



The Eco-Pulse technology demonstrator made its first flight on all electric power in December. [Courtesy of Daher]



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AIRCRAFT

Daher's Decarbonization Plans Drive Towards Hybrid-Electric Aircraft, Composites

As the French OEM and logistics giant reflects on 2023, it restructures for growth amid challenges faced by the global aerospace industry.

By [Julie Boatman](#)

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With an increasingly global workforce of 13,000 employees—up from 10,500 a year ago—and 1.65 billion euros revenue on top of three years of revenues stacked into the order book, Daher is poised to leverage the continued growth in its aerospace, industrial, and logistics segments. That is, if it can navigate the ongoing stresses on the global economy, including inflation, supply chain constraints, soft pricing models, and difficulty recruiting the talented workforce it needs to capitalize on opportunities and fulfill the order book it already has.

Daher's position demonstrates well the state of the global aerospace market.

"We are in a paradox situation—some are happy; some are not happy," said Patrick Daher, board chair for the Daher group, in kicking off the company's performance review for 2023 in Paris on February 7. "We are feeling the impact of the international situation, and then we are still recovering from COVID, but the COVID crisis is over for us...But some international threats—for example the war in Ukraine and the Middle East, the future elections, the situation in China—all these events have created a political instability that is really worrying for the future."



Patrick Daher

Chairman,
Board of Directors



Didier Kayat

Chief Executive Officer

Patrick Daher, board chair, and Didier Kayat, CEO, led Daher's annual press conference in Paris on February 7. [Courtesy of Daher]

Yet industry events such as the **2023 Paris Air Show** indicate where the future lies—with caution as to the expense of making change. “As chairman [of] the Salon de Bourget in 2023 and chairman of Daher...I have the chance to see that energy transition is coming with a really high price,” said Daher. “Speaking about industry, we have really good news in terms of an increase in production.”

In 2023, Daher recorded strong deliveries of both its TBM and Kodiak series turboprops, with a total of 56 TBMs and 18 Kodiaks, for a total of 76 units. In addition, it counts more than 100 turboprops in its order book, taking it well into 2025.

An Industry Overview

At the same time, major Daher client and partner Airbus has never manufactured so many aircraft—a record number went out the door in December, as Daher noted in the report. That is in spite of the constant pressures brought on by inflation, provisioning difficulties, recruitment challenges, rise in wages, and lowering margins. Collectively these have led to soft pricing models that have persisted through the past couple of years.

“We have forgotten how to deal with such problems of inflation that we experienced 20 years ago,” said Daher. “It was really hard to find raw materials, and this was linked to geopolitical problems, [such] as the war in Ukraine. We were missing material. This lack of raw materials is linked to the mismanagement of the supply chain—the suppliers failed to ship what we needed to manufacture our aircraft—and to produce what our clients asked us to do.”

Another problem Daher noted has been the lack of employee candidates. “It is not easy to recruit the right profiles...The COVID crisis changed behaviors in terms of wages and employees, so it is really hard for us to hire and find talents.” This **has driven companies like Daher** to invest heavily in training—because like never before they have had to recruit from outside the aviation industry.

“All these factors in 2023—after COVID, we were expecting 2021 and 2022 to be difficult—but these problems arrived in 2023,” Daher said. “All of these factors resulted in our weakened profitability. We need to consider the energy transition and the decrease in carbon intensity...2023 highlighted the emergency but also the [convergence], vis-à-vis the problem of decarbonization.”

The Daher group considers government support crucial—specifically CORAC, the French council for civil aviation research—and 300 million euros per year have been earmarked by CORAC to help fund the energy transition. “Aviation industry, all research efforts, have converged, because in the past each company focused on a specific research field, but right now there is a really clear target: low-carbon, low-emission aircraft,” Daher said.

Eco-Pulse Update

For the French OEM, the convergence flies today via its hybrid-electric Eco-Pulse technology demonstrator, which uses a TBM airframe, electric motors and powertrain components from Saran, and electric power storage by Airbus in a distributed lift model (simply put) to test various components and how they interact in actual flight operations. The Eco-Pulse retains a Pratt & Whitney PT6A turboprop engine, but **in December made its first flight segments** completely powered by the six electric motors.

“It is a major step towards decarbonization,” said Daher. “Because high voltage electricity can be a good solution...we are continuing with some hybrid tests. This is the first step...People thought I was crazy [last year] when I spoke about this target [to have a marketable product by 2027], but we are headed in that direction.” It will be a TBM or Kodiak because those are the models Daher has in its portfolio, but the company has yet to determine which will be chosen and exactly what that will look like.



The Eco-Pulse takes on a load of sustainable aviation fuel at Daher's Aircraft Division in Tarbes, France. All Daher aircraft operated on the SAF blend at its base in France. [Courtesy of Daher/World Fuel]

FLYING asked if the OEM could share any feedback—including any performance data, if possible—from those first flights. Christophe Robin, vice president of engineering for Daher's aircraft division, provided this insight: "EcoPulse is a technology demonstrator, therefore, aircraft performance is not the goal. The EcoPulse configuration has been chosen with the strategy of increasing the level of complexity in hybridization to develop a 'maturity picture' for all of the technologies involved—including examining side effects such as weight penalties, as well as issues induced by HIRF (high-intensity radiated field) and lightning."

Log'in, Shap'in, Fly'in

To support innovation efforts, Daher launched its second tech center, Log'in, in Toulouse, also geared toward decarbonization. "Out of 7 million tonnes [of carbon emissions] we realized that a big quantity is related to our clients, and we want to work on these figures [as well] in order to work on decarbonization," said Daher.

Fly'in will be the third tech center Daher launches, in Tarbes, focused on aircraft development, "stepping up" in both technology and the drive towards net-zero emissions.

FLYING also asked Daher to expand on the current projects that have already been realized from the new technology centers and Eco-Pulse. Robin shared a portion of what the group has learned thus far, and what it expects to benefit from.

"In addition to the aspects of EcoPulse that are linked to aircraft hybridization, another important focus is demonstrating the application of advanced composites on aircraft," said Robin. "Under the guidance of Daher's research and technology teams, EcoPulse is using composites for the aircraft's winglets, engine pylons, Karman and battery fairings, as well as the air inlet—which were produced primarily with an infusion-based carbon/cork micro-sandwich. A goal of EcoPulse is to make it possible to evolve the performance and feasibility of integrating these technologies on secondary parts/components of Daher-built aircraft, while developing rapid prototyping skills used within the aviation framework."

This is complementary to other developments underway at Daher—including projects in cooperation with partners such as CORAC (the French Council for Civil Aeronautical Research).

Pascal Laguerre, chief technology officer for Daher, provided significant insight beyond the Eco-Pulse demonstrator. “Taking a wider view for activities outside the framework of EcoPulse, Daher devotes a significant part of its overall R&D budget to thermoplastics,” said Laguerre. “This material is particularly promising in the world of aerostructures for future applications on production aircraft. It lends itself more easily to the automation of production (issue of throughput), and it is recyclable, repairable and weldable. Its mechanical properties make it possible to use less material and, overall, make structures lighter—all of which are key qualities with a view toward reducing carbon emissions. This is focused on accelerating the development of real applications in the future for the benefit of its customers, including [several more widely focused] projects.”

For example, as part of CORAC, Daher leads the largest French research project on thermoplastics in current execution, called TRAMPOLINE 2 (TheRmoplAstic coMPosites for hOrizontal tail plANE), as well as utilizing induction welding instead of riveting—with a weight savings of 15 percent.

Also, the investment has already borne fruit in components that will be found on the company's current TBM product lines.

"After more than three years of R&D work, Daher succeeded in manufacturing rudder pedals in recycled high-performance thermoplastic composites from production scraps to equip the TBM, which have been certified for flight on production TBMs," said Laguerre. "In addition to being lightweight, thermoplastics have low thermal conduction, as well as equal or better physicochemical and mechanical properties: It's a win-win for Daher customers. And beyond the environmental benefits, the cost of these parts is significantly reduced compared to metal machining.

"In addition, Daher has obtained the first results of an R&D project called CARAC TP, carried out in collaboration with a set of academic laboratories competent in composite materials. The objective [is] to identify and characterize the thermoplastic composites best suited to aeronautical applications and compare them to thermoset materials. The project makes it possible to study materials in depth through multiple tests that go beyond the scope of qualification programs carried out in the industry: impact resistance, fire resistance, environmental aging (ozone, UV, fluids), impact of manufacturing processes on physicochemical properties, material performance, etc."

Daher looks also outside its walls to new small businesses to help drive this innovation charge. Encouragingly, more than 300 aerospace-relevant startups took part in the Paris Air Show.

"We had 25 of these startups at the Daher stand at Le Bourget," said Daher, noting that the company looks forward to engaging with these innovators, perhaps through acquisition or collaboration, on various projects.

The Takeoff 2027 Strategy

Daher reported a strengthening bottom line but noted there is room for improvement. At the press conference, Daher CEO Didier Kayat indicated the belief that Daher would become profitable based on its strategic realignment to better serve four sectors: aircraft, industry, industrial services, and logistics. The company also plans a transformation of the organizational structure by 2025, to help align and draw down any existing silos between the business functions.

To this end, Daher made a quartet of additions to its executive committee in the later part of 2023. On October 1, Alain-Jory Barthe joined Daher's Industry division as senior vice president. Then, on January 1, Cédric Eloy became the head of the Industrial Services division as senior vice president of manufacturing services, and Julie de Cevins became the group's chief sustainability officer—a key appointment, given the group's charge to attain net-zero goals by 2050. Finally, on February 1, Aymeric Daher became senior vice president of the Logistics division.

Daher is adapting its organization to support the four business units, with the following actions:

- To create a managerial culture that is based in what it calls the “Daher Leadership Model”—effectively empowering a cadre of 1,500 leaders within the company to act with an entrepreneurial spirit
- To anticipate challenges and innovate toward decarbonisation solutions, with Eco-Pulse among other projects
- To support the acquisitions needed for growth across the four sectors.

Acquisitions have already borne fruit for the company, including the Stuart, Florida, facility.

“The acquisition of AAA strengthened the Industrial Services division, for example,” Daher said. “We are now the leader of industrial services...We can support aircraft manufacturers in peak periods.”

If Daher can make its way through the concurrent challenges of acquisition-driven growth, corporate restructuring, price pressures, and order fulfillment, its plan for the years ahead puts it on track to form part of the global solution to decarbonization—as well as providing the aircraft the customer demands for the future.

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INDUSTRY

INDUSTRIAL
SERVICES

LOGISTICS



Daher's corporate entity is restructuring into “4 métiers” or business units to better align to its Takeoff 2027 strategy. [Courtesy of Daher]

DAHER



TBM 960 **DIGITAL POWER**

Our latest TBM very fast turboprop aircraft delivers the full benefits of digital power. Taking maximum advantage of today's turboprop technology, the single-engine TBM 960 provides high efficiency for more sustainability. In its Prestige cabin, passengers regulate temperature and ambient lighting with exactitude. Featuring outstanding safety systems such as the TBM e-copilot® and HomeSafe™ emergency autoland, the TBM 960 is the quintessential TBM.

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