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## **The Industry's New Goals: Redefining the Path to Net-Zero**

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To achieve the aviation industry's net-zero emissions goal by 2050, the industry narrative must shift dramatically. In this article for Impact, new propulsion aircraft developer Heart Aerospace argues for a fundamental rethinking of how the industry approaches its net-zero challenge – from investing in innovative production processes to fostering increased collaboration.

The aviation industry is rapidly approaching a crossroads, where its growth ambitions clash with the urgent need for decarbonization. By committing to net-zero carbon dioxide (CO<sub>2</sub>) emissions by 2050, airlines and aircraft manufacturers have acknowledged the need for action in the face of an unfolding climate crisis. But there is a troubling disconnect between these commitments and the reality of current industry practices.

A study by the International Council on Clean Transportation (ICCT)\* paints a stark picture. According to this research, the global fleet already in service today is projected to emit about 9 billion tonnes of CO<sub>2</sub> before these aircraft are retired, consuming almost half of the remaining net-zero carbon budget for the aviation industry. Perhaps more alarming, under the most optimistic scenarios, which assume significant advances in sustainable aviation fuels (SAFs) and fuel efficiency, emissions from new aircraft delivered up to 2042 will exhaust the remaining carbon budget by 2037.

These findings reveal that the industry's narrative—focusing on incremental improvements and small efficiency gains as credible paths to net-zero—is misleading, creating a false impression that current emission-reduction efforts will suffice when current delivery projections fall far short of the 2050 net-zero emissions goal. As an industry, we need to move beyond this limited narrative and begin discussing the comprehensive transformation required in aircraft design, production, and operation to achieve meaningful change.

The pace of innovation in aerospace must match that of the automotive and space industries if the industry's net-zero goal is to be achieved. If electric cars and reusable rockets can make leaps in just a few years, so too can aviation.

Heart Aerospace's hybrid-electric ES-30, for instance, represents the kind of innovation that could play a pivotal role in transforming regional air travel. For routes up to 200 km, it virtually eliminates emissions. Even on longer flights, it achieves substantial fuel savings compared to the most efficient turboprops. And these figures are just the beginning— as battery technology advances, the ES-30's zero-emission range will continue to improve. The aircraft's batteries will be replaced every two years, further enhancing its environmental impact.

By offering lower operating costs compared to conventional fuel-powered planes, electric and hybrid-electric aircraft present a major opportunity for regional aviation. However, while this is a promising step forward, it only begins to address the industry's broader decarbonization challenges.

**The ICCT report estimates a market for at least 10,000 zero-emission planes (ZEPs) by 2042.**

The ZEP challenge is not just about developing new technologies—it's also a manufacturing challenge. Companies must invest in production processes that can scale up rapidly to deliver these advanced aircraft in time to make a real impact.

Heart Aerospace has embraced this challenge by recently unveiling its first full-scale demonstrator airplane, the Heart X1, a key milestone in the development of the ES-30. Built almost entirely in-house at Heart's Gothenburg facilities, the demonstrator reflects the company's strategy of integrating design and production processes closely. This approach is critical for those introducing groundbreaking technologies like electric propulsion. A tightly integrated development process allows for rapid learning, risk-taking, and fast problem-solving, which are essential to driving technological advancement.

Drawing on its experience with the Heart X1, Heart is now focused on building a state-of-the-art aircraft manufacturing process to support the development of the ES-30, with a data-driven assembly line that prioritizes automation, high repeatability, and non-destructive inspection. The next step in the development of the ES-30 is the creation of the pre-production prototype, the Heart X2, which will further refine both the aircraft design and the production methods, ensuring the rapid deployment of next-generation aircraft.

However, this transformation cannot happen in isolation. Achieving the net-zero goal will require unprecedented collaboration between airlines, manufacturers, governments, and regulatory bodies. Without this collective effort, the aviation industry risks not only failing to meet its climate targets but also losing its social license to operate in an increasingly carbon-conscious world. The aerospace industry has always been a leader in technological innovation. Now, it must harness that pioneering spirit to address its greatest challenge: creating a sustainable future for aviation.

Only by abandoning the illusion of incremental change and embracing bold transformation can the industry reach its net-zero goals by 2050.

\* [Lifetime emissions from aircraft under a net-zero carbon budget - International Council on Clean Transportation \(theicct.org\)](https://www.theicct.org/)