



THE ROLE OF AIRLINE LOYALTY PROGRAMMES IN ADDRESSING CLIMATE CHANGE

Abstract

Aviation faces growing pressure to decarbonise while continuing to support global commerce and business travel. This article examines how airline loyalty programmes can evolve from traditional engagement tools into scalable mechanisms for climate action. It explores why loyalty programmes are uniquely positioned to influence emissions-intensive travel decisions. In pursuing the understanding of operationalising lower-carbon flying at scale, we see how carbon-tracking airline loyalty capabilities, Sustainable Aviation Fuel (SAF) integration, and airline carbon offset programmes help. Drawing on recent industry benchmarks, technology design patterns, and real-world examples, the article outlines how loyalty platforms can translate climate ambition into measurable behaviour change. It also addresses the structural accountability gap in current loyalty models and shows how modern enterprise architectures and incentive redesign can align commercial performance with aviation's net-zero goals.



Air transport is at a crossroads. On one hand, aviation connects economies, enables global commerce, and powers modern business travel; on the other, it accounts for about 2.5% of global CO₂ emissions and is recognised as one of the most difficult sectors to decarbonise. Airlines are increasingly introducing carbon offset options and sustainability-linked incentives within loyalty programmes,

highlighting their ability to influence travel behaviour at scale.

For technology leaders shaping the next generation of airline loyalty platforms, this shift creates a concrete opportunity. By embedding carbon tracking airline loyalty capabilities and integrating airline carbon offset programmes and Sustainable Aviation Fuel (SAF) participation, loyalty systems can extend beyond traditional

engagement. Aligning rewards with lower-emission choices then allows these platforms to actively support sustainable aviation. When emissions data, incentives, and redemption options are surfaced at the point of booking and travel, loyalty programmes can guide travellers on how to fly more sustainably, turning everyday decisions into measurable climate outcomes.

Why loyalty programmes matter for aviation decarbonisation

Aviation decarbonisation counts on influencing millions of individual travel decisions that collectively determine emissions outcomes, and loyalty programmes sit at the centre of those choices. They shape carrier selection, cabin class, travel frequency, and ancillary purchases, all of which directly affect carbon intensity. What sets loyalty

programmes apart from standalone sustainability initiatives is the persistence of the customer relationship.

By retaining longitudinal data on travel behaviour, preferences, and status, loyalty platforms enable airlines to engage travellers repeatedly over time rather than through one-off sustainability prompts.

From a systems perspective, this makes

loyalty a scalable foundation for integrating carbon awareness into commercial decision-making. Because rewards, status, and recognition already shape perceived value, loyalty frameworks can incorporate climate considerations without changing fundamental behavioural models, allowing airlines to align decarbonisation goals with core business objectives

How loyalty programmes enable lower-carbon flying

Loyalty programmes enable lower-carbon flying through three complementary mechanisms:

Carbon intensity benchmarks powering loyalty tools

Industry targets to reduce fuel carbon intensity, including [an expected improvement of around 5% by 2030](#), give airlines a clear way to measure progress. These benchmarks enable the comparison of emissions across different routes, aircraft types, and cabin classes, providing a practical basis for building carbon-aware loyalty features.

Airlines can embed carbon-tracking airline loyalty features into booking and post-booking experiences, allowing travellers to see emissions associated with specific itineraries and seating choices. When loyalty rewards are linked to these metrics, abstract climate targets become personalised signals that guide decisions

on how to fly more sustainably through transparent, data-driven incentives.

Bridging SAF demand gaps with loyalty mechanisms

SAF is widely recognised as a cornerstone of aviation's decarbonisation pathway, yet limited supply and high costs continue to constrain adoption. Industry analysis highlights the need for predictable, long-term demand signals to support investment: a gap that loyalty programmes can help address by aggregating individual traveller actions into visible programme-level demand.

For example, loyalty programmes can help group together individual traveller actions, such as using miles to support SAF or choosing fares that include blended fuels. When combined with approaches like book-and-claim, this can give airlines clearer signals about customer interest

in SAF and support more informed fuel supply planning over time.

Elevating airline carbon offset programmes via loyalty

Carbon offsets remain a transitional tool as aviation shifts toward fuel-based decarbonisation, but their effectiveness depends on participation, transparency, and trust. Loyalty integration strengthens all three.

When airline carbon offset programmes are built into loyalty platforms, travellers can see verified offset options during booking, earn miles or tier credits for taking part, and receive clear summaries showing how offsets relate to their own travel. This integration moves offsetting from an optional add-on to a repeatable behaviour, supporting credible and transparent pathways to lower-carbon flying.



Architecting green loyalty: an enterprise technology stack

Airlines need composable, enterprise-scale architectures that integrate sustainability tracking with loyalty and personalisation. Modular, API-driven design allows airlines to introduce features such as SAF contributions and carbon-aware rewards quickly, without disrupting core systems. This architectural approach forms the foundation on which sustainability use cases can be built and scaled across large loyalty ecosystems.

Foundational data layer

A unified data layer consolidates customer profiles, transaction histories, and engagement data into a single view of the traveller. This architecture supports the ingestion of additional datasets, such as emissions metrics, green fare selections, and offset activity, enabling consistent carbon accounting and near-real-time insight without restructuring core systems.

Core loyalty and rules engine

A modular loyalty engine allows earning, redemption, and sustainability rules to evolve independently of passenger service

systems. Configurable rules enable airlines to introduce emissions-based incentives, SAF-linked rewards, or green fare logic without large-scale re-platforming, improving responsiveness to regulatory and market change.

Data-driven personalisation

Advanced analytics can be applied to loyalty data to optimise engagement by balancing customer lifetime value with participation in lower-emission choices. By analysing travel behaviour and response patterns, airlines can tailor incentives that increase uptake of sustainable options while maintaining commercial performance.

Sustainability and partner integration

Open integration layers allow loyalty platforms to connect with external partners such as offset providers, SAF suppliers, and multimodal operators. Emissions calculations can feed enterprise ESG reporting systems, while distributed ledger technologies are increasingly used to provide auditable records for SAF and

offset transactions and reduce the risk of double-counting.

Deployment, security, and modernisation

Enterprise loyalty platforms typically operate across hybrid and multi-cloud environments and require strong security controls. Zero-trust security models and modern delivery pipelines help protect high-value loyalty assets, support controlled experimentation such as A/B testing of incentives, and enable phased modernisation alongside legacy Passenger Service System (PSS) and loyalty systems.

Business Case: Airlines that invest in loyalty programmes can scale these systems to millions of members with measurable business impact. Well-designed loyalty tools also drive retention and deeper engagement. These outcomes correlate with improved revenue and customer lifetime value.

Loyalty's climate accountability gap

Airlines have invested heavily in sophisticated loyalty platforms that can rapidly deploy sustainability features, yet many programmes remain constrained by legacy incentive design. Most loyalty schemes continue to reward higher flight frequency and spend rather than lower-emission choices, reinforcing behaviours such as premium cabin upgrades and "mileage running" trips that materially increase emissions. Qualifying for elite tiers can require [annual carbon emissions of between 5.6 and 92.8 tonnes](#), roughly 7 to 112 times the average UK air travel footprint, effectively concentrating a disproportionate share of aviation's carbon

impact among a small cohort of frequent flyers.

Current green loyalty features, including SAF contributions and carbon offsets, do not fully address this structural issue. When layered onto volume-based reward models, they risk being perceived as incremental add-ons rather than drivers of meaningful change, increasing exposure to regulatory scrutiny and greenwashing concerns. To close this gap, airlines need to reconfigure reward engines to prioritise carbon efficiency. For example, by awarding bonus points for economy seating, which can emit up to five times less CO₂ than business class, or for flights supported by cleaner,

sustainable aviation fuel.

This shift aligns not only with climate objectives but also with evolving customer expectations. A growing majority of travellers report that sustainability influences their travel decisions, with [more than 80% indicating that environmental impact matters to them and over 90% expressing a desire to make more sustainable choices](#). For airlines, redesigning loyalty incentives around carbon efficiency is therefore as much a commercial and technology challenge as it is a sustainability imperative.



Bridging the climate accountability gap with technology

The accountability gap in today's loyalty programmes is not caused by a lack of digital capability. The gap exists because incentive structures have not kept pace with what technology now makes possible. This is where technology becomes the enabling force for redesign:

- **Lower-carbon itinerary surfacing and emissions comparison**
Digital tools can surface lower-emission routes and itineraries by default, compare CO₂ across travel options, and apply behavioural nudges that guide travellers toward greener choices without requiring manual search.
- **Blockchain-based SAF tracking and transparency**
Blockchain systems are being used to track SAF purchases, issue digital certificates, and provide auditable records that demonstrate how SAF

contributions are funded and applied, strengthening transparency and trust.

- **Carbon-aware rewards and cabin-based incentives**
Premium cabins can [generate five times higher emissions per passenger than economy seating](#), supporting the case for differentiating loyalty rewards based on carbon efficiency rather than spend alone.
- **Passenger-facing climate dashboards and reporting**
Some airlines now provide climate dashboards that allow travellers to track CO₂ emissions over time, link emissions to individual trips, and better understand the impact of their travel choices within a single view.
- **Security, fraud prevention, and loyalty platform integrity**

As loyalty ecosystems grow more complex, zero-trust security models and AI-driven fraud detection are increasingly recommended to protect high-value rewards, member data, and transaction integrity.

- **Composable architectures for rapid sustainability innovation**
MACH and composable architectures enable airlines to integrate booking, loyalty, data, and sustainability partners, allowing new green incentives and features to be configured and deployed quickly without disrupting core systems.

The result proves powerful: airlines profit from premium green fares while achieving real emissions cuts, and passengers fly the same amount but significantly greener automatically. Technology removes the behaviour change barrier entirely.



Make loyalty work for aviation's net-zero goals

For airline leaders navigating the transition to lower-carbon operations, loyalty programmes represent an underused but highly scalable lever for change. Unlike fuel innovation or regulatory reform, loyalty

systems already operate at the intersection of customer behaviour, commercial incentives, and digital execution. By embedding carbon visibility, SAF participation, and verified offset pathways

into loyalty journeys, airlines can translate climate ambition into repeatable customer action without undermining demand.

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