



# Project Blue Sky: Economic Impact of Sustainable Practice in the Airline Industry

**Industry**  
**Caleb Kroeger, Neil Wilmot**

Department of Economics, University of Minnesota, Duluth USA 55812

## Introduction

Sustainability is our society's ability to exist and develop without depleting all of the natural resources needed to live in the future. The airline industry accounts for 12% of all CO<sub>2</sub> emissions produced per year ATAG (2024). I am directing my interest towards the economic impact of sustainable practices within the airline industry. Fueling expenses, asset investment outcome, and consumer behavior all influence the overall success of businesses within the airline industry.

## Proposed Business Plan

The comprehensive data collection methods, including case studies, financial modeling, and market analysis, are expected to yield valuable insights into the economic implications of sustainability in the airline industry. By examining specific airlines' experiences with implementing sustainable practices, analyzing financial performance before and after adoption, and quantifying the financial impact of green technologies through discounted cash flow modeling, the study aims to provide airlines with actionable recommendations for optimizing their sustainability strategies. Additionally, by identifying demographic characteristics and psychographic traits of eco-conscious passengers and analyzing overarching trends in sustainable air travel, the research seeks to highlight revenue growth opportunities and brand value enhancement associated with catering to this growing segment of environmentally conscious travelers. Ultimately, the expected business case outcome is to demonstrate the business value of prioritizing sustainability initiatives, balancing environmental responsibility with financial performance, and positioning airlines for long-term success in a rapidly evolving industry landscape.

## Procedure

**Cost Benefit Analysis:** Conducting a cost-benefit analysis (CBA) of electric ground support equipment (GSE) involves assessing the costs of implementation, loss of gas powered infrastructure, and regulatory maintenance. This analysis helps airlines make informed decisions about GSE implementation and supports sustainable aviation practices.

**Financial Modeling:** Using financial statements from Delta Air Lines, this discounted cash flow (DCF) model estimates the value of an investment by discounting future cash flows to present value, enabling the calculation of net present value (NPV) and return on investment (ROI). This model is useful for evaluating investments in sustainable aviation fuel.

**Market Analysis:** Market analysis involves identifying eco-conscious passengers' demographic and psychographic traits while analyzing industry trends in sustainable air travel. It also compared ten of the largest airlines in the world, scoring based on their participation in the most common sustainable trends. This helps assess the growth of eco-friendly airlines, carbon-neutral initiatives, and the adoption of green technologies.

## Procedure Cont.



Figure 1. Procedure timeline.

## Results

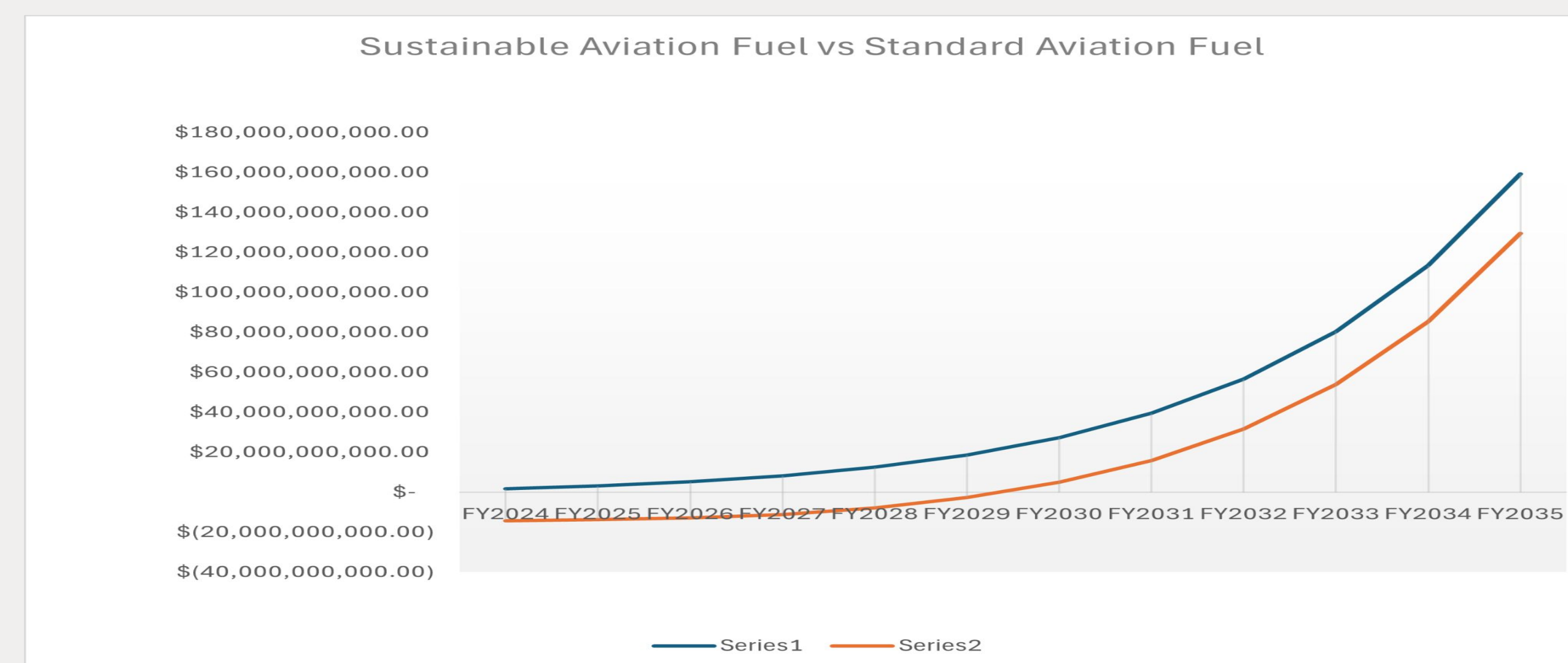


Figure 2. Net Income With Implemented Sustainable Aviation Fuels

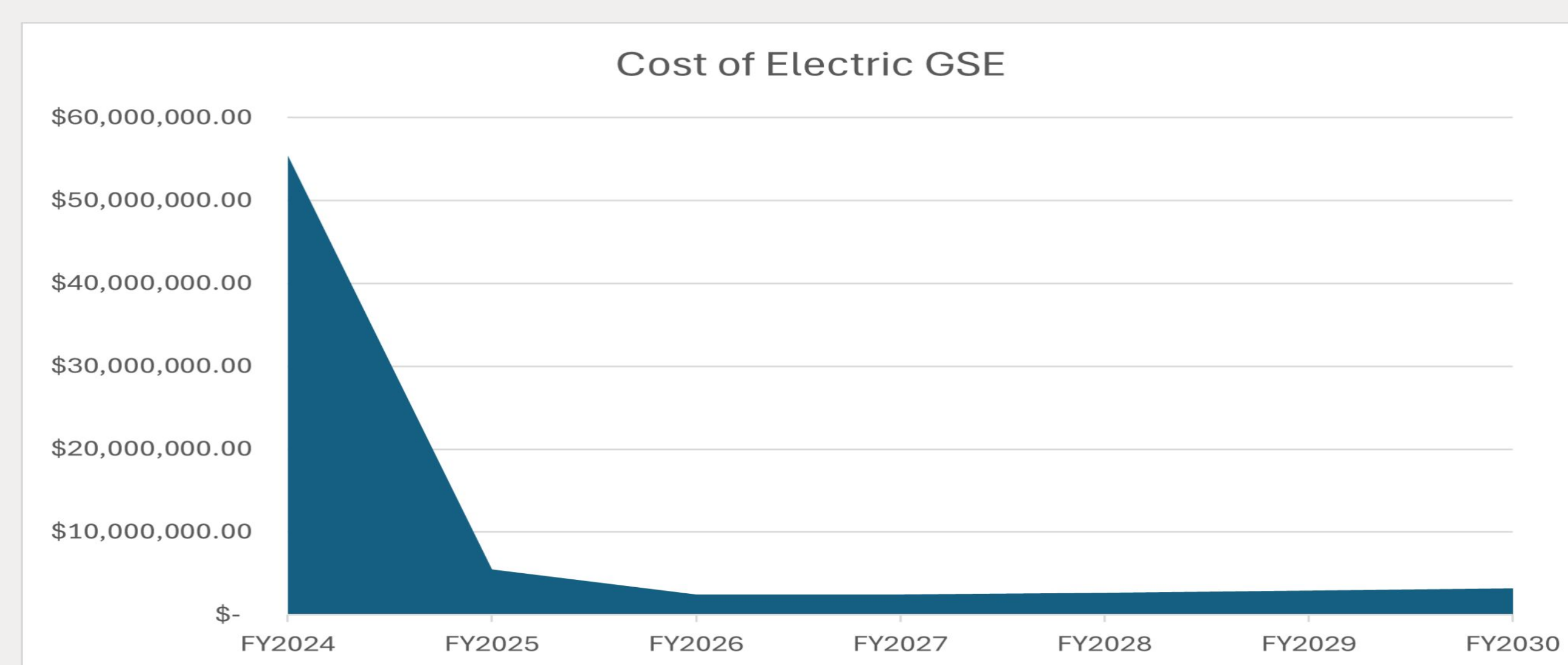


Figure 3. Cost Benefit Output of Implementing Electric Ground Support Equipment

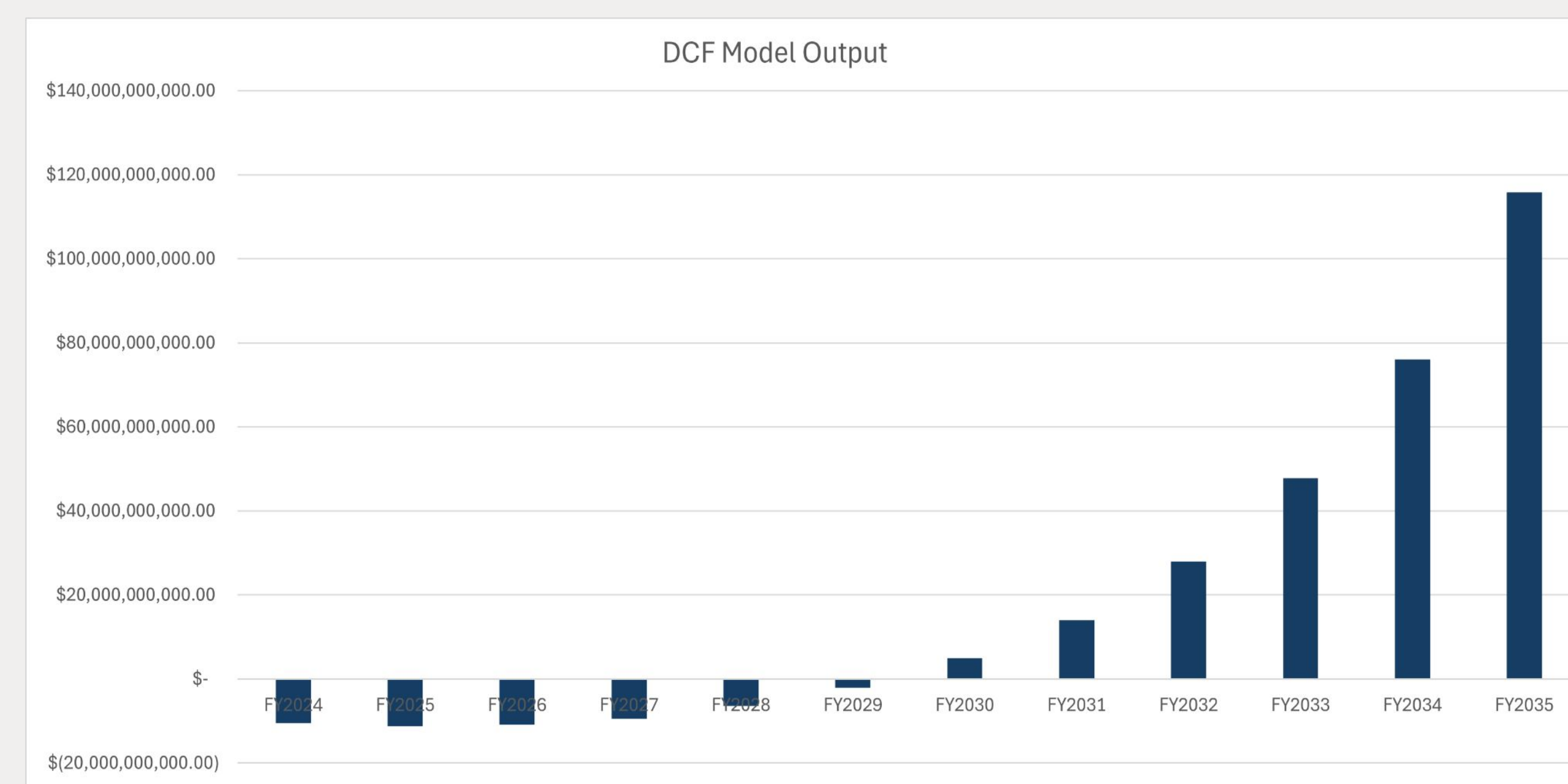


Figure 4. Discounted Cash Flows Output Over 5 Year Period

## Results Cont.

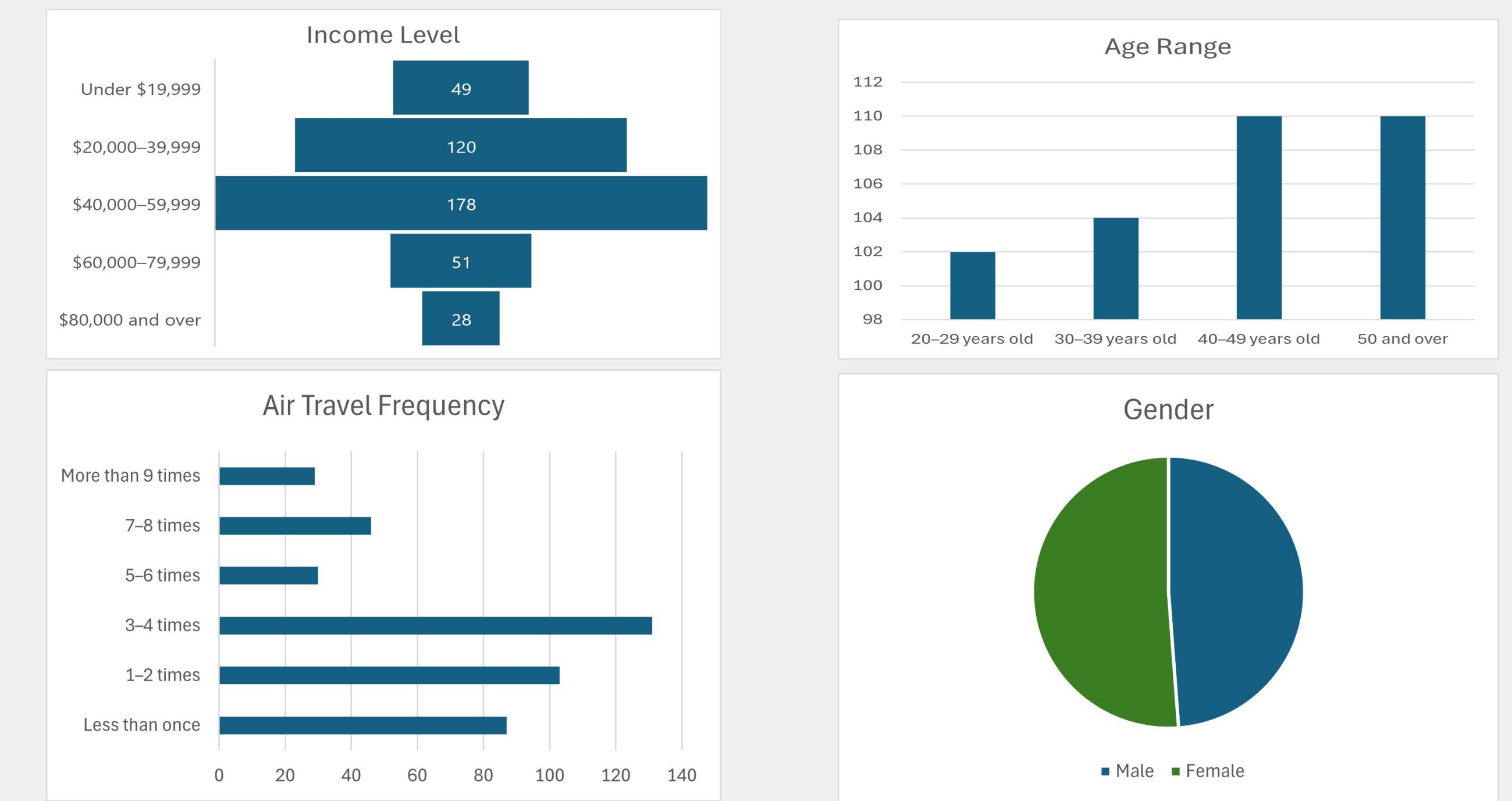


Figure 5. Demographics of Sustainable Aware Airline Passengers

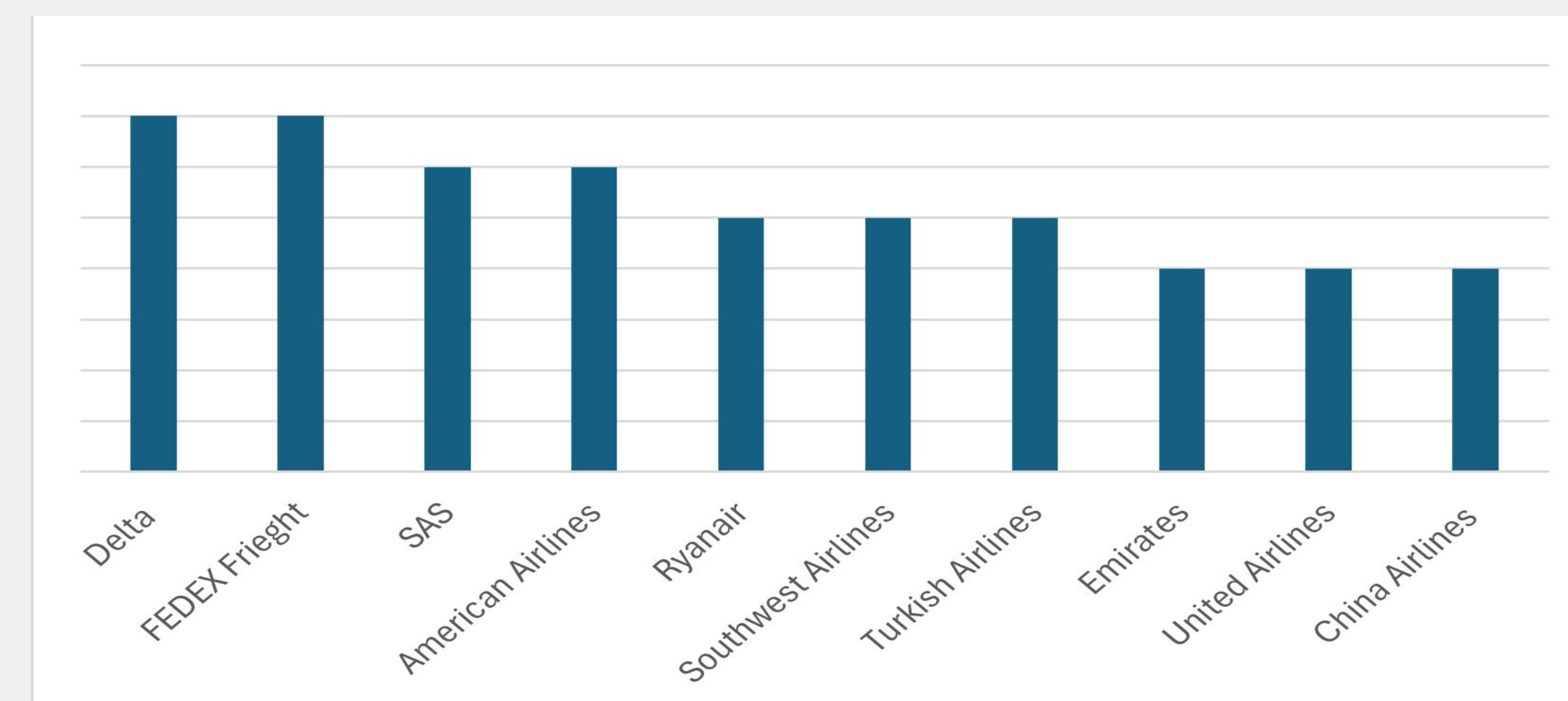


Figure 6. Airline Sustainable Practices Score

## Discussion

In addressing the research objectives outlined at the onset of this study, our investigation into the economic impact of sustainable airline practices has yielded noteworthy results. The first objective, to forecast the potential return on investment of sustainable aviation fuel was effectively achieved through the use of a discounted cash flows model. The second objective, which aimed to assess the cost of implementing electric ground support equipment, was also effectively achieved through the use of a cost benefit projection and showed the potential recurring costs of this equipment. The final task of conducting market research to determine the demographics of the average sustainability conscious consumer proved to be successful in displaying the sustainable airline market. The research conducted creates a strong argument for the implementation of certain sustainable practices into the airline industry.

## Acknowledgements

- This study was supported through an award provided by the **Undergraduate Research Opportunity Program** at the University of Minnesota Duluth.



## References

Delta. "Sustainability." Delta Air Lines. 2022. www.delta.com/en/about-delta/sustainability.  
Delta Air Lines, Inc. "Financials." Delta Air Lines. 2023. www.delta.com/en/about-delta/financials.  
Delta Air Lines. "GHG Emissions 2022." Delta. www.sustainability.deltair.com/ghg-emissions-2022. Accessed 5 Sept. 2024.  
Ember. "Carbon Price Tracker." Ember. 2023. ember-climate.org/data/carbon-price-viewer.  
"Environmental Reports | Our Planet | Emirates United States." United States. www.emirates.com/usa/flight/about-our-planet/environmental-reports.  
"GSE: Refueling | Ground Service Equipment Refueling." Westport Industries. 8 Sept. 2023. westport-ind.com/aviation/ground-service-equipment-refueling. Accessed 5 Sept. 2024.  
"Social Responsibility." China Southern Airlines Co., Ltd. 2018. www.casair.com/en/about-us/social-responsibility. Accessed 5 Sept. 2024.  
Southwest Airlines. "Sustainable One Report | Southwest Airlines." Southwest Airlines. 2021. www.southwest.com/en/report.  
Statista. "Global Travelers on Sustainable Travel (Optima Worldwide) by Age 2020." Statista. 2020. www.statista.com/statistics/1221050/travelers-optima-on-sustainable-travel-importance-worldwide-by-age/.  
Supervisor, Ryan, and Thomas Lindquist. "Sustainability Analysis of the Airline Industry - Low Cost Carriers and Full Service Carriers 2017."  
"Sustainable Logistics | FedEx Cases." FedEx.com. FedEx.com/our-focus/sustainable-logistics.  
TechSci Research. "Sustainable Aviation Fuel Market 2018-2028 by Size, Share, and Forecast | TechSci Research." TechSci Research. 2018. www.techsciresearch.com/reports/sustainable-aviation-fuel-market-1462.html. Accessed 5 Sept. 2024.  
U.S. Department of Energy. "Alternative Fuels Data Center: Electricity Laws and Incentives in Federal." Energy.gov. 2019. afdc.energy.gov/fuels/electricity.html.  
United Airlines, Inc. "Environmental Sustainability | United Airlines Corporate Responsibility Report." United Airlines. 2023. report.united.com/en/environmental-sustainability/.  
"What is SAS Doing to Make Flying More Sustainable?" FlySas.com. 2023. www.flysas.com/en/help-and-contact/faq/sustainability/what-is-sas-doing-to-make-flying-more-sustainable/.