Case Study: Scope 3 Emissions from Mid-Lease Inspections

Abstract

This case study evaluates the carbon emissions generated from mid-lease aircraft inspections conducted by aviation lessors over a calendar year. Using real travel and logistics data across multiple global regions, the analysis focuses on emissions arising from flights, ground transport, and accommodation. These activities fall within Scope 3, Category 6 (Business Travel) under the GHG Protocol. Findings underscore the materiality of emissions from routine asset management tasks and present opportunities for operational and environmental efficiencies. The total emissions observed across all inspections were translated into an offset benchmark using tree-based sequestration equivalents.

Introduction

Aircraft leasing companies frequently conduct mid-lease inspections to verify asset condition, contractual compliance, and maintenance quality. These inspections typically involve international travel by technical representatives and consultants. While necessary for asset protection and relationship management, the associated travel and logistics contribute to the lessor's carbon footprint.

This study reviews a full year of mid-lease inspections carried out by a cross-section of lessors and evaluates their environmental impact. The goal is to quantify Scope 3 emissions from these technical events and promote data-driven sustainability practices within aircraft leasing operations.

Scope and Objectives

This case study aimed to:

- 1. Quantify Scope 3, Category 6 emissions from flight, road travel, and accommodation during mid-lease inspections.
- 2. Provide a multi-client, multi-region snapshot of real-world emissions behavior.
- 3. Convert emissions into relatable environmental benchmarks using tree absorption equivalents.
- 4. Offer actionable insights for emissions reduction and sustainability leadership.

Methodology

Data Collection:

- Activity data was sourced from internal inspection logs covering global clients and regions.
- Each inspection event captured:
- Flight distance estimates (inferred from cost data and location)
- Consultant base locations and destinations
- Nights spent in hotels (HOTAC)
- Use of rental or private cars
- Region of inspection

Emissions Calculation:

- DEFRA 2023 emissions factors were applied to travel and accommodation activities.
- Estimated CO2e was derived for each emission source:
- Flights (short-haul, long-haul, or domestic as inferred)
- Car travel (assumed standard petrol or diesel cars)
- Hotel stays (based on region-specific energy consumption averages)

Offset Equivalency:

- Based on EcoLab's benchmark of 25 kg CO2 absorbed per tree per year, the number of trees required to offset total emissions was calculated.

Key Findings

1. Emissions Profile:

- Total emissions varied widely by inspection, ranging from <500 kg CO2e for regional European visits to over 2,000 kg CO2e for long-haul inspections in North America, Africa, and Asia.

- Flights were the dominant contributor, followed by accommodation and road travel.

- 2. Regional Differences:
- North American inspections had the highest emissions due to long distances and fewer direct flight options.
- European inspections were less carbon-intensive but more frequent.
- Africa and Asia inspections contributed disproportionately due to longer duration and increased hotel usage.

3. Offset Requirements:

- Some individual inspections would require up to 80 trees to offset associated emissions.
- On average, each mid-lease inspection required the carbon absorption capacity of 25-35 trees.

Discussion

This analysis illustrates the hidden carbon cost of ongoing asset management in aircraft leasing. Mid-lease inspections, while essential for technical and contractual oversight, contribute to an emissions profile often overlooked in sustainability reporting.

For lessors with global fleets, these emissions multiply quickly over the course of a year. Yet, they also present clear opportunities for emissions reductions, including:

- Consolidating inspections across fleets or regions
- Prioritizing local inspectors or hubs to minimize air travel
- Incentivizing low-emissions travel modes (e.g., rail, carpooling)
- Offsetting inspection emissions with verified reforestation projects

Conclusion

Routine mid-lease inspections represent a meaningful and measurable source of Scope 3 emissions in aviation leasing. This case study demonstrates the value of emissions transparency and the use of operational data to support carbon accounting.

By recognizing emissions from business travel as a formal part of their sustainability strategy, lessors can lead the way in climate-responsible asset management. Oak Tree ESG supports lessors in calculating, reporting, and reducing emissions from technical events throughout the lease lifecycle - helping the industry progress toward net-zero goals with clarity and credibility.