Integration & Demo

M5

D10
D11

Final Assessment, Validation

M6

Q1 Q2 Q3 Q4

2016

Q1 Q2 Q3 Q4

2017

Q1 Q2 Q3 Q4

2018

Q1 Q2 Q3 Q4

2019

Q1 Q2 Q3 Q4

2020

Q1 Q2 Q3 Q4

2021

Q1 Q2 Q3 Q4

2022

TRL3

TRL4

TRL5

TRL6
Multifunction thermo-acoustics insulation of cabin for small aircraft
Advanced structural design of crashworthy configurable seats
SAT objective within System ITD is to research and develop application of cost effective technologies new generation small transport aircraft.

The main target is to achieve the high level objectives:

- Reduction of the Operational Costs
- Reduction of Total Maintenance Cost
- Improved Cabin (Noise, Thermal, Entertainment) & Flight comfort;
- Safety and Security.
To come

• A SAT workshop is scheduled 4 and 5th of February 2016 in Warsaw, Poland with main actors of the domain: airframers, airliners, certification authority, engine manufacturers, suppliers, etc..
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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