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Sustainability-Oriented Passenger Decision-Making in Environmentally Friendly Air Transport

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ABSTRACT

This study investigates passenger decision-making in choosing environmentally friendly airlines by examining the relationships among Environmental Value Orientation (EVO), Perceived Environmental Credibility (PEC), Environmental Value Internalization (EVI), Decision Trade-off Evaluation (DTE), and Green Airline Choice Intention (GACI). A quantitative research approach was employed using survey data collected from 250 domestic airline passengers in Thailand. The proposed conceptual framework was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings reveal that EVO significantly influences both EVI and DTE, while PEC significantly enhances EVI. However, PEC does not significantly influence DTE. The results further demonstrate that both EVI and DTE positively affect GACI, with EVI emerging as the strongest predictor. These findings suggest that environmentally friendly airline choice is shaped by the combined influence of internalized environmental responsibility and passengers' willingness to evaluate practical trade-offs related to price, convenience, and travel conditions. The study contributes to the sustainable aviation literature by providing an integrated explanation of how environmental values, credibility perceptions, psychological internalization, and evaluative decision processes jointly influence environmentally responsible airline choice behavior.

1. INTRODUCTION

The aviation sector has long been recognized as one of the most influential industries supporting global mobility, international tourism, trade expansion, and economic integration. Despite its substantial economic contributions, the industry is increasingly scrutinized because of its environmental consequences, particularly its contribution to greenhouse gas emissions and global climate change. Recent research indicates that aviation-related emissions are projected to continue increasing alongside passenger demand unless substantial technological innovation and behavioral adaptation occur simultaneously [1, 2]. Consequently, sustainability has become a central strategic concern not only for airlines but also for regulators, policymakers, and international aviation organizations seeking to balance economic growth with environmental responsibility.

In response to increasing environmental expectations, airlines have adopted a wide range of sustainability-oriented initiatives. These include fleet modernization programs, fuel-efficiency improvements, investments in sustainable aviation fuel (SAF), carbon offset schemes, waste reduction strategies, and public sustainability disclosure practices. Such initiatives represent important operational and strategic efforts to reduce environmental impacts within the aviation industry. Nevertheless, the long-term effectiveness of these measures depends not solely on organizational implementation, but also on passenger acceptance and behavioral support [3]. Contemporary aviation studies increasingly emphasize that passengers are not passive consumers; rather, they function as influential stakeholders whose purchasing decisions shape the commercial viability of environmentally responsible airlines [4, 5]. Without sufficient consumer support, even well-designed sustainability initiatives may fail to generate meaningful market impact.

Recent studies in sustainable consumer behavior suggest that environmental awareness, ecological concern, and moral responsibility positively influence individuals' attitudes toward environmentally responsible travel options [6, 7]. Passengers who are environmentally conscious often express favorable opinions toward airlines that demonstrate sustainability commitments. However, positive attitudes do not always translate into actual behavioral intention or purchasing decisions. Existing literature consistently identifies the persistence of an "attitude-behavior gap" in sustainable aviation contexts, where travelers verbally support

environmental sustainability while simultaneously prioritizing lower prices, convenience, flight schedules, or service quality during airline selection [8, 9]. This inconsistency reflects the complex and multidimensional nature of airline decision-making.

Compared with many other consumption contexts, airline selection involves relatively high financial expenditure, greater perceived risk, and limited flexibility. These characteristics intensify passengers' cognitive evaluation processes and force travelers to balance environmental concerns against personal benefits. Empirical evidence suggests that even travelers with strong pro-environmental attitudes may hesitate to choose environmentally friendly airlines if doing so requires additional cost, less convenient schedules, or reduced service benefits [10, 11]. Thus, environmentally responsible airline selection cannot be explained solely through environmental awareness or ethical values. Instead, it requires deeper understanding of how passengers evaluate trade-offs between environmental benefits and individual sacrifice during the decision-making process [12].

Another important issue emerging in recent sustainability literature concerns growing public skepticism toward corporate environmental communication [13, 14]. In environmentally intensive industries such as aviation, passengers increasingly question whether sustainability claims genuinely reflect organizational commitment or merely function as marketing strategies [15]. This phenomenon has heightened concerns regarding greenwashing and has increased the importance of Perceived Environmental Credibility (PEC) in shaping consumer responses [16, 17]. PEC refers to the extent to which passengers believe that airlines' environmental claims are authentic, reliable, and trustworthy. When airline sustainability practices are perceived as credible, passengers are more likely to support environmentally responsible airlines and integrate environmental considerations into their travel decisions [18]. Conversely, skepticism toward corporate environmental communication may weaken trust and reduce the effectiveness of sustainability initiatives.

Although sustainable aviation research has expanded considerably in recent years, much of the existing literature continues to focus on isolated determinants of environmentally friendly airline choice, such as green image, willingness to pay, or environmental attitudes [19]. While these studies provide valuable insight, they offer limited understanding of the broader psychological processes that connect environmental values to actual decision-making behavior [20]. In particular, limited attention has been devoted to examining how environmental values become internalized within passengers' personal value systems, or how such internalization interacts with practical evaluations of price, convenience, and service trade-offs [21]. As a result, existing explanations of green airline choice behavior remain fragmented and insufficiently integrated [22].

To address these limitations, the present study proposes a more comprehensive and process-oriented framework for understanding passenger decision-making in environmentally friendly air transport. Specifically, this research investigates the interrelationships among Environmental Value Orientation (EVO), PEC, Environmental Value Internalization (EVI), Decision Trade-off Evaluation (DTE), and Green Airline Choice Intention (GACI). By examining both psychological and evaluative mechanisms simultaneously, this study seeks to contribute to the theoretical development of sustainable consumer behavior in aviation while also offering practical implications for airlines aiming to design credible, effective, and consumer-oriented sustainability strategies.

2. RESEARCH BACKGROUND

2.1 Environmental Value Orientation

EVO refers to individuals' enduring beliefs, ethical principles, and value systems regarding environmental preservation and ecological sustainability. These values shape how individuals perceive environmental issues and influence the degree to which they support environmentally responsible behaviors in daily life [23]. Contemporary sustainability research increasingly identifies environmental values as a fundamental antecedent of pro-environmental attitudes, judgments, and behavioral tendencies across multiple consumption contexts [24].

Individuals with strong EVO tend to perceive environmental protection as an important moral responsibility. Such individuals are generally more concerned about climate change, pollution, resource depletion, and the long-term environmental consequences of consumption activities. As a result, they are more likely to favor organizations, brands, and services that demonstrate commitment to sustainability [25]. In transportation and tourism contexts, EVO has been found to positively influence support for low-carbon travel options, sustainable tourism initiatives, and environmentally responsible consumption patterns [26].

Within the aviation industry, the role of EVO is particularly significant because air travel is frequently associated with high carbon emissions and environmental impact [27]. Passengers who prioritize environmental sustainability may therefore evaluate airline choices not only in terms of economic or functional benefits but also according to environmental performance. Environmentally conscious travelers are often more receptive toward airlines that invest in fuel-efficient technologies, carbon reduction programs, or sustainable aviation fuel initiatives [28].

However, recent studies emphasize that EVO alone is insufficient to guarantee environmentally responsible purchasing behavior. Airline selection remains a highly complex consumption decision involving substantial financial cost, convenience considerations, travel schedules, and service quality expectations. Even individuals with strong environmental values may prioritize personal utility when sustainable alternatives require higher cost or greater inconvenience [1, 29]. Accordingly, EVO should be viewed primarily as an initial motivational foundation that shapes evaluative tendencies rather than as a direct predictor of green airline choice behavior.

2.2 Perceived Environmental Credibility

PEC refers to passengers' perceptions regarding the authenticity, reliability, and trustworthiness of airlines' environmental commitments and sustainability-related communication [30]. In recent years, environmental credibility has become increasingly important due to rising public concern regarding misleading environmental claims and corporate greenwashing practices. Consumers are now more critical and selective when evaluating sustainability-

related information provided by organizations, especially in industries associated with substantial environmental impact such as aviation [31, 32].

Environmental credibility functions as an evaluative mechanism through which consumers interpret and validate environmental claims. Passengers are more likely to respond positively to airlines whose sustainability initiatives appear transparent, verifiable, and genuinely integrated into organizational operations. Examples include measurable emission reduction targets, transparent sustainability reporting, investments in cleaner technologies, and visible environmental programs. When such initiatives are perceived as credible, passengers are more willing to trust airlines' environmental commitments and consider sustainability information during airline selection [33].

In contrast, skepticism toward environmental communication may significantly reduce passengers' willingness to support environmentally friendly airlines. If travelers perceive airline sustainability campaigns as exaggerated, deceptive, or primarily promotional in nature, environmental claims may lose persuasive effectiveness. Such perceptions can weaken trust, reduce consumer confidence, and negatively affect environmentally responsible behavioral intention. The growing prevalence of greenwashing concerns therefore makes credibility an increasingly critical factor in sustainable consumer decision-making [34, 35].

In the aviation context, PEC is particularly relevant because passengers often possess limited direct knowledge regarding the actual environmental performance of airlines. Consequently, travelers rely heavily on communicated information, public reputation, certification systems, and corporate transparency when evaluating airline sustainability. Environmental credibility therefore serves as an important intermediary between organizational sustainability initiatives and passenger behavioral response.

2.3 Environmental Value Internalization

EVI refers to the psychological process through which environmental values become deeply integrated into an individual's personal belief system, identity, and self-concept. Unlike temporary attitudes or situational preferences, internalized values are relatively stable and exert stronger influence over long-term behavior. Sustainability literature increasingly highlights value internalization as a critical mechanism explaining why some individuals consistently engage in environmentally responsible actions despite external barriers or inconvenience [36].

When environmental values are internalized, pro-environmental behavior becomes personally meaningful rather than socially symbolic. Individuals no longer engage in environmentally responsible actions solely because of external pressure, social expectations, or reputational concerns. Instead, such behavior reflects personal identity, moral alignment, and self-consistency. Internalized environmental values therefore create stronger psychological commitment toward sustainable consumption practices [37].

In the context of airline choice, EVI may influence how passengers interpret and prioritize sustainability-related information [38]. Travelers who internalize environmental responsibility are more likely to perceive environmentally friendly airline selection as an extension of their personal values and ethical identity. Supporting sustainable airlines may therefore generate psychological satisfaction and reinforce self-perception as environmentally responsible consumers [39].

Recent empirical evidence further suggests that internalized environmental values strengthen consumer commitment toward sustainable consumption while reducing dependence on external incentives [40]. Passengers with strong environmental internalization may demonstrate greater tolerance toward minor inconvenience or higher costs associated with environmentally friendly airlines. For this reason, EVI is often conceptualized as a mediating mechanism connecting environmental values and actual behavioral outcomes [41, 42].

Nevertheless, internalized environmental values do not always guarantee sustainable behavioral intention. Particularly in high-cost consumption contexts such as aviation, practical considerations may still outweigh moral commitment. Consequently, examining EVI alongside evaluative decision processes is essential for understanding sustainable airline choice behavior comprehensively.

2.4 Decision Trade-off Evaluation

DTE refers to passengers' cognitive assessment of the relative advantages and disadvantages associated with selecting environmentally friendly airlines. This evaluation process typically involves balancing environmental benefits against practical considerations such as ticket price, convenience, flight availability, travel time, and service quality.

Airline selection inherently involves complex trade-offs because environmentally friendly alternatives may not always provide the most economically attractive or convenient options [37]. Sustainable airline practices often require significant operational investment, which may lead to higher ticket prices or limited route flexibility [38]. Consequently, passengers must evaluate whether the perceived environmental benefits justify the additional personal sacrifice associated with environmentally responsible travel choices [43].

Recent research demonstrates that trade-off evaluation plays a central role in sustainable travel decision-making. Even environmentally conscious passengers carefully assess practical implications before committing to sustainable alternatives [44]. Travelers may support environmental sustainability conceptually while simultaneously resisting environmentally friendly options that significantly reduce convenience or increase travel expenditure [45].

This evaluative process is particularly important in explaining the widely recognized attitude-behavior gap within sustainable aviation. Passengers may express strong environmental concern and favorable attitudes toward sustainable airlines, yet ultimately prioritize personal utility when making final purchasing decisions [1, 42]. DTE therefore represents a critical mechanism through which environmental motivation is either reinforced or constrained during actual airline selection.

Accordingly, DTE can be understood as a practical decision filter moderating the translation of environmental values into behavioral intention. Passengers who perceive trade-offs as acceptable are more likely to choose environmentally friendly airlines, whereas unfavorable trade-off perceptions may weaken sustainable choice intention regardless of environmental attitudes.

2.5 Green Airline Choice Intention

GACI refers to passengers' willingness, preference, and planned intention to select airlines that actively engage in environmentally responsible practices. This construct reflects travelers' behavioral readiness to support sustainable aviation through future airline selection decisions [46].

Contemporary sustainable consumption literature conceptualizes green choice intention as the outcome of a multidimensional decision-making process influenced by psychological values, credibility perceptions, personal beliefs, and evaluative considerations [47]. Studies conducted in recent years suggest that passengers are more likely to demonstrate GACI when they perceive alignment between their personal environmental values and airlines' sustainability practices [48].

GACI is also influenced by trust in environmental communication and perceived authenticity of sustainability initiatives [49]. Passengers who believe that airlines genuinely invest in environmental responsibility are more willing to support such airlines through purchasing behavior. At the same time, practical considerations remain highly influential. Even passengers with strong sustainability orientation may hesitate to choose green airlines if associated trade-offs are perceived as excessive [50].

Therefore, GACI should not be viewed as the result of a single motivational factor. Instead, it reflects the combined influence of environmental values, credibility perceptions, psychological internalization, and rational trade-off evaluation. Understanding how these dimensions interact is essential for explaining sustainable passenger behavior and for helping airlines design more effective environmental strategies within increasingly competitive aviation markets [51].

2.6 Research hypotheses

Based on the proposed conceptual framework, passenger decision-making in choosing environmentally friendly airlines is explained through the structural relationships among EVO, PEC, EVI, DTE, and GACI. Accordingly, the following hypotheses are proposed, as illustrated in Figure 1

H1: EVO has a positive effect on EVI.
H2: EVO has a positive effect on DTE.
H3: PEC has a positive effect on EVI.
H4: PEC has a positive effect on DTE.
H5: EVI has a positive effect on GACI.
H6: DTE has a positive effect on GACI.

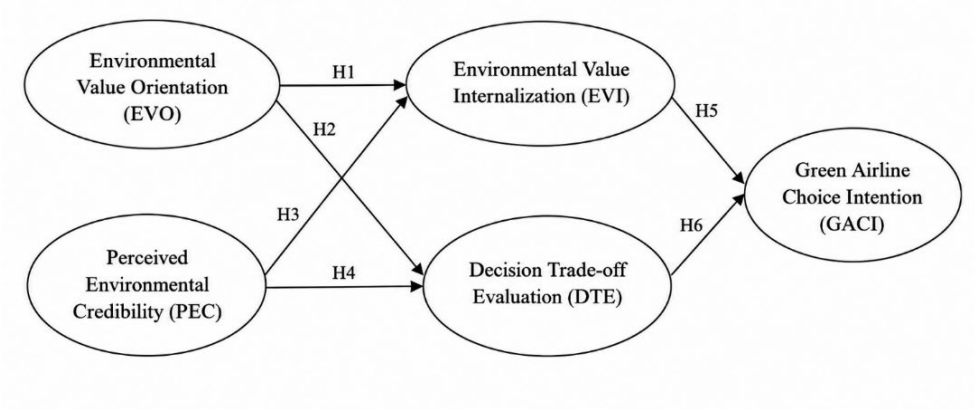

Figure 1. Conceptual framework

3. METHODOLOGY

This study investigates passenger decision-making in choosing environmentally friendly airlines by examining the structural relationships among EVO, PEC, EVI, DTE, and GACI. A quantitative research approach was employed to test the proposed conceptual framework and research hypotheses using survey data collected from airline passengers in Thailand. The study was conducted over a one-month period, from 1 to 30 December 2025, following approval from the Ethics Committee. University of Geomatika Malaysia approval from the University's Research Committee. All research procedures were carried out in compliance with the ethical principles outlined in the Belmont Report and established standards for social and behavioral research.

3.1 Population and sampling

The target population of this study consists of airline passengers who have traveled within Thailand, regardless of airline type, route, or travel purpose. This population was selected because domestic air travel represents a significant segment of Thailand's aviation market and provides an appropriate and relevant context for examining passenger decision-making related to environmentally friendly airline choices. The unit of analysis in this study is the individual airline passenger, as the research focuses on personal values, perceptions, and decision-making processes associated with airline selection. A purposive sampling technique was employed to select respondents who had prior experience traveling by airline within Thailand and were aged 18 years or older. To facilitate data collection and improve access to eligible respondents, convenience sampling was also applied through online distribution channels. This combined sampling approach is considered appropriate for behavioral research in contexts where a comprehensive sampling frame of airline passengers is not readily available.

3.2 Sample size determination

The sample size for this study was determined based on the ten-times rule for Partial Least Squares Structural Equation Modeling (PLS-SEM), which recommends that the minimum sample size should be at least ten times the number of observed

indicators used to measure the constructs in the research model. In this study, the research instrument comprises 25 observed questionnaire items representing the latent constructs in the proposed conceptual framework. Accordingly, the minimum required sample size was calculated as 250 respondents. The expected sample size was therefore set at 250 respondents, and the actual usable sample size obtained was 250 respondents, which meets and satisfies the recommended minimum threshold for conducting PLS-SEM analysis.

3.3 Research instrument

The research instrument used in this study is a structured questionnaire consisting of 25 items divided into five sections corresponding to the study constructs: EVO, PEC, EVI, DTE, and GACI. All construct-related items were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), allowing respondents to indicate the extent of their agreement with each statement. The questionnaire was developed based on an extensive review of relevant literature and subsequently refined through expert consultation to ensure content validity and conceptual alignment with the research objectives and hypotheses.

3.4 Data collection and analysis

Data were collected using an online questionnaire distributed via social media platforms and online communities related to travel within Thailand. Participation in the study was voluntary, and informed consent was obtained from all respondents prior to questionnaire completion. A total of 250 fully completed questionnaires were collected and screened to ensure data completeness and suitability for analysis. Data analysis was conducted using IBM Statistical Package for the Social Sciences (SPSS) Statistics for descriptive statistical analysis and SmartPLS for inferential analysis. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize respondents' demographic characteristics and general response patterns. Inferential analysis was performed using PLS-SEM to evaluate both the measurement model and the structural model. Reliability and validity were assessed using Cronbach's Alpha, Composite Reliability (CR), Average Variance Extracted (AVE), and discriminant validity criteria. Hypothesis testing was conducted using the bootstrapping procedure with a significance level set at 0.05 to determine the significance of the proposed relationships.

4. RESULTS

The analysis of a sample of 250 airline passengers who traveled within Thailand provides important insights into respondents' demographic characteristics and their environmentally related perceptions and intentions regarding airline choice. Among the respondents, 62.8% (n = 157) were female and 37.2% (n = 93) were male. The majority of participants were aged 20-29 years (68.4%, n = 171). In terms of marital status, 70.0% (n = 175) reported being single, while 66.8% (n = 167) were employed in the private sector. Regarding monthly income, 24.0% (n = 60) reported earning between 20,001 and 30,000 Baht, indicating a sample largely composed of young, working-age domestic air travelers.

Overall, respondents demonstrated high levels of environmental orientation and awareness related to air travel. The descriptive statistics reveal consistently high mean scores across the key constructs, including EVO, PEC, EVI, DTE, and GACI. These findings suggest that the majority of passengers possess a strong understanding of environmental issues associated with aviation, perceive airline environmental initiatives as credible, and express a willingness to consider environmental factors when making airline choices.

Furthermore, respondents indicated a positive inclination toward environmentally friendly airlines, particularly when environmental benefits were perceived as meaningful and credible. Although environmental values were strongly internalized at the individual level, passengers also demonstrated sensitivity to practical considerations, such as price and convenience, highlighting the importance of trade-off evaluation in airline decision-making. The overall pattern of responses supports the relevance of integrating value-based and evaluative mechanisms in explaining environmentally friendly airline choice behavior.

The adequacy of the measurement model was subsequently assessed, and the fit statistics are presented in Table 1, which summarizes the overall evaluation of the measurement model.

Table 1. Summarizes the fit statistics of the measurement model

	Saturated Model	Estimated Model
SRMR	0.038	0.080
d_ULS	0.460	2.057
d_G	0.427	0.503
Chi-square	991.235	1078.619
NFI	0.917	0.910

Note: SRMR: Standardized Root Mean Squared; NFI: Normed Fit Index.

The adequacy of the measurement model was assessed using several model fit, reliability, convergent validity, and discriminant validity criteria. As presented in Table 1, the model demonstrated an acceptable level of fit with the empirical data. The standardized root mean square residual (SRMR) value of 0.080 was within the recommended threshold of 0.08, while the normed fit index (NFI) value of 0.910 exceeded the recommended minimum threshold of 0.90, indicating satisfactory model fit and adequacy for subsequent structural model analysis. Following the guidelines proposed by Hair et al. [52], the reliability and convergent validity of the measurement model were further evaluated. As shown in Table 2, all standardized factor loadings exceeded the recommended threshold of 0.70 and were statistically significant, indicating satisfactory indicator reliability. CR and Cronbach's alpha (α) values for all constructs were above 0.90, confirming excellent internal consistency reliability. In addition, all AVE values exceeded the recommended threshold of 0.50, demonstrating adequate convergent validity and indicating that the constructs explained a substantial proportion of variance in their indicators, consistent with prior research [53]. Variance inflation factor (VIF) values ranged from 1.112 to 1.150, which were well below the recommended threshold of 5.00, suggesting that multicollinearity was not a concern and that the estimated relationships among the constructs were stable. Furthermore, discriminant validity was assessed using the Fornell–Larcker criterion. As presented in Table 3, the square root of the AVE for each construct exceeded the corresponding inter-construct correlations, satisfying the recommended criterion established by Fornell

and Larcker [54]. Specifically, the square root of AVE values ranged from 0.871 to 0.947, exceeding the correlations among EVO, PEC, EVI, DTE, and GACI. These findings confirm that all constructs are empirically distinct and support the discriminant validity of the measurement model.

Table 2. Measurement model results

Constructs	Measurement Label	Loading	T-Value
Environmental Value Orientation (EVO) \nVIF = 1.112; CR = 0.946; α = 0.928; AVE = 0.777	EVO1. I have a good understanding of environmental issues related to climate change.	0.942	46.081
	EVO2. I am aware of how air travel contributes to environmental and climate problems.	0.897	40.281
	EVO3. Protecting the environment is an important value that guides my travel decisions.	0.864	33.441
	EVO4. I consider environmental sustainability when selecting airlines.	0.865	34.552
	EVO5. I feel concerned about the environmental impact of aviation activities.	0.835	31.287
Perceived Environmental Credibility (PEC) \nVIF = 1.112; CR = 0.956; α = 0.940; AVE = 0.813	PEC1. I believe that airlines' environmental claims are generally trustworthy.	0.710	17.789
	PEC2. I feel confident that airlines communicate their environmental practices honestly.	0.946	58.642
	PEC3. I believe that airlines genuinely implement environmental initiatives rather than merely promoting them.	0.930	49.736
	PEC4. Airlines provide reliable information regarding their environmental performance.	0.958	72.155
	PEC5. I trust airlines that publicly disclose sustainability practices.	0.941	61.328
Environmental Value Internalization (EVI) \nVIF = 1.150; CR = 0.940; α = 0.920; AVE = 0.758	EVI1. Choosing environmentally friendly airlines reflects who I am as a person.	0.866	41.324
	EVI2. I feel personally responsible for reducing the environmental impact of my air travel.	0.843	36.112
	EVI3. Supporting environmentally friendly airlines is consistent with my personal values.	0.871	43.887
	EVI4. Environmental responsibility is an important part of my identity as a traveler.	0.910	55.742
	EVI5. I feel guilty when choosing airlines with poor environmental performance.	0.862	39.465
Decision Trade-off Evaluation (DTE) \nVIF = 1.112; CR = 0.971; α = 0.962; AVE = 0.869	DTE1. I am willing to pay a higher ticket price to fly with environmentally friendly airlines.	0.935	67.341
	DTE2. I am willing to choose less convenient flight options if they are more environmentally friendly.	0.978	108.554
	DTE3. Environmental benefits are important enough to justify trade-offs in airline choice.	0.960	84.629
	DTE4. I would accept additional travel time for more sustainable airline services.	0.881	49.733
	DTE5. I am willing to compromise comfort to support environmentally responsible airlines.	0.905	58.417
Green Airline Choice Intention (GACI) \nVIF = 1.150; CR = 0.978; α = 0.971; AVE = 0.897	GACI1. I intend to choose environmentally friendly airlines when booking flights in the future.	0.940	73.285
	GACI2. I would prefer environmentally friendly airlines over conventional airlines.	0.915	59.712
	GACI3. I am willing to support airlines that actively reduce their environmental impact.	0.943	77.419
	GACI4. I plan to prioritize airlines with strong environmental commitments.	0.985	141.336
	GACI5. I will recommend environmentally friendly airlines to others.	0.952	88.514

Note: CR: Composite Reliability; α: Cronbach's Alpha Values; AVE: Average Variance Extracted

Table 3. Discriminant validity using the Fornell-Larcker criterion

Construct	Mean	S.D.	DTE	EVI	EVO	GACI	PEC
DTE	4.277	1.071	0.932				
EVI	4.532	1.136	0.362	0.871			
EVO	4.315	1.118	0.302	0.424	0.881		
GACI	4.161	1.113	0.334	0.544	0.412	0.947	
PEC	4.173	1.155	0.165	0.340	0.317	0.289	0.902

Notes: The values of the square root of Average Variance Extracted (AVE) are presented through the italicised diagonal elements. The other elements present the mutual correlations among the constructs [54].

Table 4. Discriminant validity assessment using Heterotrait-Monotrait Ratio (HTMT)

Construct	DTE	EVI	EVO	GACI	PEC
DTE					
EVI	0.381				
EVO	0.319	0.455			
GACI	0.345	0.575	0.433		
PEC	0.174	0.364	0.340	0.303	

Note: All Heterotrait-Monotrait Ratio (HTMT) values were below the recommended threshold of 0.85, indicating adequate discriminant validity among the constructs [52].

Table 5. Structural model results

Hypothesis	Hypothesized Path	β	T-Value	P-Value	Result
H1	EVO → EVI	0.351	6.633	0.000	Supported
H2	EVO → DTE	0.278	4.800	0.000	Supported
H3	PEC → EVI	0.228	4.610	0.000	Supported
H4	PEC → DTE	0.077	1.365	0.172	Not Supported
H5	EVI → GACI	0.487	9.681	0.000	Supported
H6	DTE → GACI	0.158	3.089	0.002	Supported

Note: β = Path Coefficient.

Table 4 presents the Heterotrait-Monotrait Ratio (HTMT) values used to assess discriminant validity. All values ranged from 0.174 to 0.575, which were below the recommended threshold of 0.85, confirming that each construct was empirically distinct from the others. Table 5 presents the results of the structural model analysis and hypothesis testing. The findings indicate that EVO significantly and positively influences both EVI ($\beta = 0.351$, $t = 6.633$, $p < 0.001$) and DTE ($\beta = 0.278$, $t = 4.800$, $p < 0.001$), supporting H1 and H2. These results suggest that passengers with stronger environmental values are more likely to internalize environmental responsibility and consider environmental trade-offs when selecting airlines.

PEC was also found to have a significant positive effect on EVI ($\beta = 0.228$, $t = 4.610$, $p < 0.001$), supporting H3. This indicates that passengers who perceive airline environmental initiatives as credible and trustworthy are more likely to incorporate environmental concerns into their personal values and identity. However, the relationship between PEC and DTE was not statistically significant ($\beta = 0.077$, $t = 1.365$, $p = 0.172$), leading to the rejection of H4.

Furthermore, EVI exerted the strongest positive effect on GACI ($\beta = 0.487$, $t = 9.681$, $p < 0.001$), supporting H5. This finding demonstrates that passengers who strongly internalize environmental values are more likely to choose environmentally friendly airlines. In addition, DTE significantly influenced GACI ($\beta = 0.158$, $t = 3.089$, $p = 0.002$), supporting H6. This suggests that passengers' willingness to accept trade-offs related to price, convenience, or comfort also contributes to environmentally friendly airline choice intention. Overall, the results provide substantial support for the proposed conceptual framework.

Table 6 reports the mediation effects. EVI significantly mediated the relationships between EVO and GACI, as well as PEC and GACI. In contrast, DTE did not significantly mediate the relationship between PEC and GACI.

Table 7 presents the PLS-Predict results at the latent variable level. All endogenous constructs produced positive Q^2predict values, indicating that the model has predictive relevance. Among the constructs, EVI demonstrated the highest predictive capability (Q^2predict = 0.215), followed by GACI and DTE.

Table 6. Indirect effects analysis

Indirect Path	β	T-Value	P-Value	Result
EVO → EVI → GACI	0.171	5.215	0.000	Supported
EVO → DTE → GACI	0.044	2.363	0.018	Supported
PEC → EVI → GACI	0.111	4.182	0.000	Supported
PEC → DTE → GACI	0.012	1.208	0.227	Not Supported

Table 7. PLS-Predict assessment (Latent variable level)

Construct	Q^2predict	RMSE	MAE
DTE	0.083	0.963	0.759
EVI	0.215	0.891	0.695
GACI	0.167	0.917	0.770

Note: Q^2predict values greater than zero indicate predictive relevance of the model; RMSE: Root Mean Square Error; MAE: Mean Absolute Error.

Table 8. Cross-validated predictive ability test (CVPAT) assessment results

Construct	PLS Loss	IA Loss	Average Loss Difference	T-Value	P-Value	Result
DTE	1.539	1.658	-0.119	2.538	0.012	Supported
EVI	1.368	1.634	-0.266	4.737	0.000	Supported
GACI	1.448	1.702	-0.254	5.539	0.000	Supported
Overall	1.452	1.665	-0.213	5.538	0.000	Supported

Note: Negative average loss difference values indicate that the Partial Least Squares Structural Equation Modeling (PLS-SEM) model outperformed the indicator average (IA) benchmark.

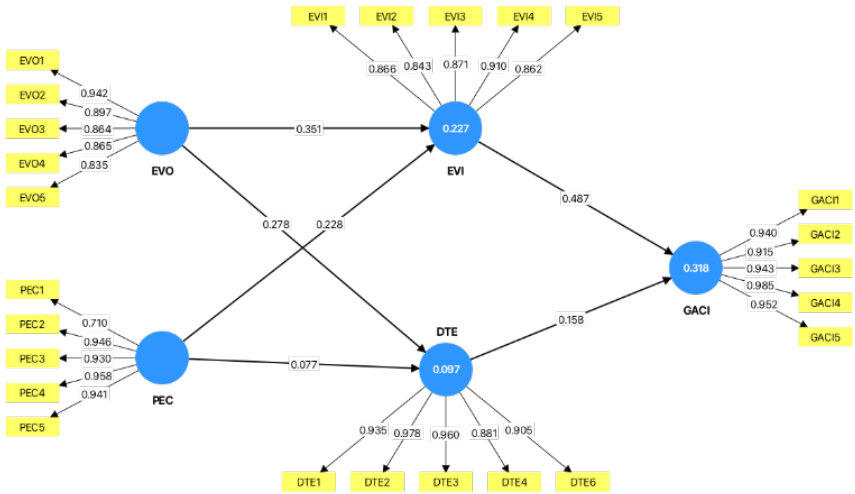

Figure 2. Structural model results of the Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis

Table 8 reports the cross-validated predictive ability test (CVPAT) assessment comparing the predictive performance of the PLS-SEM model against the indicator average (IA) benchmark. All constructs showed negative average loss difference values with significant p-values, demonstrating that the PLS-SEM model achieved superior predictive performance relative to the benchmark model.

The structural model was evaluated using PLS-SEM, and the results of the direct effect analysis are illustrated in Figure 2 and summarized in Table 5. The findings indicate that EVO has a significant positive effect on EVI ($\beta = 0.351$, $t = 6.633$, $p < 0.001$) and DTE ($\beta = 0.278$, $t = 4.800$, $p < 0.001$), supporting H1 and H2. These results suggest that passengers with stronger environmental values are more likely to internalize environmental responsibility and to consider trade-offs associated with environmentally friendly airline choices. In addition, PEC significantly influences EVI ($\beta = 0.228$, $t = 4.610$, $p < 0.001$), supporting H3. This finding indicates that when airline environmental initiatives are perceived as credible and trustworthy, passengers are more likely to incorporate environmental concerns into their personal values and identity.

However, the relationship between PEC and DTE was not statistically significant ($\beta = 0.077$, $t = 1.365$, $p = 0.172$), leading to the rejection of H4. This result suggests that although passengers may perceive airline environmental initiatives as credible, such perceptions alone may not be sufficient to influence their willingness to accept trade-offs such as higher ticket prices, reduced convenience, or additional travel time.

Furthermore, EVI was found to exert a strong and statistically significant positive effect on GACI ($\beta = 0.487$, $t = 9.681$, $p < 0.001$), supporting H5. This finding demonstrates that passengers who strongly internalize environmental values are more likely to intend to choose environmentally friendly airlines. DTE also showed a significant positive influence on GACI ($\beta = 0.158$, $t = 3.089$, $p = 0.002$), supporting H6. This indicates that passengers' willingness to accept practical trade-offs plays an important role in shaping environmentally responsible airline choice intentions.

The structural model also demonstrated satisfactory explanatory power. As shown in Figure 2, EVO and PEC jointly explained 22.7% of the variance in EVI ($R^2 = 0.227$), while the same predictors explained 9.7% of the variance in DTE ($R^2 = 0.097$). In addition, EVI and DTE together explained 31.8% of the variance in GACI ($R^2 = 0.318$). Overall, the findings provide empirical support for the proposed conceptual framework and highlight the importance of both psychological value internalization and practical decision trade-offs in explaining environmentally friendly airline choice behavior.

5. DISCUSSION

The findings of this study contribute to a deeper understanding of passenger decision-making in choosing environmentally friendly airlines by clarifying the mechanisms through which environmental values and credibility perceptions influence behavioral intention. The results indicate that EVO plays a foundational role in shaping passengers' decision processes by significantly influencing both EVI and DTE. This finding suggests that passengers who possess strong pro-environmental values are more likely to internalize environmental responsibility and actively evaluate environmental implications when selecting airlines. These findings are consistent with sustainable consumption literature emphasizing that environmental values function as cognitive antecedents shaping environmentally responsible behavior and evaluative judgments rather than directly determining purchasing intention [6, 24, 42, 28]. Furthermore, environmentally conscious travelers tend to demonstrate stronger willingness to support low-carbon or sustainable travel alternatives when environmental values are aligned with personal beliefs and behavioral expectations [25, 27].

The findings also highlight the important role of PEC in sustainable airline decision-making. The significant relationship between PEC and EVI suggests that passengers are more likely to incorporate environmental concerns into their personal identity when airline sustainability initiatives are perceived as authentic, transparent, and trustworthy. This result supports prior research indicating that credibility and trust are essential for reducing consumer skepticism and strengthening support for environmentally responsible organizations [30, 31, 33]. In the aviation industry, where concerns regarding greenwashing and symbolic sustainability communication are increasingly prominent, PEC becomes particularly important in shaping passenger responses toward airline environmental initiatives [14, 15, 16, 17]. However, contrary to expectations, PEC did not significantly influence DTE. This suggests that although passengers may trust

airlines' environmental claims, credibility alone may not be sufficient to persuade travelers to accept sacrifices related to higher ticket prices, additional travel time, or reduced convenience. In practice, passengers may distinguish between believing sustainability claims and being personally willing to bear the economic or functional costs associated with sustainable air travel.

Another important finding concerns the role of EVI. The results demonstrate that EVI exerts a significant positive effect on GACI, indicating that passengers who internalize environmental responsibility are more likely to intend to support environmentally friendly airlines. This finding suggests that environmentally responsible airline choice behavior is partially driven by psychological identification with sustainability values and environmentally responsible self-concepts. Previous studies similarly argue that moral identity, green self-identity, and internalized environmental responsibility strengthen individuals' willingness to engage in sustainable consumption behavior [39, 40, 41]. In addition, sustainability-related organizational practices may reinforce consumers' internalization processes by increasing perceived alignment between personal environmental values and corporate environmental actions [36, 37].

The findings further reveal that DTE significantly influences GACI, highlighting the importance of rational evaluation processes in environmentally friendly airline selection. Passengers who are willing to evaluate and accept trade-offs associated with sustainable airline choices are more likely to support environmentally friendly airlines. This result reinforces the argument that sustainable travel decisions are not driven solely by moral obligation or environmental concern, but also by passengers' willingness to balance environmental benefits against practical sacrifices such as price, comfort, and convenience [43, 44, 45]. Similar findings have been observed in aviation and transportation studies indicating that willingness to pay, perceived environmental benefit, and cost–benefit evaluation significantly shape sustainable travel behavior [48, 49, 50]. This reflects the broader reality that airline selection remains a high-involvement consumption decision in which environmental concern must compete with economic and functional considerations [10, 11].

Taken together, the findings suggest that environmentally friendly airline choice behavior follows an integrated and sequential decision-making process. EVO and PEC function as upstream psychological drivers shaping passengers' environmental perceptions, value internalization, and evaluative mechanisms, while DTE acts as a more immediate determinant of behavioral intention. This integrated perspective extends sustainable aviation and sustainable consumption literature by demonstrating that environmentally friendly airline choice emerges through the interaction between value-based motivations and pragmatic evaluations of cost, convenience, and service-related sacrifice [5, 8, 46, 47]. The findings also support recent arguments that sustainable transportation decision-making should be understood through multidimensional frameworks integrating psychological, social, and practical determinants simultaneously [3, 21].

From a managerial perspective, the findings imply that airlines seeking to encourage environmentally friendly passenger behavior should move beyond symbolic sustainability communication and focus on strengthening the credibility and transparency of their environmental initiatives. Airlines should provide measurable sustainability evidence, transparent reporting systems, and clearly communicated environmental outcomes in order to enhance passenger trust and reduce skepticism toward green marketing claims [13, 4]. At the same time, airlines should emphasize how environmental benefits justify potential trade-offs while minimizing perceived inconvenience associated with sustainable airline options. Sustainable aviation strategies that successfully integrate credible environmental communication with passengers' practical evaluative processes are more likely to strengthen environmentally friendly airline choice intentions and contribute to long-term sustainable aviation development [2, 19, 51, 55].

6. CONCLUSIONS

This study examined passenger decision-making in choosing environmentally friendly airlines by investigating the relationships among EVO, PEC, EVI, DTE, and GACI. The findings confirm that both environmental values and PEC significantly shape passengers' internalization processes and evaluative decision-making mechanisms. EVO positively influenced both EVI and DTE, while PEC significantly enhanced EVI. Furthermore, both EVI and DTE positively influenced GACI, highlighting the combined importance of psychological and practical decision factors in sustainable airline selection.

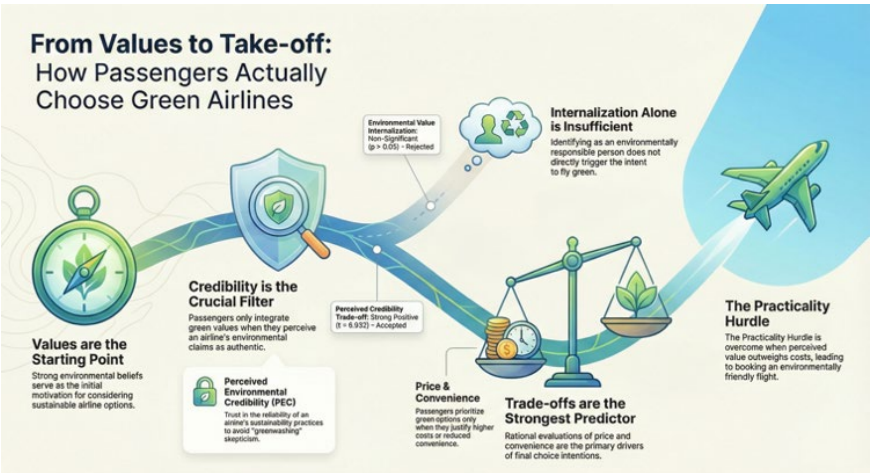

Figure 3. From environmental values to Green Airline Choice Intention (GACI)

Importantly, the results indicate that environmentally friendly airline choice is not driven solely by environmental concern or moral obligation. Instead, passengers' willingness to evaluate and accept trade-offs related to ticket price, convenience, comfort, and travel time plays a critical role in shaping behavioral intention. These findings suggest that sustainable airline choice behavior reflects an integrated process combining environmental values, perceived credibility, psychological internalization, and rational decision evaluation. The study therefore contributes to sustainable aviation literature by providing a more comprehensive explanation of how passengers translate environmental concerns into actual airline choice intention.

As illustrated in Figure 3, the proposed framework demonstrates that environmentally friendly airline choice emerges through the interaction between value-based motivations and practical decision considerations. EVO serves as the initial motivational driver, while PEC strengthens passengers' trust in airline sustainability initiatives. EVI reflects the psychological incorporation of environmental responsibility into passengers' self-concept, whereas DTE represents the practical assessment of whether environmental benefits justify personal sacrifices. Overall, the framework emphasizes that GACI is shaped not only by environmental beliefs but also by passengers' willingness to reconcile sustainability goals with economic and functional realities associated with air travel.

7. FUTURE RESEARCH DIRECTIONS

Future research could extend the present study by incorporating additional moderating or mediating variables that may influence sustainable airline decision-making, such as price sensitivity, environmental knowledge, travel frequency, travel purpose, perceived service quality, or social influence. Including these variables may provide a deeper understanding of the conditions under which passengers are more willing to support environmentally friendly airlines. Comparative studies across different countries, airline types, or cultural contexts may also improve the generalizability of the findings and provide broader insight into sustainable passenger behavior across global aviation markets.

In addition, future studies may benefit from applying longitudinal or experimental research designs to investigate how environmentally friendly airline choice behavior evolves over time and whether stated behavioral intentions translate into actual purchasing behavior. Such approaches could help address the persistent attitude-behavior gap frequently observed in sustainable consumption research. Further exploration of real booking behavior, willingness-to-pay mechanisms, and the effectiveness of airline sustainability communication strategies would also contribute valuable theoretical and managerial insights for advancing sustainable aviation practices.

AUTHOR CONTRIBUTIONS

Conceptualization, J.L, Z.R., and B.P.; methodology, J.L and B.P.; software, J.L.; validation, J.L. and D.T.; formal analysis, J.L, Z.R., and D.T.; investigation, B.P.; resources, J.L.; data curation, B.P.; writing–original draft preparation, J.L., Z.R., P.S. and D.T.; writing-review and editing, J.L, Z.R., and P.S.; visualization, J.L, Z.R., and P.S.; supervision, J.L.; project administration, J.L. and D.T; funding acquisition, J.L. All authors have read and agreed to the published version of the manuscript.

INSTITUTIONAL REVIEW BOARD STATEMENT

Institutional Review Board Statement: The document is a Certificate of Approval from University of Geomatika Malaysia approval from the University's Research Committee.

INFORMED CONSENT STATEMENT

Informed consent was obtained from all subjects involved in the study.

DATA AVAILABILITY STATEMENT

Data can be provided upon contacting the first author and will be made available only academic requests.

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