Review

The "Intention-Behavior Gap" in Low-Carbon Travel: Psychological Mechanisms and Interventions

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Abstract: The persistent growth of tourism-related carbon emissions poses a significant challenge to global climate goals. Despite a marked increase in pro-environmental attitudes and a stated willingness among tourists to support sustainability, a substantial gap remains between their low-carbon travel intentions and actual behaviors. This review synthesizes existing literature to explore this "intention-behavior gap" in low-carbon tourism. We argue that the gap is not merely a result of insufficient awareness but is sustained by a complex interplay of internal psychological mechanisms and external contextual barriers. Key psychological drivers include cognitive dissonance and neutralization strategies, the contextual dominance of hedonic goals during tourism, and moral licensing effects. These are compounded by external factors such as infrastructural carbon lock-in, the "green premium" on sustainable options, and information asymmetry exacerbated by greenwashing. The paper subsequently evaluates promising behavioral interventions designed to bridge this gap. These include refined choice architecture strategies like "nudge+" and the use of anchors, enhanced carbon labeling focused on transparency and moral credibility, and the integration of emotional and social value into low-carbon offerings.

Keywords: intention-behavior gap; low-carbon travel; psychological barriers; sustainable tourism; choice architecture

1. Introduction

The steady increase in tourism's carbon emissions directly challenges the global net-zero emissions goal [1,2]. Projections indicate that global tourism emissions will triple by the year 2050 [3]. Despite a marked increase in public environmental awareness and the widespread promotion of "sustainable tourism," the sector's carbon footprint, particularly driven by the reliance on aviation, continues to expand rather than contract [4]. It must be acknowledged that the growth in tourism's carbon emissions is largely attributable to the expansion in tourist numbers and the sector's high energy intensity [5,6]. However, this reliance on volume growth makes the behavioral dimension even more critical [7]. Since limiting tourism demand globally is politically and economically unfeasible, the decarbonization of the sector relies heavily on a structural shift in tourist behavior, such as modal shifts from air to rail [8]. The persistence of the intention-behavior gap, therefore, represents a missed opportunity to decouple tourism growth from emissions.

This phenomenon presents a perplexing paradox in consumer psychology. While empirical studies consistently report that tourists express high levels of concern for the environment and a willingness to support sustainability, these pro-environmental attitudes rarely translate into actual low-carbon choices during vacations [9]. This discrepancy is widely recognized in academic literature as the "intention-behavior gap" or "attitude-behavior gap" [10]. Current research suggests that this gap is not merely a result of economic barriers or lack of infrastructure, but is deeply rooted in complex

psychological processes and contextual constraints [11]. Tourists often employ cognitive defense mechanisms to resolve the psychological discomfort, known as cognitive dissonance, caused by their high-carbon travel behaviors, effectively rationalizing their refusal to act [12]. Therefore, this review aims to synthesize existing literature on the intention-behavior gap in the context of low-carbon tourism. Specifically, it examines the underlying psychological mechanisms, such as moral licensing and denial of responsibility, and analyzes the external factors that inhibit consistent low-carbon behaviors [13,14]. By deconstructing these barriers, this paper seeks to provide a theoretical basis for designing more effective interventions to align tourist actions with their environmental values.

2. The landscape of Low-carbon Intentions

The contemporary academic landscape regarding low-carbon tourism is dominated by an optimistic narrative of high consumer willingness, even slightly exceeding the marginal damage cost of carbon estimated by most studies at the time, at least at the declaratory level [15]. Recent analysis indicates a consolidating trend where a significant majority of tourists express positive dispositions toward decarburization [16,17]. Specifically, empirical data from PricewaterhouseCoopers (PWC) found that despite the cost-of-living crisis, consumers were willing to spend 9.7% more for sustainably produced or sourced products [18]. This surge in reported WTP is often interpreted as a signal of a paradigm shift in consumer values, where environmental sustainability is no longer a niche preference but a core component of travel service quality.

To explain the formation of these pro-environmental intentions, researchers have extensively utilized socio-psychological frameworks. The Theory of Planned Behavior (TPB) remains the most widely applied theoretical lens in this domain [19]. Under the TPB framework, a tourist's intention to engage in low-carbon behaviors, such as using public transport or reducing waste, is predicted by their attitude toward the behavior, subjective norms, and perceived behavioral control [20-22]. Complementing the rational choice perspective of TPB, the Norm Activation Model (NAM) has been successfully deployed to capture the moral dimension of decision-making. Studies utilizing NAM postulate that the awareness of environmental consequences activates a sense of personal responsibility, which subsequently drives the moral obligation to act in an eco-friendly manner [23].

Although these models have demonstrated statistical efficacy in explaining tourists' intentions to engage in sustainable behavior, their predictive validity concerning actual behavior remains constrained [24]. While both the Theory of Planned Behavior (TPB) and the Norm Activation Model (NAM) often yield high R-squared values in predicting behavioral intention, they exhibit limited capacity to account for how such intentions are translated into tangible actions. A critical review of 513 articles published between 1999 and 2024 further indicates that this predictive shortcoming often originates from the TPB's dependence on self-reported measures, which are inadequate for capturing the complexity of behavior in real-world travel contexts. To better understand the drivers of genuine behavioral commitment, it is necessary to integrate insights from complementary disciplines, such as incorporating psychological explanatory frameworks when examining related topics [25].

3. Explaining the gap: Psychological Barriers

Although individual differences, such as the number of accompanying family members, traveler composition, and income, are significantly correlated with low-carbon behavior, the travel habits closely associated with low-carbon practices among most population groups [26,27] are shaped by the following three psychological mechanisms.

3.1. Cognitive Dissonance and the "Flyers' Dilemma"

The most pervasive barrier to low-carbon travel habit is the psychological conflict known as cognitive dissonance. This occurs when an individual holds a pro-environmental value but engages in carbon-intensive behavior, such as long-haul air travel. To resolve the resulting psychological discomfort without altering their behavior, tourists employ sophisticated neutralization techniques called the "Flyers' Dilemma" [28]. A pivotal study published in the Journal of Sustainable Tourism applies psychological reactance theory to tourist behavior and identifies that when faced with the threat of losing travel freedom due to climate change, tourists progressively engage in denial of the threat to rationalize their choices [29]. Unlike explanations centered on simple ignorance, the research suggests that tourists may be aware of climate impacts but actively deny the relevance or seriousness of the threat to their personal travel, which reflecting a deliberate dissociation from the problem and its solutions [30]. Many travelers suppress flight-related guilt by placing responsibility for aviation emissions on airlines rather than themselves [31]. Furthermore, tourists frequently use reduction of tension as a coping strategy, justifying their travel through self-exempting narratives such as "you only go on holiday once a year" or positioning themselves as environmental ambassadors who raise awareness by visiting threatened places [29]. This cognitive and behavioral adjustment allows the intention-behavior gap to persist because the tourist reasserts their freedom to travel and no longer perceives a conflict between their environmental identity and their actions.

3.2. Enjoyment Focus: The Hedonic Privilege

The second mechanism driving the gap is the contextual activation of hedonic goals over normative goals [32]. Tourism is inherently a liminal experience, characterized by a temporary suspension of everyday rules and obligations [33]. In this state of "enjoyment focus," the cognitive effort required to calculate carbon footprints or research sustainable transport options is perceived as a threat to the vacation experience [25]. A study demonstrates that even highly eco-conscious individuals undergo a psychological shift when transitioning from a "home mode" to a "holiday mode." In the holiday mode, the desire for convenience, luxury, and time maximization suppresses environmental values. Consequently, low-carbon choices that involve any degree of sacrifice, such as longer travel times by train or reduced comfort, are subconsciously rejected because they conflict with the primary goal of the trip, which is hedonism and escape.

3.3. Moral Licensing: The Compensatory Fallacy

The third and perhaps potentially more persistent mechanism is moral licensing, a phenomenon where performing a minor pro-environmental act provides the individual with a "license" to perform a subsequent harmful act [34,35]. In the context of tourism, this manifests as a compensatory logic. Tourists often engage in low-effort, low-impact behaviors, such as performing a morally virtuous act in daily life (cycling) people subconsciously use these actions to justify high-impact behaviors like flying internationally frequently [36]. Tourists perceive their "green account" as being in credit due to small symbolic gestures, leading to a reduced sense of guilt when making high-carbon transport choices. This psychological accounting creates a dangerous illusion of sustainability, where the accumulation of trivial eco-friendly actions is mistakenly believed to offset the massive carbon footprint of aviation, thereby widening the gap between perceived and actual environmental impact [37].

4. External Barriers & Contextual Factors

While psychological mechanisms explain the internal suppression of pro-environmental intentions, the translation of these intentions into behavior is frequently obstructed by tangible external constraints. Even the most eco-conscious tourists operate

within a tourism system characterized by structural carbon lock-in and market failures. This section analyzes the primary contextual barriers identified in recent literature, specifically the lack of low-carbon infrastructure, economic disincentives, and information asymmetry regarding sustainability claims.

4.1. Infrastructural Deficits and Carbon Lock-in

The most formidable barrier to low-carbon tourism is the physical lack of viable alternatives to high-carbon transport modes. Oil-related emissions increased by 2.5% in 2022, with the aviation sector accounting for roughly half of this growth [38]. And urban transportation is responsible for roughly 6% of global, human-made GHG emissions [39]. Theses phenomena, support the fact that described as "structural carbon lock-in," forces tourists into high-carbon behaviors regardless of their environmental values, which is a significant obstacle to achieving low-carbon travel [40]. Although High-Speed Rail (HSR) is often cited as a sustainable substitute, its network coverage remains geographically fragmented [41]. Consequently, the intention to travel sustainably is rendered moot by the physical unavailability of low-carbon supply chains, creating a "forced choice" scenario where the tourist must either fly or forego the trip entirely. In urban areas, facilities such as public transport coverage, connectivity, dedicated bike lanes, pedestrian-friendly infrastructure and new energy appliances are all key factors influencing urban carbon emissions [42]. These plans, which require adjusting urban transportation planning or extensive equipment upgrades to reduce carbon emissions, have an extremely low likelihood of implementation due to the great financial burden, thereby perpetuating a long-term lock-in of carbon emissions.

4.2. The "Green Premium" and Price Sensitivity

Economic factors continue to exert a dominant influence on travel decision-making. Despite the stated willingness to pay in surveys, actual purchasing behavior is highly price-elastic [43]. A critical impediment is the "Green Premium," which refers to the additional cost associated with sustainable options, such as flights using Sustainable Aviation Fuel (SAF) [44]. The most feasible SAF: biofuel costs more than twice as much as conventional jet fuels [45]. In an inflationary economic environment, this price disparity acts as a powerful deterrent [46]. Studies show that when faced with a trade-off between sustainability and affordability, the vast majority of mass-market tourists prioritize cost savings [47]. This price barrier effectively restricts low-carbon tourism to a luxury niche, preventing it from scaling to a mass-market solution necessary for significant emissions reductions.

4.3. Information Asymmetry and Greenwashing

Skepticism Even when affordable low-carbon options exist, tourists are often prevented from choosing them due to information failure [48]. The effectiveness of green marketing is fundamentally contingent upon building tourist trust [49]. They must be assured of both the validity of a brand's environmental assertions and its genuine, ongoing follow-through on those commitments [50,51]. The Australian Competition and Consumer Commission (2023) reports that 57% of businesses surveyed issue misleading environmental claims, intensifying customer accusations of greenwashing [52]. This information asymmetry breeds cynicism. Tourists, suspecting that their efforts might be futile or that they are being manipulated by corporate marketing, often default to conventional choices, viewing the search for credible low-carbon options as cognitively burdensome and risky.

5. Bridging the Gap: Mitigation Strategies

Given the resilience of psychological barriers and the slow pace of infrastructural change, recent scholarship has increasingly pivoted toward behavioral interventions

designed to "bridge" the intention-behavior gap. Rather than relying solely on environmental education, which has proven insufficient, researchers are exploring how altering the choice architecture can steer tourists toward lower-carbon decisions. This section reviews two prominent strategies debated in the literature from 2021 to 2025: the application of nudging theory, specifically default options, and the efficacy of carbon labeling.

5.1. Managing Choices

Nudging, defined as a subtle change in the choice environment that alters behavior without forbidding any options, has emerged as a powerful tool on tourist's preference for carbon mitigation [53]. However, Nudges, often implemented through default options, are commonly used to guide individuals toward making better decisions but are frequently criticized for failing to induce long-term change [54]. A 2025 study introduced reflective prompts to the nudge framework termed nudge +: demonstrated a 15% higher efficacy compared to the nudge-only condition, indicating that the incorporation of reflective elements enhances the effectiveness of the nudge intervention [55-57].

Besides, the anchoring effect offers a refined intervention for green travel decision making [58]. Research on CO_2 vs. travel time tradeoffs demonstrates that while normative information alone is insufficient, combining it with a high anchor (e.g., ">6 hours") significantly increases willingness to accept longer, low-carbon journeys compared to a low anchor. This synergy is explained by the Selective Accessibility Model, where the high anchor, when paired with normative context, activates cognitive features related to meaningful sacrifice, making the choice seem more justifiable [59]. This effect is strongest among individuals with high environmental concern. For practice, travel platforms can leverage this by prominently presenting rail travel times (a high anchor) alongside emissions data and carbon budget norms, creating a choice architecture that directly targets the psychological trade-off and helps bridge the intention-behavior gap.

5.2. The Efficacy of Carbon Certificate Mechanism

Parallel to nudge+, carbon certificates aims to mitigate information asymmetry by making the environmental cost of travel visible which is also exerts a favorable impact on income efficiency. [60]. The design features of a carbon label, including its imagery, color, size, and placement on the product, can significantly influence its visual attention and appeal, comprehensibility, and ultimately user engagement, however, the importance of these different design features often varies across product types, decision-making environments, and the deliberateness of the decision process [61]. Therefore, prioritizing the labeling of content that consumers care about most is of paramount importance. Compared to carbon offsetting, emission reduction is morally preferable: in a 2025 experiment, direct emission reduction consistently received higher moral credit, moral credentials, more positive corporate attitudes, and greater purchase intention than carbon offsetting. Therefore, regardless of the type of carbon label used, to prioritize transparency and substantive communication, labeling should emphasize the actual efforts in emission reduction and the resulting co-benefits (such as community development and biodiversity conservation), rather than merely stating how much carbon has been offset [62].

5.3. Emotional Value

Furthermore, green practices need to fulfill the emotional value of the public, such as incorporating hedonic elements. Research shows that in the promotion of green transportation tools-shared electric bicycles and shared electric scooters-factors like the joy of riding and fun experiences can be integrated to make them more appealing [63]. Meanwhile, a 2022 study targeting young people indicated that when youth engage in environmental actions alongside their peers, they derive pleasure from social interactions. On a personal level, these young individuals only feel satisfied after personally

participating in environmental cleanup efforts and seeing a clean environment. This highlights the social attributes and emotional value of low-carbon behaviors. Therefore, broadening the scope of emotional value that low-carbon practices can provide is key to promoting such initiatives.

6. Conclusion & Future Research

In conclusion, this review establishes that the intention-behavior gap in low-carbon tourism is not merely a symptom of insufficient environmental awareness but a structural deadlock sustained by deep-seated psychological defense mechanisms and external market failures. While tourists exhibit a theoretical willingness to decarbonize, their actual behavior is frequently neutralized by cognitive dissonance, hedonic prioritization, and the lack of viable infrastructure. A critical examination of the reviewed literature reveals a significant methodological limitation. The vast majority of existing studies rely heavily on self-reported data derived from surveys, which are inherently susceptible to social desirability bias. This reliance has created a "positivity bias" in the literature, where the magnitude of the gap is likely underestimated because respondents overstate their pro-environmental actions to align with social norms.

Consequently, future research must pivot from analyzing stated intentions to tracking objective behavior. Rather than asking tourists what they would do, scholars should leverage big data analytics and Real-time AI Carbon Feedback from wearable devices, to measure actual consumption patterns and carbon emissions. Furthermore, Innovative technologies like biometrics, experimental methods, and longitudinal tracking strengthen behavioral models by providing real-time, objective data should be invited to this field.

References

1. Y. Y. Sun, S. Gossling, and W. Zhou, "Does tourism increase or decrease carbon emissions? A systematic review," Annals of Tourism Research, vol. 97, p. 103502, 2022.
2. M. Lenzen, Y. Y. Sun, F. Faturay, Y. P. Ting, A. Geschke, and A. Malik, "The carbon footprint of global tourism," Nature climate change, vol. 8, no. 6, pp. 522-528, 2018.
3. H. Liu, C. Wang, and H. Tsai, "Enhancing tourism carbon emission efficiency through industry agglomeration: Evidence from China," Tourism Management, vol. 110, p. 105170, 2025. doi: 10.1016/j.tourman.2025.105170
4. S. Gössling, and J. Higham, "The low-carbon imperative: Destination management under urgent climate change," Journal of Travel Research, vol. 60, no. 6, pp. 1167-1179, 2021. doi: 10.1177/0047287520933679
5. C. Tang, L. Zhong, and P. Ng, "Factors that influence the tourism industry's carbon emissions: A tourism area life cycle model perspective," Energy Policy, vol. 109, pp. 704-718, 2017. doi: 10.1016/j.enpol.2017.07.050
6. Y. Y. Sun, F. Faturay, M. Lenzen, S. Gössling, and J. Higham, "Drivers of global tourism carbon emissions," Nature Communications, vol. 15, no. 1, p. 10384, 2024.
7. L. Wang, J. Wang, P. Shen, S. Liu, and S. Zhang, "Low-carbon travel behavior in daily residence and tourism destination: based on TPB-ABC integrated model," Sustainability, vol. 15, no. 19, p. 14349, 2023. doi: 10.3390/su151914349
8. S. Gössling, and S. Dolnicar, "A review of air travel behavior and climate change," Wiley Interdisciplinary Reviews: Climate Change, vol. 14, no. 1, p. e802, 2023. doi: 10.1002/wcc.802
9. B. Lin, and X. Wang, "Does low-carbon travel intention really lead to actual low-carbon travel? Evidence from urban residents in China," Economic Analysis and Policy, vol. 72, pp. 743-756, 2021. doi: 10.1016/j.eap.2021.10.010
10. P. Sheeran, and T. L. Webb, "The intention-behavior gap," Social and personality psychology compass, vol. 10, no. 9, pp. 503-518, 2016. doi: 10.1111/spc3.12265
11. Y. Zhang, C. Xiang, Y. Huang, Q. Du, Y. Mao, and H. Lu, "Understanding the intention-behavior gap in sustainable travel: a two-step approach," Journal of Sustainable Tourism, pp. 1-22, 2025.
12. J. De Vos, and P. A. Singleton, "Travel and cognitive dissonance," Transportation Research Part A: Policy and Practice, vol. 138, pp. 525-536, 2020. doi: 10.1016/j.tra.2020.06.014

13. A. M. Burger, J. Schuler, and E. Eberling, "Guilty pleasures: Moral licensing in climate-related behavior," Global Environmental Change, vol. 72, p. 102415, 2022. doi: 10.1016/j.gloenvcha.2021.102415

14. S. Stoll-Kleemann, and T. O'Riordan, "Revisiting the psychology of denial concerning low-carbon behaviors: From moral disengagement to generating social change," Sustainability, vol. 12, no. 3, p. 935, 2020.

15. R. Brouwer, L. Brander, and P. Van Beukering, ""A convenient truth": air travel passengers' willingness to pay to offset their CO_2 emissions," Climatic change, vol. 90, no. 3, pp. 299-313, 2008. doi: 10.1007/s10584-008-9414-0

16. J. Geng, N. Yang, L. Yang, and R. Long, "Public willingness to pay for personal carbon trading of green travel: based on survey data from five capital cities in eastern China," Frontiers in Ecology and Evolution, vol. 11, p. 1269584, 2023. doi: 10.3389/fevo.2023.1269584

17. D. Damigos, "How much are consumers willing to pay for a greener hotel industry? A systematic literature review," Sustainability, vol. 15, no. 11, p. 8775, 2023. doi: 10.3390/su15118775

18. J. Thaker, "Corporate Communication about Climate Change: Villains, Victims, and White Knights," Taylor & Francis, 2025.

19. C. Liao, Y. Huang, Z. Zheng, and Y. Xu, "Investigating the factors influencing urban residents' low-carbon travel intention: A comprehensive analysis based on the TPB model," Transportation research interdisciplinary perspectives, vol. 22, p. 100948, 2023. doi: 10.1016/j.trip.2023.100948

20. C. J. Armitage, and M. Conner, "Efficacy of the theory of planned behaviour: A metaanalytic review," British journal of social psychology, vol. 40, no. 4, pp. 471-499, 2001. doi: 10.1348/014466601164939

21. C. Liao, X. Zhan, and Y. Huang, "Understanding the effect of proactive personality and perceived consumer effectiveness on low-carbon travel intention," Heliyon, vol. 9, no. 9, 2023. doi: 10.1016/j.heliyon.2023.e19321

22. I. Ajzen, "The theory of planned behavior," Organizational behavior and human decision processes, vol. 50, no. 2, pp. 179-211, 1991.

23. G. Adu-Gyamfi, E. Nketiah, L. Li, and H. Sun, "An empirical study of Chinese consumers' green low carbon transportation commuting based on NAM and TPB model," Journal of Industrial Relations, vol. 46, pp. 1-24, 2021.

24. T. M. Wut, D. Lee, and S. W. Lee, "Does attitude or intention affect behavior in sustainable tourism? A review and research agenda," Sustainability, vol. 15, no. 19, p. 14076, 2023. doi: 10.3390/su151914076

25. K. Esfandiar, and A. Hadinejad, "A critical review of the theory of planned behaviour in tourism research," Current Issues in Tourism, pp. 1-15, 2025.

26. P. Zhao, L. Wei, D. Pan, J. Yang, and Y. Ji, "Analysis of key factors affecting low-carbon travel behaviors of urban residents in developing countries: A case study in Zhenjiang, China," Sustainability, vol. 15, no. 6, p. 5375, 2023. doi: 10.3390/su15065375

27. M. Wang, C. Zhang, M. Huang, X. Lu, and W. Wang, "Green travel behavior in China's dual carbon context," Transportation Safety and Environment, 2025.

28. T. Harris, and K. Daniels, "Calibrating Consumption: Flyers' Dilemmas in the Age of the Low-Cost Carrier," In Low-Cost Aviation, 2022, pp. 195-211.

29. X. Font, and A. Hindley, "Understanding tourists' reactance to the threat of a loss of freedom to travel due to climate change: A new alternative approach to encouraging nuanced behavioural change," Journal of Sustainable Tourism, vol. 25, no. 1, pp. 26-42, 2017. doi: 10.1080/09669582.2016.1165235

30. J. Higham, and M. Young, "The Flyers' Dilemma: Confronting the Negative Psychological Effects of Air Passenger Travel," Channel View Publications, 2022. doi: 10.2307/jj.22679731.11

31. S. McDonald, C. J. Oates, M. Thyne, A. J. Timmis, and C. Carlile, "Flying in the face of environmental concern: Why green consumers continue to fly," Journal of Marketing Management, vol. 31, no. 13-14, pp. 1503-1528, 2015. doi: 10.1080/0267257x.2015.1059352

32. P. J. Flores, and J. Jansson, "Being innovative, fun, and green? Hedonic and environmental motivations in the use of green innovations," Journal of Marketing Management, vol. 38, no. 17-18, pp. 1907-1936, 2022. doi: 10.1080/0267257x.2022.2062426

33. S. A. Cohen, J. E. Higham, and A. C. Reis, "Sociological barriers to developing sustainable discretionary air travel behaviour," Journal of Sustainable Tourism, vol. 21, no. 7, pp. 982-998, 2013. doi: 10.1080/09669582.2013.809092

34. I. Blanken, N. Van De Ven, and M. Zeelenberg, "A meta-analytic review of moral licensing," Personality and Social Psychology Bulletin, vol. 41, no. 4, pp. 540-558, 2015.

35. D. Kaklamanou, C. R. Jones, T. L. Webb, and S. R. Walker, "Using public transport can make up for flying abroad on holiday: compensatory green beliefs and environmentally significant behavior," Environment and Behavior, vol. 47, no. 2, pp. 184-204, 2015.

36. M. Kroesen, and M. Mehdizadeh, "Spill-over effects between daily and air travel behavior: a panel analysis," 2024. doi: 10.21203/rs.3.rs-4460545/v1

37. Y. Wang, and Y. Ni, "Airport slot allocation with low-carbon consideration," Transportation Research Part E: Logistics and Transportation Review, vol. 196, p. 104009, 2025. doi: 10.1016/j.tre.2025.104009

38. A. Javaid, F. Creutzig, and S. Bamberg, "Determinants of low-carbon transport mode adoption: systematic review of reviews," Environmental Research Letters, vol. 15, no. 10, p. 103002, 2020. doi: 10.1088/1748-9326/aba032

39. C. Zhao, "Can industrial structure optimization and industrial structure transition both lead to carbon lock-in mitigation? The case of China," Environmental Science and Pollution Research, vol. 31, no. 15, pp. 23247-23261, 2024. doi: 10.1007/s11356-024-32609-2

40. H. He, H. Wang, and S. Wang, "High-speed rail network and regional carbon emissions: Carbon lock-in or unlocking?," Transport Policy, vol. 164, pp. 144-159, 2025. doi: 10.1016/j.tranpol.2025.01.037

41. Z. Hu, and Y. Xu, "Can new energy demonstration cities break through the multiple carbon lock-in? Evidence based on double machine learning," Energy Policy, vol. 199, p. 114522, 2025. doi: 10.1016/j.enpol.2025.114522

42. A. Dichter, K. Henderson, R. Riedel, and D. Riefer, "How airlines can chart a path to zero-carbon flying," McKinsey & Company, vol. 13, 2020.

43. C. Chen, D. Zhang, L. Zhu, and F. Zhang, "Promoting green choices: How price premium displays influence consumer preference for green products," Resources, Conservation and Recycling, vol. 207, p. 107682, 2024. doi: 10.1016/j.resconrec.2024.107682

44. N. A. Qasem, A. Mourad, A. Abderrahmane, Z. Said, O. Younis, K. Guedri, and L. Kolsi, "A recent review of aviation fuels and sustainable aviation fuels," Journal of Thermal Analysis and Calorimetry, vol. 149, no. 10, pp. 4287-4312, 2024.

45. Y. Chen, J. Zhang, and H. Chen, "An economic analysis of sustainable tourism development in China," Economic Change and Restructuring, vol. 56, no. 4, pp. 2227-2242, 2023. doi: 10.1007/s10644-023-09512-w

46. S. Suhardono, T. T. T. Phan, C. H. Lee, and I. W. K. Suryawan, "Design strategies and willingness to pay for circular economy service policies in sustainable tourism," Environmental Challenges, vol. 18, p. 101081, 2025.

47. A. Alhomaid, "Building Trust in Sustainable Journeys: The Interplay Between Green Marketing, Green Brand Trust, and Tourism Purchase Intentions," Sustainability, vol. 17, no. 18, p. 8464, 2025. doi: 10.3390/su17188464

48. P. Hatamifar, K. Tervo-Kankare, and Z. Ghaderi, "The interplay of dual awareness in shaping carbon-neutral travel behavior among young adults," Scandinavian Journal of Hospitality and Tourism, vol. 25, no. 5, pp. 476-495, 2025. doi: 10.1080/15022250.2025.2593818

49. H. Zameer, Y. Wang, and H. Yasmeen, "Strengthening green competitive advantage through organizational learning and green marketing capabilities in a big data environment: a moderated-mediation model," Business Process Management Journal, vol. 30, no. 6, pp. 2047-2072, 2024. doi: 10.1108/bpmj-09-2023-0691

50. U. Akram, R. Lavuri, M. Bilal, I. Hameed, and J. Byun, "Exploring the roles of green marketing tools and green motives on green purchase intention in sustainable tourism destinations: a cross-cultural study," Journal of Travel & Tourism Marketing, vol. 41, no. 4, pp. 453-471, 2024. doi: 10.1080/10548408.2023.2293022

51. F. Shishan, S. Majeed, R. Nimri, Z. Qasem, and H. Millanyani, "Green hotels and greener choices: Impact of environmental claims on traveler perceptions," Journal of Vacation Marketing, 2025. doi: 10.1177/13567667251401238

52. H. Song, H. Wu, and H. Zhang, "Can nudging affect tourists' low-carbon footprint travel choices?," International journal of contemporary hospitality management, vol. 36, no. 5, pp. 1534-1556, 2024. doi: 10.1108/ijchm-09-2022-1175

53. E. Avineri, "On the use and potential of behavioural economics from the perspective of transport and climate change," Journal of Transport Geography, vol. 24, pp. 512-521, 2012. doi: 10.1016/j.jtrangeo.2012.03.003

54. S. Banerjee, and P. John, "Nudge plus: incorporating reflection into behavioral public policy," Behavioural Public Policy, vol. 8, no. 1, pp. 69-84, 2024.

55. P. John, and G. Stoker, "Rethinking the role of experts and expertise in behavioural public policy," Policy & Politics, vol. 47, no. 2, pp. 209-225, 2019. doi: 10.1332/030557319x15526371698257

56. J. M. Yachin, L. Margaryan, M. Lexhagen, and D. Ioannides, "Nudge plus in tourism: reflexive behaviours and reflective attitudes," Journal of Sustainable Tourism, vol. 33, no. 12, pp. 2773-2790, 2025. doi: 10.1080/09669582.2024.2436907

57. J. Sonnenschein, and N. Smedby, "Designing air ticket taxes for climate change mitigation: insights from a Swedish valuation study," Climate Policy, vol. 19, no. 5, pp. 651-663, 2019. doi: 10.1080/14693062.2018.1547678

58. F. Bökman, H. Andersson, P. Sörqvist, and U. Ahonen-Jonnarth, "The psychology of balancing gains and losses for self and the environment: Evidence from a carbon emission versus travel time tradeoff task," Journal of Environmental Psychology, vol. 74, p. 101574, 2021. doi: 10.1016/j.jenvp.2021.101574

59. A. Arbelo, M. Arbelo-Pérez, V. De Vera, and A. Bilgihan, "Green premiums: assessing the revenue impact of eco-certification in the hospitality sector," International Journal of Contemporary Hospitality Management, vol. 37, no. 13, pp. 64-83, 2025. doi: 10.1108/ijchm-04-2024-0534

60. K. M. Taufique, K. S. Nielsen, T. Dietz, R. Shwom, P. C. Stern, and M. P. Vandenbergh, "Revisiting the promise of carbon labelling," Nature Climate Change, vol. 12, no. 2, pp. 132-140, 2022.

61. H. Chu, and S. Yuan, "Carbon credit does not buy moral credit: moral licensing and perceived hypocrisy of carbon emission offsetting and reduction," Climatic Change, vol. 178, no. 3, p. 48, 2025. doi: 10.1007/s10584-025-03897-5

62. E. C. Vogt, "Contributions towards closing the intention-behavior gap in residential low-carbon technology adoption decisions," 2024.

63. N. T. C. T. Moi, and M. Harun1, "Exploring Hedonistic Values Aspects in Pro-environmental Behaviour Among Young," In Proceedings of the 8th International Conference on Communication and Media 2022 (i-COME 22), August, 2023, p. 268.