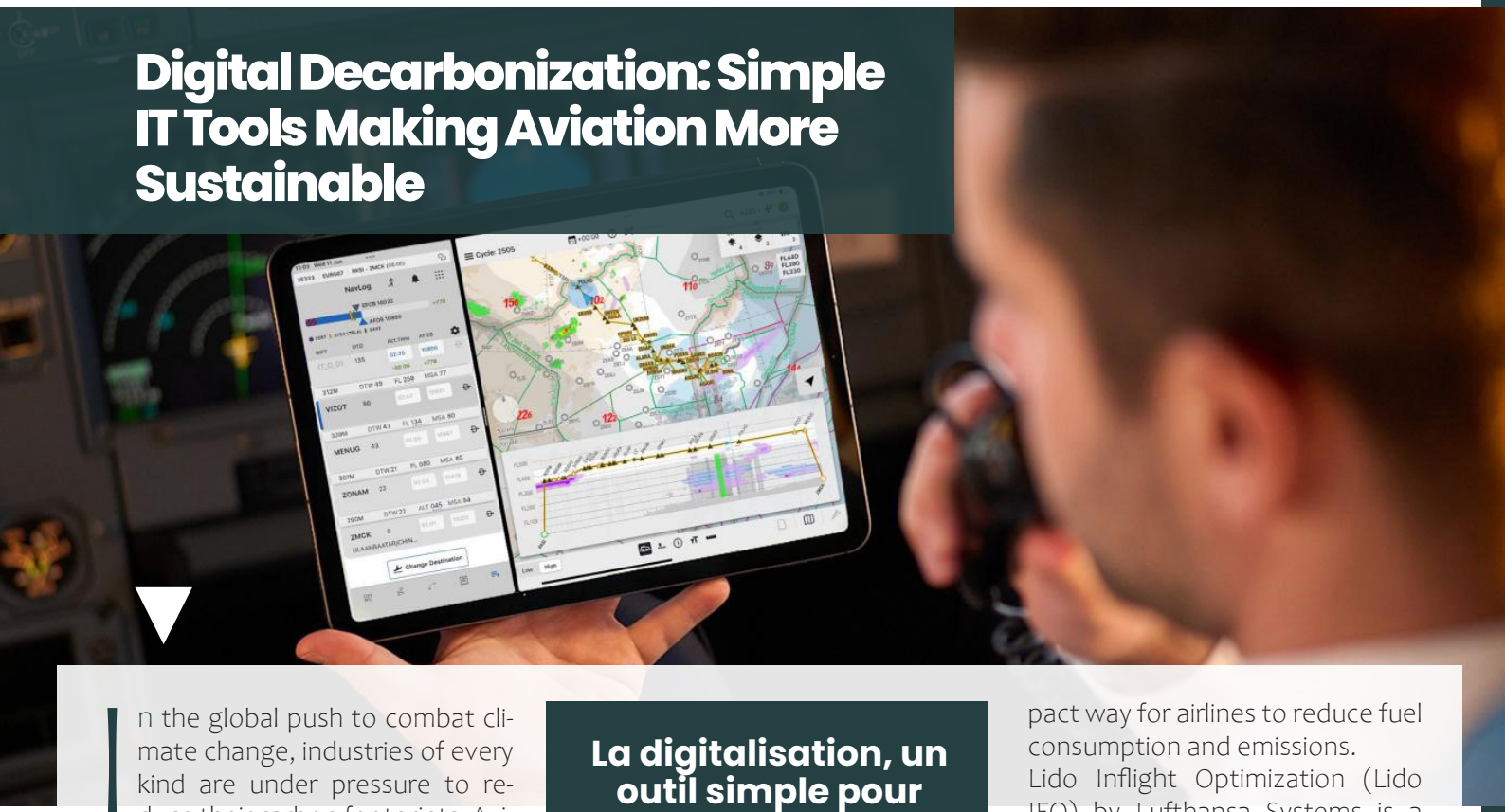
Digital Decarbonization: Simple IT Tools Making Aviation More Sustainable



In the global push to combat climate change, industries of every kind are under pressure to reduce their carbon footprints. Aviation, contributing approximately 2–3% of global CO_2 emissions, has long been recognized as a sector where change is both necessary and complex.

Moreover, with the aviation industry under increased pressure from regulators, investors, and climate-conscious passengers, demonstrating real progress in emissions reduction is no longer optional—it's a competitive necessity.

Africa's aviation sector, in particular, is growing rapidly, with passenger demand up 14.9% each year and strong forecasts predicting an average annual growth of 4.2% through 2043.

Major initiatives—like sustainable aviation fuels, next-generation aircraft, and more efficient engines—are already in progress but often require years of investment and planning.

However, there's a surprisingly simple and available solution that offers immediate impact with minimal disruption: Inflight Optimization

As a software-based approach, it provides a low-threshold, high-impact way for airlines to reduce fuel consumption and emissions.

Lido Inflight Optimization (Lido IFO) by Lufthansa Systems is a prime example of how small digital interventions can produce relevant environmental and financial results.

Without the need for physical modifications to aircraft or infrastructure, such innovations empower airlines to reduce emissions simply by flying smarter.

Lido IFO works by providing real-time vertical trajectory optimization for flights already enroute. While traditional flight planning involves calculating a trajectory before departure based on expected conditions, the reality of air travel is much more fluid.

Conditions often change after pushback—due to weather, air traffic flow restrictions, or NOTAMs—and these changes can cause the original flight plan to become suboptimal. When that happens, pilots are left to make decisions based on outdated data, inevitably leading to fuel inefficiencies.

This is where real-time inflight optimization makes a difference. By using current data to suggest improved vertical flight profiles while the aircraft is enroute, such

La digitalisation, un outil simple pour réduire l'empreinte carbone de l'aviation

Face à la pression croissante des régulateurs, investisseurs et passagers, l'aviation doit accélérer sa transition vers plus de durabilité. Si les biocarburants durables, les nouveaux avions et moteurs sont des solutions prometteuses, elles nécessitent des années d'investissement. En attendant, des outils numériques simples peuvent offrir des gains immédiats et mesurables.

C'est le cas de Lido Inflight Optimization (Lido IFO), développé par Lufthansa Systems. Ce logiciel optimise en temps réel la trajectoire verticale des avions en vol, en tenant compte des conditions réelles (météo, restrictions de trafic, NOTAM). Contrairement aux plans établis avant le départ, il permet aux pilotes d'adapter leurs décisions avec des données actualisées, sans charge de travail supplémentaire ni modification matérielle des appareils.

Les résultats sont concrets : une économie moyenne de 0,55 % de carburant par vol, soit environ 550 kg économisés sur un long-courrier consommant 100 000 kg de car-

systems help crews make more informed decisions without additional workload. Optimization suggestions are delivered via familiar communication channels, require no new aircraft hardware, and are aligned with existing operational and regulatory frameworks. The result is a streamlined path to better performance which is integrated into the natural flow of flight operations.

Most importantly, these recommendations are not just theoretical. They are instantly usable, compliant with regulations, and tailored to the specific flight plan and aircraft configuration. This ensures pilots can confidently implement them without hesitation. At the same time, dispatch and operations teams are kept in the loop via the Lido Flight 4D interface, where all calculations are displayed in real time, offering full transparency into how the system operates.

Airline case studies have shown that implementing Lido IFO can lead to fuel savings starting at 0.55% of trip fuel. While that might seem like a small percentage, the scale of modern aviation transforms it into something truly significant. Consider a typical long-haul flight that uses around 100,000 kilograms of fuel. A 0.55% saving means 550 kilograms of fuel conserved—on just one flight. Across a fleet operating thousands of flights annually, this can amount to millions of kilograms of fuel, and a corresponding reduction in CO_2 emissions.

For every kilogram of jet fuel burned, roughly 3.16 kilograms of CO2 are emitted. These calculations clearly demonstrate the environmental benefits.

These benefits are particularly attractive for African carriers operating in cost-sensitive environments where every kilogram of fuel counts—especially given that fuel prices in the region can be up to 30% higher than the global average. This is largely due to limited infrastructure and high transport costs for fuel imports (Source: IATA 2024, Chart of the Week).

burant. À l'échelle d'une flotte, cela représente des millions de kilogrammes de kérosène et des milliers de tonnes de CO_2 évitées.

Pour les compagnies africaines, où le carburant coûte jusqu'à 30 % plus cher que la moyenne mondiale, ces technologies représentent un levier stratégique. Accessibles, rapides à déployer et conformes aux normes, elles permettent d'améliorer la compétitivité tout en contribuant aux objectifs mondiaux de décarbonation.

This is where advanced operational technologies—particularly automation—become relevant. Optimizations are continually recalculated using the original flight plan's constraints and logic. Automation reduces workload for pilots and dispatchers and ensures consistency across the fleet. The system flags improvements only when they meaningfully enhance efficiency, allowing crews to act at precisely the right moment.

Flight efficiency isn't just a technical matter—it's increasingly a strategic one. Due to the growing pressure from regulators, investors and passengers, tools that help quantify and report real progress are becoming essential. Inflight optimization stands out here, offering an easy-to-adopt, data-backed solution that delivers measurable environmental and cost benefits.

The simplicity of implementation is a major advantage. As a software-based solution, inflight optimization doesn't require physical changes to aircraft or downtime for installations. It leverages existing systems and communication methods, making it accessible even to operators with limited technical resources. With so many decarbonization technologies still years away from large-scale viability, low-barrier digital tools fill an important gap.

Although the aviation industry is actively pursuing long-term structural changes, there is a clear opportunity today to reduce emissions through smarter operational practices. Lido IFO demonstrates how digital intelligence applied in the cockpit can enhance outcomes for both the environment and profitability. Rather than waiting for large-scale technological breakthroughs, airlines can begin reducing emissions now with tools that are already proven, already available, and surprisingly easy to adopt. Inflight optimization is not a silver bullet—but it is a smart, scalable step toward more sustainable skies.

By embracing solutions that are already available and working, particularly African airlines can improve efficiency, reduce costs, meet international environmental standards, and build the foundations for a more sustainable aviation future.