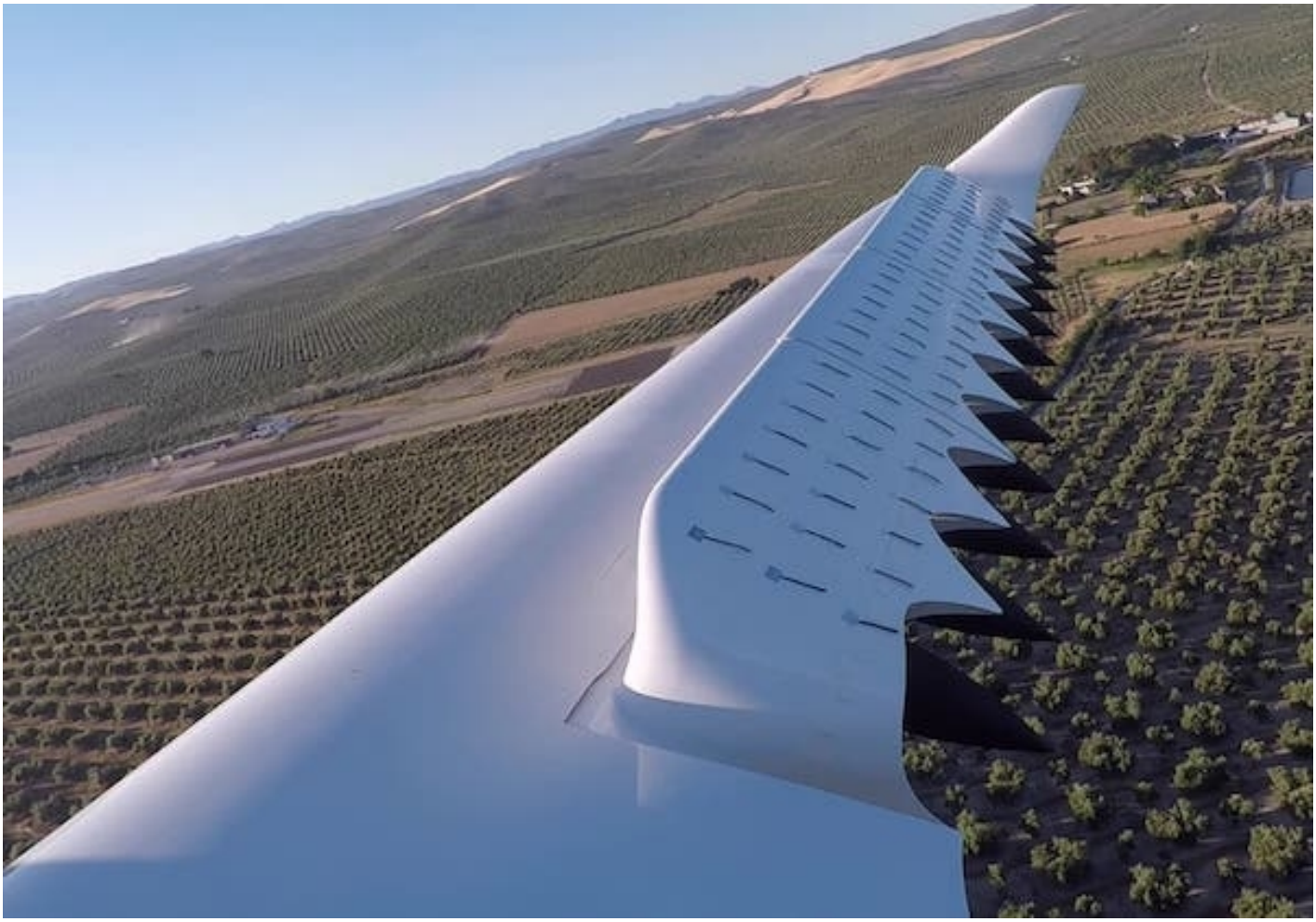
LILIUM - MAIN WING TRANSITION - BATTERY STRATEGY: PERFORMANCE AT SCALE

News / Business aviation, Manufacturer



Lilium technology demonstrator Phoenix 2 has achieved main wing transition. This means it is the first ever full-size electric jet aircraft to transition from hover to wing-borne flight. This is a landmark moment for Lilium and for electric aviation as a whole. From a flight physics perspective, completing transition means the airflow going over the flaps attaches and becomes smooth, allowing the lift to be generated by the wing (as in conventional fixed wing aircraft), rather than by the engines (which is the case during the hovering phase). Phoenix 2 has now achieved this milestone across the entire main wing while, most importantly, remaining stable and behaving as predicted by Lilium's proprietary Flight Dynamics Model.

Matthias Meiner, Phoenix Chief Engineer and Lilium Co-Founder of Lilium said: "Main wing transition is a huge step forward on our path to launch and it validates our Flight Dynamics Model. Full credit goes to the outstanding Lilium team who worked so hard to get us here, and who remain laser-focused on the rest of the Flight Test Campaign." Lilium will continue its Flight Test campaign throughout the summer, expanding the flight envelope further, including transition of the

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forward canards and high-speed flights.



Lilium is on a mission to create radically better ways of moving. With the unique zero operating emissions eVTOL jet technology, it is planed to transform high-speed regional air mobility. Core to the success of that revolution is the “e” in eVTOL – electric. And the foundation of technical and commercial success for any electric vehicle is inevitably the batteries that hold the energy to power them. While we’ve seen massive progress made in cell performance and industrialization over the last 15 years in everything from electric cars to consumer electronics, designing cells for the unique needs of the aviation industry has probably not been a priority.

Until now.

Lilium has been hard at work developing a high-performance aviation battery system for our jets centered on the two key drivers necessary to achieve our mission: performance and scale, while working towards anticipated certification requirements. Now that Lilium has progressed in filing patents to protect IP and independent 3rd party testing of its target cell technology has been completed, we can share more about our plans in this domain.

Based on this simple approach:

(i) identified and licensed unique cell technology available exclusively to Lilium in commercial regional eVTOL applications that we believe will meet our specific performance requirements and achieve over 250km of physical range; and

(ii) a manufacturing strategy and partner with the competence to build our cells on a scale that we believe will allow us to achieve our commercial and sustainability goals.

Performance: power and energy for the mission

Lilium team scouted more than 100 companies along the entire battery value chain from raw

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material suppliers through to cell developers, manufacturers, and recycling companies. More than 20 battery cells were shortlisted and analyzed considering the predicted mission profiles before selection of a specific cell technology.

Based on that research, Lilium concluded that Zenlabs' pouch cells, lithium-ion batteries using high-silicon anode and high-nickel cathode, offered the best solution for achieving our needs through performance, certification, and into scale production. Our engineers have been collaborating with the Zenlabs team for more than 2 years in order to develop and refine an optimal cell technology for the Lilium Jet.



For the past 18 months, the Lilium team has been working hand in hand with CUSTOMCELLS and our other industrial partners, establishing and testing processes, aligning Quality Management Systems to aerospace standards, monitoring implementation of series-production equipment, and preparing the industrial ramp-up. Initial production of our cells was started in February 2022, and we have prepared and are now working with CUSTOMCELLS to finalize the industrialization of the production processes following our detailed qualification and audit roadmap for the cell that will power our series production aircraft. We hope to share more news to come on this topic in the future.

From a certification and safety perspective, our cells and the battery modules into which they will be integrated, are being manufactured to meet both EASA and FAA anticipated safety regulations – to ensure both system redundancy as well as thermal runaway containment. On this last point, we have received detailed guidance from both regulators, which is the basis for our specific test campaigns.

Getting to scale requires more than manufacturing capability, it also is going to require scarce raw materials, such as lithium, nickel, manganese, and cobalt. Due to increasing demand for electric

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applications, especially in the mobility sector, these raw materials are becoming increasingly sought after. Ensuring our supply of key raw materials is therefore one of the key challenges facing the eVTOL industry.

As of today, we have contractual arrangements with our battery cell suppliers to provide sufficient quantities for us to deliver the first conforming aircraft and our initial production ramp up. We are currently looking to secure supplies further down the value chain. Over the past year, we have been engaged in very constructive discussions with major suppliers at various levels in the supply chain.

Most recently, Lilium and Livent – a pioneer in lithium technology innovation and production – have agreed to collaborate on the advancement of lithium metal technology for use in high-performance battery cells. This is an important step towards securing Lilium's future access to the high-performance battery cell technology that will power Lilium's jets.

But we also won't cut corners on our own values. Our goal is to avoid all use of raw materials from sources linked to armed conflict, human rights abuses, or child labor. As part of our sourcing strategy, Lilium requires that suppliers adopt a responsible minerals sourcing policy and that they respond to corporate social responsibility surveys to assess compliance down the supply chain.

In terms of recycling strategy, we are seeking through our partners second-life applications for used batteries as well as raw material recycling from our batteries (I.e. extraction back into original compounds) in order to be able to repurpose the majority of the materials we use in our batteries.

Looking further into the future, Lilium is also researching the potential for batteries that can be built without certain rare materials.



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03 JUNE 2022

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