HYPSTAIR

Development and validation of hybrid propulsion system components and sub-systems for electrical aircraft

Funding: European (7th RTD Framework Programme)
Duration: Sep 2013 - Aug 2016
Status: Complete
Total project cost: €6,550,518
EU contribution: €4,368,499

Call for proposal: FP7-AAT-2013-RTD-1
CORDIS RCN: 110254

Objectives:

The HYPSTAIR project concerns the design of components of a serial hybrid propulsion system for small aircraft. A serial hybrid aircraft concept currently represents the best efficiency versus range compromise in the light aviation segment. It can be considered as an electrically powered aircraft, with an on-board generator used for extending the range when necessary. Limitations of current electric energy storage technology make an electric-only propulsion system as yet unsuitable for long range flying, therefore an on board ICE generator provides a weight efficient, if somewhat less energy efficient, power generation solution.

Methodology:

The project will involve conceptual design of the hybrid propulsion system components, namely the generator, motor, inverter, batteries and control unit. The components will be sized and designed by considering the performance and energy efficiency of the complete airframe-propulsion system, and will be tested in a laboratory environment. A dedicated human-machine interface will be designed that will allow simple operation of a complex hybrid system. Together with the reliability of electrical motors and the use of dual energy sources, safety of flying as provided by a system built upon these components will be improved.

All components will be designed in a way that they will meet the relevant safety and certification standards. As there currently exist no regulations for aviation hybrid drive systems, defining these in collaboration with the authorities will be an important contribution of the project, paving the way for hybrid and electric technologies to be introduced to the market. These efforts will help create a competitive supply chain for hybrid drive components and reduce the time to market of such innovations.

Parent Programmes:
FP7-TRANSPORT - Transport (Including Aeronautics) - Horizontal activities for implementation of the transport programme (TPT)

Institute type: Public institution
Institute name: The European Commission
Funding type: Public (EU)

Lead Organisation:

Pipistrel Doo Podjetje Za Proizvodnjo Zrancih Plovil

Address:
GORISKA CESTA 50A
5270 AJDOVSCINA
Slovenia
<table>
<thead>
<tr>
<th>Organisation Website:</th>
<th><a href="http://www.pipistrel.si">http://www.pipistrel.si</a></th>
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<tr>
<td><strong>EU Contribution:</strong></td>
<td>€1,645,200</td>
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**Partner Organisations:**

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<th>Website</th>
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<th>EU Contribution</th>
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<tbody>
<tr>
<td>M.b. Vision Di Pinucci Massimiliano</td>
<td></td>
<td>Via Armando Diaz 55, 56025 Pontedera Pi, Italy</td>
<td>Hybrid propulsion system components, Aircraft propulsion</td>
<td>€311,300</td>
</tr>
<tr>
<td>Universita Di Pisa</td>
<td><a href="http://www.unipi.it">http://www.unipi.it</a></td>
<td>N/a, 56122 Pisa, Italy</td>
<td>Hybrid propulsion system components, Aircraft propulsion</td>
<td>€248,792</td>
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<td>Univerza V Mariboru</td>
<td><a href="http://www.uni-mb.si">http://www.uni-mb.si</a></td>
<td>Slomskov Trg, 2000 Maribor, Slovenia</td>
<td>Hybrid propulsion system components, Aircraft propulsion</td>
<td>€465,207</td>
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<tr>
<td>Siemens Ag</td>
<td><a href="http://www.siemens.com">http://www.siemens.com</a></td>
<td>Wittelsbacherplatz 2, 80333 MUENCHEN, Germany</td>
<td>Hybrid propulsion system components, Aircraft propulsion</td>
<td>€1,698,000</td>
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**Technologies:**

- Aircraft propulsion
- Hybrid propulsion system components

**Development phase:** Research/Invention

**STRIA Roadmaps:** Transport electrification, Vehicle design and manufacturing

**Transport mode:** Air transport

**Transport sectors:** Passenger transport

**Transport policies:** Environmental/Emissions aspects, Decarbonisation
Geo-spatial type: Other