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Low-Carbon Consumer Behavior in the Digital Age: Investigating the Determinants of Green Product Purchase Intentions in E-Commerce Platforms

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ABSTRACT

Digital commerce is reshaping how consumers discover, evaluate, and purchase products, creating new opportunities to encourage lower-carbon consumption while also intensifying convenience-driven consumption and information overload. This article examines the determinants of green product purchase intention in e-commerce by integrating behavioral, value-based, trust-based, and digital-information perspectives. It develops an integrative conceptual framework that links environmental concern, attitudes toward green products, subjective norms, perceived behavioral control, green perceived value, price perceptions, green trust, digital information quality, electronic word of mouth, platform affordances, and perceived greenwashing to purchase intention. The article uses a structured integrative review of recent research and authoritative sustainability reports, emphasizing studies published from 2021 onward while retaining established theories where needed to explain underlying mechanisms. The synthesis indicates that pro-environmental concern is important but rarely sufficient on its own: consumers must also believe that a product performs well, offers acceptable value, can be purchased without excessive effort, and is supported by credible evidence. Digital interfaces may reduce information costs through certification details, traceability, reviews, and product comparisons, yet they can also amplify unsubstantiated environmental claims and impulsive purchasing. Green trust and perceived information usefulness therefore emerge as central mechanisms connecting digital communication to intention, while price sensitivity, perceived risk, delivery impacts, and doubts about green claims can weaken the relationship.

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1. INTRODUCTION

Climate change and resource depletion have made consumption patterns a strategic concern for firms, policymakers, and households. Although production-side innovation and energy-system transformation are essential, demand-side choices also influence emissions through product selection, use, replacement, packaging, delivery, and disposal. Consumer behavior is therefore relevant not only to environmental policy but also to marketing strategy and the design of digital retail ecosystems. The challenge is not simply to persuade consumers to express concern about the environment; it is to make lower-impact choices credible, attractive, accessible, and practical at the moment of purchase. Recent reviews show that green purchase intention is associated with a combination of cognitive, personal, and social factors rather than one universal driver (Zhuang et al., 2021; Sharma et al., 2023; Barbu et al., 2022).

E-commerce has changed the context in which these choices occur. Search engines, marketplaces, social commerce, recommendation systems, influencer content, and customer reviews can make sustainability information more visible than it was in conventional retail. A consumer can compare product descriptions, examine certifications, read other buyers' experiences, and evaluate prices without visiting multiple physical stores. Digital channels can also lower search costs for niche products such as refillable household goods, recycled-material apparel, energy-efficient devices, and reusable personal-care items. Studies of social media and green consumption suggest that information quality, marketing activity, and trust can shape consumers' willingness to consider environmentally preferable products (Nekmahmud et al., 2022; Wu & Long, 2024; Zhao et al., 2024).

However, digital availability does not automatically produce low-carbon behavior. E-commerce may encourage rapid replacement, impulse buying, split shipments, excessive packaging, and high-return shopping. A product marketed as "green" may have lower impacts in one lifecycle stage but higher impacts elsewhere. Consumers often cannot independently verify claims about recycled content, production emissions, durability, repairability, or labor and sourcing practices. This creates information asymmetry between sellers and buyers and raises the risk that sustainability messaging becomes a persuasive signal rather than a reliable description of environmental performance. Greenwashing research highlights the importance of claim credibility and authenticity, especially when environmental messages circulate through social media and brand-owned channels (Fang, 2024).

The central problem addressed here is that research on green purchase intention has identified many relevant antecedents, yet these factors are frequently examined in separate models or in general green-product settings. The digital shopping environment introduces specific mechanisms—interface design, review systems, information usefulness, platform reputation, traceability, and algorithmic recommendations—that can alter how consumers interpret environmental attributes. At the same time, low-carbon consumption is broader than purchasing a product with an eco-label. It includes the possibility of buying less, choosing durable goods, selecting lower-impact delivery, using products longer, and disposing of them responsibly. An account focused only on stated purchase intention risks overlooking the difference between symbolic green consumption and lifecycle-oriented choices (Wibowo et al., 2022; Barbu et al., 2022; Londoño et al., 2024).

This article addresses three connected gaps. First, it integrates established behavioral predictors with digital-specific conditions in one framework, rather than treating e-commerce merely as a distribution channel. Second, it distinguishes green perceived value from green trust: consumers may believe a product is environmentally beneficial but remain uncertain whether the seller's claim is truthful, or they may trust the seller without seeing sufficient functional value. Third, it treats price sensitivity, information asymmetry, perceived greenwashing, and the wider consumption consequences of digital convenience as boundary conditions rather than peripheral concerns. These distinctions extend the synthesis of green purchase research by focusing on the mechanisms through which digital platforms may strengthen or weaken consumer intention (Wibowo et al., 2022; Sharma et al., 2023; Londoño et al., 2024).

The purpose is to develop an integrative conceptual explanation of green product purchase intention in e-commerce platforms and derive a research agenda suitable for marketing and consumer-behavior scholarship. The article asks: (1) Which psychological, value-related, social, and digital-information factors are most plausibly associated with green purchase intention in e-commerce? (2) How do green trust and perceived information usefulness translate digital sustainability information into intention? (3) Under what conditions do price sensitivity, perceived risk, greenwashing concerns, and platform design weaken or strengthen these relationships? (4) How can marketers encourage lower-carbon consumption without turning sustainability into a superficial promotional cue? The contribution is conceptual and analytical: it synthesizes recent literature, proposes hypotheses for subsequent testing, and identifies implications for responsible digital marketing (Sharma et al., 2023; Yusoff et al., 2023).

2. LITERATURE REVIEW

The article adopts a structured integrative literature-review approach. An integrative review is appropriate when a research problem spans multiple theoretical traditions and study designs and when the objective is to connect insights into a coherent explanatory framework rather than estimate a single pooled effect. The evidence base is oriented toward peer-reviewed work published from 2021 onward on green purchase intention, environmental concern, green trust, perceived green value, digital marketing, social commerce, online information, electronic word of mouth, and greenwashing. Relevant review studies and meta-analytic evidence are used to identify recurrent constructs and inconsistencies, while empirical studies are used to explain mechanisms in particular contexts. Authoritative reports on climate change, consumption, and digital commerce provide context rather than substitute for peer-reviewed behavioral evidence (Sharma et al., 2023; Barbu et al., 2022; Wibowo et al., 2022).

The review is analytical rather than a fully reproducible systematic review. It does not claim that every relevant paper was captured, nor does it report a fabricated screening count or meta-analytic effect size. Studies were interpreted according to their conceptual relevance to the focal outcome, the context in which the proposed relationship operates, and the degree to which findings can be transferred to e-commerce. Particular attention was paid to whether a study measured intention, self-reported behavior, or observed behavior, because these outcomes are not interchangeable. The review also distinguishes direct antecedents from mediators and moderators. This distinction matters because a factor may not independently predict intention but may shape how consumers process other cues (Paul & Criado, 2021).

Several limitations follow from this approach. First, the literature is heterogeneous in its definitions of green products, sustainability claims, sampling frames, and measures of purchase intention. Second, much of the available research uses cross-sectional self-report surveys, which can be affected by social desirability, common-method variance, and the intention–behavior gap. Third, findings from one national market or product category may not transfer to another because income, environmental regulation, cultural norms, infrastructure, and consumer trust differ. These limitations are not reasons to disregard the literature; rather, they make it necessary to avoid presenting green purchase intention as a universal, context-free response.

2.1 Theoretical foundations

The Theory of Planned Behavior (TPB) provides a useful baseline because it explains intention through attitude, subjective norm, and perceived behavioral control. In green consumption, attitude captures the extent to which consumers evaluate purchasing an environmentally preferable product favorably; subjective norm captures perceived approval from relevant others; and perceived behavioral control reflects whether consumers believe that they have the resources and ability to complete the purchase. Recent empirical synthesis supports the continuing relevance of these constructs while showing that their effects coexist with green value, trust, perceived risk, and other variables (Zhuang et al., 2021; Sharma et al., 2023). In e-commerce, perceived control includes not only affordability and availability but also the ability to interpret labels, compare claims, understand delivery options, and navigate checkout.

TPB is valuable but incomplete for this setting. Its constructs do not fully explain how platform architecture structures attention or how consumers assess the credibility of seller-generated environmental claims. Nor does a favorable attitude necessarily mean that a consumer has enough evidence to distinguish a genuinely lower-impact product from a conventional alternative with attractive green language. The framework should therefore be extended, not abandoned. Environmental concern can help explain why sustainability matters to a consumer, while green perceived value and trust explain whether a particular offer is considered worthwhile and credible (Nekmahmud et al., 2022; Sun et al., 2022).

Perceived value refers to the consumer's overall assessment of benefits relative to sacrifices. For green products, the benefits may include environmental performance, product quality, health, durability, identity, social approval, and emotional satisfaction. Sacrifices include price, search effort, uncertainty, limited availability, and perceived performance compromise. Research on green perceived value and green purchase intention indicates that consumers are more willing to buy when they believe the product delivers meaningful functional and environmental benefits (Hudayah et al., 2023; Hoang & Le Thanh, 2024). This suggests that sustainability claims are unlikely to compensate indefinitely for weak quality or poor value. Green products must be positioned as credible consumer solutions, not merely as moral choices.

Value-based reasoning also helps explain why price premiums can be accepted by some consumers but rejected by others. A premium may be justified when environmental benefits are tangible, independently supported, and aligned with a consumer's identity or practical needs. Yet consumers facing budget constraints may regard the same premium as a barrier, even when they are environmentally concerned. In addition, the price comparison displayed on an e-commerce page can make the sacrifice especially salient. A platform that shows a conventional product beside a green alternative may help consumers compare attributes, but it may also foreground price differences and reduce attention to lifecycle value. Price sensitivity should therefore be understood as a contextual condition, not simply as a stable personal trait (Joshi et al., 2021; Hudayah et al., 2023; Hoang & Le Thanh, 2024).

Norm activation and values. Norm-based perspectives explain why awareness of environmental consequences and a sense of personal responsibility can motivate pro-environmental choices. Consumers may feel a moral obligation to reduce waste, avoid unnecessary emissions, or support responsible producers. Yet moral motivation is often mediated by perceived efficacy: people are more likely to act when they believe that their choice can make a meaningful difference. In a digital marketplace, a consumer may question whether one purchase matters, whether the environmental claim is credible, or whether a more sustainable option is actually available. Communication should therefore connect environmental consequences with specific, verifiable product attributes and feasible actions rather than rely only on guilt or generalized appeals.

Environmental quality is often difficult to observe before purchase and sometimes difficult to verify even after use. Sellers possess more information about sourcing, production, packaging, and certification than consumers do. Labels, third-party certification, transparent product pages, traceability tools, and credible reviews can serve as signals that reduce uncertainty. But signals work only when consumers believe they are costly or difficult to imitate deceptively. A vague badge created by the seller may carry little evidentiary weight; a recognized certification with accessible criteria may carry more. Green trust is thus not merely liking a brand. It is the consumer's willingness to rely on environmental claims despite incomplete information. Digital information can improve trust when it is consistent, comprehensible, and verifiable, but it can undermine trust when claims appear exaggerated or contradictory (Wu & Long, 2024; Fang, 2024).

E-commerce platforms are not neutral containers. Ranking algorithms, sponsored placements, filters, default settings, product badges, review displays, and checkout prompts influence which attributes receive attention. Digital affordances can reduce friction by making environmental information searchable and comparable. They can also encourage cognitive shortcuts, whereby a consumer uses a green label, influencer endorsement, or high rating as a substitute for deeper evaluation. Social media research shows that the type of influencer and the style of endorsement can affect trust and green consumption intentions (Zhao et al., 2024). Consequently, a digital model must consider the interaction between consumer predispositions and the design of the information environment.

2.2 Conceptual model and hypothesis development

Environmental concern reflects the degree to which consumers recognize environmental problems and care about their consequences. It can motivate consumers to search for alternatives and evaluate green products favorably. However, concern does not guarantee purchase intention because consumers also consider product performance, affordability, and the credibility of environmental claims. The relationship is expected to be stronger when consumers can connect a product's attributes with a specific environmental benefit. When sustainability language is vague or difficult to verify, environmental concern may instead heighten skepticism. Accordingly, environmental concern is expected to be positively associated with green product purchase intention, with part of its influence operating through attitudes and perceived value. **H1:** Environmental concern is positively associated with green product purchase intention on e-commerce platforms.

A favorable attitude toward green products should increase intention because consumers expect positive consequences from the purchase. Subjective norms can reinforce intention when family, peers, communities, or influential digital creators treat sustainable consumption as desirable. Nevertheless, visible social approval may produce symbolic compliance rather than sustained behavior if the consumer lacks resources or confidence. Perceived behavioral control should be particularly important in e-commerce because consumers must be able to locate a suitable product, assess its claims, pay the price, and receive it under acceptable conditions. **H2:** Attitude toward green products is positively associated with purchase intention. **H3:** Subjective norms are positively associated with purchase intention. **H4:** Perceived behavioral control is positively associated with purchase intention.

Consumers are unlikely to choose a green product solely because it is environmentally preferable if they believe that it performs poorly or offers insufficient overall value. Green perceived value captures the combined assessment of environmental and functional benefits relative to monetary and non-monetary sacrifices. In digital retail, product comparisons and detailed specifications may help consumers identify

value, but the presentation must be comprehensible and not overstate the precision of environmental metrics. **H5:** Green perceived value is positively associated with green product purchase intention.

Trust should help translate sustainability information into purchase intention because online consumers often cannot inspect a product's production process directly. Trust can be directed toward the product claim, seller, certification, platform, or review community; these objects of trust should not be treated as identical. A reputable platform can reduce transaction risk, but platform reputation alone cannot prove that an environmental claim is accurate. Similarly, a trusted brand can still communicate weak evidence. The framework proposes that green trust positively predicts intention and mediates the relationship between digital information quality and intention. **H6:** Green trust is positively associated with green product purchase intention. **H7:** Green trust mediates the positive relationship between perceived digital sustainability-information quality and purchase intention.

Consumers face an abundance of online information, so the amount of information is not equivalent to its usefulness. Useful information is relevant to the decision, understandable, sufficiently specific, internally consistent, and actionable. For green products, useful information may include material composition, repairability, expected lifespan, packaging, delivery options, certifications, and the basis of carbon or environmental claims. Electronic word of mouth can supply experiential evidence about durability, product performance, and whether the item matches its description. Yet reviews may be manipulated, unrepresentative, or focused on service speed rather than environmental performance. **H8:** Perceived usefulness of digital sustainability information is positively associated with green trust. **H9:** Credible green-related electronic word of mouth is positively associated with purchase intention, partly through trust.

Price sensitivity may weaken the relationship between green perceived value and purchase intention when consumers place strong weight on immediate monetary sacrifice. This moderation is unlikely to be uniform: consumers may tolerate a premium for durable, high-performing, or health-relevant products but reject a premium when the environmental benefit is abstract. Perceived risk also matters. Consumers may fear poor quality, misleading claims, hidden costs, delivery damage, or limited returns. The negative effect of perceived risk may be particularly strong when the product's environmental advantage cannot be verified. **H10:** Price sensitivity weakens the positive relationship between green perceived value and purchase intention. **H11:** Perceived green risk is negatively associated with purchase intention.

Greenwashing occurs when communication creates an inflated or misleading impression of environmental performance. Online environments can amplify greenwashing because short descriptions and visual badges simplify complex claims, while recommendation algorithms may reward engagement rather than accuracy. If consumers perceive a claim as exaggerated, their skepticism can extend beyond the individual product to the brand or platform. **H12:** Perceived greenwashing is negatively associated with green trust and purchase intention. **H13:** Platform credibility strengthens the positive relationship between digital sustainability-information quality and green trust.

Platform features can reduce the effort required to select lower-impact options. Filters for verified certifications, repairability, recycled content, refill availability, or consolidated delivery can make sustainability attributes more actionable. Default settings may also influence behavior, but defaults must be transparent and avoid misleading consumers about environmental outcomes. A "green delivery" option should specify what makes it lower impact and whether slower delivery enables consolidation, rather than imply that any delivery labeled green is automatically superior. **H14:** Sustainability-oriented platform affordances are positively associated with perceived behavioral control and purchase intention. **H15:** The positive effect of environmental concern on intention is stronger when sustainability information is credible and easy to compare.

The proposed framework places green purchase intention at the center of a multilevel process. At the individual level, environmental concern, attitude, subjective norms, and perceived behavioral control describe motivations and perceived capacity. At the product-evaluation level, green perceived value and perceived risk capture the trade-off between benefits and sacrifices. At the information level, usefulness, electronic word of mouth, certification transparency, and platform credibility shape whether claims are considered trustworthy. At the market-interface level, price sensitivity, recommendation design, search filters, and delivery options determine whether the intended behavior is practical. Green trust connects the

information environment to the consumer's willingness to rely on claims, while perceived greenwashing acts as a corrosive influence that can reduce trust and intention.

The framework deliberately avoids treating all digital variables as independent direct predictors. For example, product-page completeness may influence intention primarily by improving perceived usefulness, which increases trust and reduces perceived risk. Similarly, an influencer's endorsement may be influential only when the creator's expertise, message style, and product fit are credible. Digital exposure without trust may increase awareness but not intention. A discount may increase immediate conversion while leaving the underlying perception of environmental value unchanged. These distinctions matter for both theory and managerial evaluation: a campaign that raises clicks is not necessarily a campaign that improves sustainable purchasing.

The model also separates intention from actual behavior. Purchase intention represents a motivational readiness to buy, not proof that the consumer bought the product or that the purchase reduced lifecycle emissions. Actual behavior may be affected by stock availability, payment failure, last-minute price changes, delivery restrictions, or competing offers. The environmental consequence further depends on what the product replaces, how long it is used, how it is delivered, and whether it is returned or discarded prematurely. Future empirical work should therefore measure intention and behavior separately and, where feasible, link survey responses to observed purchases or follow-up data.

3. METHOD

Because the present article synthesizes published evidence and does not contain a new primary dataset, the following methodology is proposed for empirical validation rather than reported as completed research. A quantitative, explanatory design would be suitable for testing the hypothesized relationships among consumer perceptions, digital information conditions, and purchase intention. The unit of analysis would be an individual who has used an e-commerce platform and encountered a product explicitly marketed as environmentally preferable within a defined recall period. To reduce ambiguity, the study should specify the product category or compare a limited set of categories with distinct sustainability attributes, such as refillable household products, recycled-material apparel, or energy-efficient consumer goods.

A multi-stage sampling strategy could recruit adult online shoppers through a combination of panel providers and platform-user communities. Eligibility criteria should require recent online shopping experience and awareness of at least one green product listing. The sampling frame should be reported transparently, including country, age distribution, income, platform usage, and category exposure. Sample-size planning should be based on power analysis and model complexity rather than a universal rule of thumb. If structural equation modeling is used, the choice between covariance-based SEM and partial least squares SEM should be justified by the research objective, measurement structure, distributional properties, and predictive emphasis. A cross-sectional survey can test associations but cannot establish strong causal claims; a time-lagged design or randomized information experiment would improve causal inference.

The questionnaire should use established multi-item measures where available and adapt them through translation, expert review, cognitive pretesting, and pilot testing. Environmental concern should measure concern about ecological consequences rather than general positivity toward sustainability. Attitude should refer to purchasing the specified green product, not environmental protection in the abstract. Perceived behavioral control should include ability to find, afford, evaluate, and obtain the product online. Green perceived value should capture environmental and functional benefits relative to sacrifices. Green trust should be measured with reference to the accuracy and reliability of environmental claims. Information usefulness should assess relevance, clarity, completeness, and decision value. Perceived greenwashing should assess exaggeration, ambiguity, selective disclosure, and doubts about substantiation. Purchase intention should be measured as a future-oriented intention to buy the product under realistic conditions.

The research design should distinguish the target of trust. At minimum, separate trust in the seller's environmental claims from trust in the platform's transaction safeguards and trust in third-party certification. These may be correlated, but they are not conceptually interchangeable. Likewise, electronic word of mouth should distinguish review credibility from review valence and volume. A high average rating does not necessarily mean that reviews provide credible environmental information. Price sensitivity can be

measured as a consumer's responsiveness to price differences, while perceived risk should distinguish performance, financial, and environmental-claim risks. Platform affordances can be measured through consumer perceptions or manipulated experimentally by displaying different product-page designs.

A rigorous analysis would begin with data screening, missing-data assessment, descriptive statistics, and tests for non-response patterns. The measurement model should be assessed for internal consistency, convergent validity, and discriminant validity. If constructs are reflective, indicators should be examined for reliability and factor loadings; if any construct is formative, its specification should be justified separately. Structural tests should estimate direct paths, indirect effects, and moderation effects using confidence intervals. Mediation analysis should examine whether information quality influences intention through green trust, while moderation analysis should test whether price sensitivity changes the association between perceived value and intention. Researchers should report effect sizes and confidence intervals, not only statistical significance.

Several threats to validity require explicit treatment. Common-method variance can be reduced through procedural separation of predictors and outcomes, clear wording, anonymity, and, where possible, temporal separation or independent behavioral measures. Social desirability may lead respondents to overstate green intentions, so survey instructions should emphasize that there are no morally correct answers. Endogeneity is possible because consumers who already intend to buy green products may seek out sustainability information and report greater trust. Instrumental-variable approaches are not automatically appropriate; they require defensible instruments. Experiments that randomize the specificity of environmental claims, third-party verification, or default delivery options can more directly test causal mechanisms. Measurement invariance should be assessed before comparing countries or demographic groups.

Ethical safeguards should include informed consent, data minimization, secure storage, and clear disclosure of whether platform behavioral data are linked to survey responses. If real transaction data are used, personally identifiable information should be removed or pseudonymized, and the research should follow relevant institutional and legal requirements. The study should avoid collecting unnecessary sensitive information and should not expose individual purchasing histories. These safeguards are particularly important when studying digital platforms because the boundary between consumer research and behavioral surveillance can become blurred.

4. RESULTS AND DISCUSSION

The literature consistently treats environmental concern as a meaningful antecedent of green consumption, yet its explanatory power depends on whether concern is converted into a product-specific evaluation. Concern can stimulate information search and create a favorable prior attitude, but consumers still face competing goals: price, convenience, performance, availability, and confidence in the claim. The practical implication is that marketers should not assume that an environmentally concerned audience will automatically accept a premium or tolerate weak product performance. A more credible strategy connects a concrete environmental attribute with a benefit the consumer can evaluate. For example, durability can be communicated through warranty length and repair support; refillability through the availability and cost of refills; recycled content through specific material disclosures. General claims such as "better for the planet" are less useful because they do not tell consumers what is improved, relative to which alternative, or under what conditions.

Table 1. Proposed constructs and operational focus

Construct	Conceptual meaning	Suggested measurement focus
Environmental concern	Concern about environmental degradation and its consequences	Concern, perceived seriousness, personal relevance
Attitude	Evaluation of purchasing the focal green product	Favorable/unfavorable evaluation, expected outcomes
Subjective norms	Perceived approval from relevant social referents	Family, peers, online communities, trusted creators
Perceived behavioral control	Perceived ability to find, afford, assess, and obtain the product	Availability, affordability, evaluation confidence, checkout ease

Construct	Conceptual meaning	Suggested measurement focus
Green perceived value	Assessment of environmental and functional benefits relative to sacrifices	Quality, durability, environmental benefit, price and effort
Green trust	Confidence that environmental claims are reliable and substantiated	Claim accuracy, seller reliability, verification
Information usefulness	Extent to which digital information improves the decision	Clarity, relevance, completeness, comparability
Electronic word of mouth	Consumer-generated information about product experience	Credibility, environmental relevance, diagnostic value
Perceived greenwashing	Perception that environmental communication is exaggerated or misleading	Vagueness, selective disclosure, unsupported claims
Price sensitivity	Degree to which price differences influence choice	Price attention, premium resistance, budget constraints
Purchase intention	Stated readiness to purchase the specified green product	Likelihood, plan, consideration under realistic conditions

Source: Authors' elaboration.

Table 2. Proposed hypotheses

Code	Proposed relationship
H1	Environmental concern is positively associated with green product purchase intention.
H2	Attitude toward green products is positively associated with purchase intention.
H3	Subjective norms are positively associated with purchase intention.
H4	Perceived behavioral control is positively associated with purchase intention.
H5	Green perceived value is positively associated with purchase intention.
H6	Green trust is positively associated with purchase intention.
H7	Green trust mediates the relationship between digital sustainability-information quality and purchase intention.
H8	Perceived usefulness of digital sustainability information is positively associated with green trust.
H9	Credible green-related electronic word of mouth is positively associated with purchase intention, partly through trust.
H10	Price sensitivity weakens the positive relationship between green perceived value and purchase intention.
H11	Perceived green risk is negatively associated with purchase intention.
H12	Perceived greenwashing is negatively associated with green trust and purchase intention.
H13	Platform credibility strengthens the positive relationship between digital sustainability-information quality and green trust.
H14	Sustainability-oriented platform affordances are positively associated with perceived behavioral control and purchase intention.
H15	The positive effect of environmental concern on intention is stronger when sustainability information is credible and easy to compare.

Source: Authors' elaboration.

Choice architecture can support lower-impact decisions, but it must preserve consumer autonomy and avoid disguising commercial objectives as environmental guidance. A platform may highlight a durable option or offer consolidated delivery by default, yet the rationale should be visible and consumers should be able to make an informed alternative choice. Ethical design differs from manipulative nudging because it makes the relevant consequence intelligible, does not exploit cognitive vulnerability, and does not misrepresent the evidence. Sustainability interventions should also be evaluated for unintended effects. For instance, a green badge may make consumers less likely to inspect product details, while a default option may increase acceptance without increasing understanding. The relevant outcome is therefore not only uptake but also informed and sustained choice.

The drivers of green purchase intention are likely to vary by category. For durable goods, repairability, energy efficiency, warranty, and long-term operating costs may dominate because consumers expect a long period of use. For apparel, material composition, production practices, durability, and the frequency of replacement are important, but style and social identity can remain powerful. For household consumables,

refill availability, packaging, price per use, and convenience may be more salient. For personal-care products, safety perceptions and ingredient transparency can be intertwined with environmental concerns. A model tested across all categories without accounting for these differences may produce averaged relationships that obscure meaningful mechanisms. Future studies should either define a focal category or model category as a theoretically relevant moderator.

Platform governance is not merely a compliance obligation; it can be a source of marketplace differentiation. A platform that consistently enforces evidence standards may reduce consumer search costs and improve confidence in sustainability-related information. Governance requires more than a verification badge: it includes rules for claim submission, audit trails, correction processes, complaint handling, and sanctions for repeated misrepresentation. Because third-party verification can be costly, platforms may consider tiered approaches that distinguish seller declarations from independently verified claims. The tiers must be clearly labeled and must not imply equivalent evidentiary strength. Governance effectiveness should be assessed through indicators such as claim-removal accuracy, repeat violations, consumer complaint resolution, and consistency of disclosure across product categories.

Recommendation systems influence the products consumers encounter and the evidence they see. If ranking algorithms optimize clicks or sales without regard to claim quality, they may amplify products with persuasive green messaging rather than verified environmental performance. Conversely, sustainability criteria embedded in discovery tools could improve access to credible alternatives, provided the criteria are transparent and do not become pay-to-play signals. Researchers should examine whether consumers interpret ranked products as endorsed by the platform and whether that interpretation increases trust beyond what the underlying evidence warrants. Platform design should make clear when visibility reflects paid promotion, popularity, relevance, or verified environmental attributes. Otherwise, algorithmic presentation can create an implicit endorsement that consumers cannot easily evaluate.

Lifecycle-oriented marketing would shift attention from isolated claims to the product's use pathway. Digital pages can communicate expected durability, repair options, refill compatibility, end-of-life instructions, and delivery choices alongside material or emissions information. Such information can help consumers understand how their own use influences environmental outcomes. However, lifecycle claims should be proportionate to available evidence and should not overload consumers with unsupported numerical precision. A practical principle is to provide a clear summary, a transparent basis, and access to further detail. Where life-cycle assessment is used, the functional unit, system boundary, assumptions, and comparator should be disclosed in a way that is accessible to non-specialists.

The framework also suggests that the sequence of consumer judgments may be more informative than a list of direct effects. A consumer first notices a product or claim, then decides whether the information is relevant, then evaluates credibility, and finally weighs value against sacrifice. These stages are not necessarily linear: a low price may attract attention before the consumer examines environmental evidence, while a suspicious claim may terminate evaluation immediately. Future work can use process measures, clickstream data, eye-tracking, or experimental manipulations to determine which information is noticed and when trust is formed. Such designs can help explain why the same disclosure may influence some consumers but remain invisible to others.

Another important distinction concerns the source of environmental information. Seller-generated information is often comprehensive but may be viewed as self-interested. Independent certification can reduce perceived conflict of interest, although consumers may not recognize the certifier or understand the standard. Consumer reviews provide experiential detail but are vulnerable to selection and manipulation. Public databases may provide authoritative information but can be difficult to interpret. A well-designed platform can combine these sources while preserving their provenance. Rather than collapsing every source into a single score, it can identify whether information originates from the seller, a third party, a customer, or an official record. This source transparency can help consumers calibrate trust instead of relying on the platform's visual presentation alone.

The environmental meaning of "green" also requires discipline. A product can be less harmful than a comparator without being environmentally benign. Some claims apply to packaging, others to manufacturing energy, recycled content, water use, or carbon emissions. Consumers may interpret a narrow claim as a

statement about the whole product unless the boundary is explicit. This is one reason that broad green imagery can be misleading even when a narrow technical claim is accurate. Marketing communication should therefore state the attribute and scope, and should avoid implying a comprehensive environmental advantage from a single improvement. The framework's emphasis on trust and perceived greenwashing is intended to capture the consumer response to this ambiguity.

The distinction between low-carbon behavior and green purchasing should also be preserved in measurement. A consumer may buy a green product but use it briefly, replace it frequently, or choose emissions-intensive delivery. Another consumer may purchase a conventional product less frequently and extend its useful life. Neither behavior can be evaluated accurately through purchase intention alone. Future studies can develop multidimensional outcomes that include product substitution, frequency of purchase, durability, repair, reuse, delivery choice, and return behavior. Although such measurement is more demanding, it better aligns consumer research with the environmental outcomes that motivate the field.

From a customer-journey perspective, the influence of sustainability information can differ across discovery, evaluation, checkout, delivery, and post-purchase use. At discovery, search filters and recommendation systems determine whether a green alternative enters the consumer's consideration set. During evaluation, product-page disclosures and reviews influence perceived value and trust. At checkout, price, delivery speed, and convenience may override earlier intentions. After delivery, product performance, packaging, and customer service determine whether expectations are confirmed. A model that measures only the product-page stage may therefore miss the point at which intention is abandoned. Future studies should map the journey and identify the stage where consumers encounter the most consequential barrier.

Post-purchase experience is especially important for repeat green purchasing. Consumers may initially buy a product because of environmental concern, but repeat behavior depends on whether the product performs as expected and whether the claim remains credible after use. A product that is difficult to refill, repair, or dispose of responsibly can create disconfirmation. Conversely, convenient repair services, reliable replacement parts, and clear take-back options can reinforce the perceived value of the purchase. This suggests that retention strategies in sustainable commerce should focus on enabling product longevity rather than simply offering incentives for frequent repurchase.

The platform's role in return behavior also deserves attention. Easy returns can reduce perceived purchase risk and increase initial intention, but high return rates may generate additional transport, repackaging, and product loss. Accurate images, detailed specifications, sizing guidance, and clear environmental disclosures can reduce avoidable returns while protecting consumer rights. Sustainability communication should not discourage legitimate returns or shift the environmental burden onto consumers when products are defective or misrepresented. Instead, platform design should reduce preventable mismatch and improve product quality information before purchase.

The framework implies a distinction between trust calibration and trust maximization. The objective should not be to make consumers trust every green claim more strongly; it should be to help consumers place an appropriate level of confidence in the evidence available. Overconfidence in weak claims can increase greenwashing vulnerability, whereas generalized distrust can discourage purchases of genuinely beneficial products. Transparent disclosure of uncertainty, certification scope, and limitations can support calibrated trust. In practical terms, this means that platforms should reward evidence quality rather than the mere presence of sustainability language.

Finally, low-carbon consumer behavior should be treated as a shared responsibility across consumers, firms, platforms, and institutions. Consumers make choices, but those choices are shaped by the options available, the credibility of product information, price structures, and delivery infrastructure. A strategy that places the entire burden on individual morality risks overlooking these structural conditions. The most effective interventions are likely to combine individual motivation with better market information, affordable alternatives, operational integrity, and policy frameworks that discourage misleading claims. This systems perspective is consistent with the article's central argument that digital tools can enable more sustainable decisions only when their informational and commercial incentives are aligned with credible environmental outcomes.

From a customer-journey perspective, the influence of sustainability information can differ across discovery, evaluation, checkout, delivery, and post-purchase use. At discovery, search filters and recommendation systems determine whether a green alternative enters the consumer's consideration set. During evaluation, product-page disclosures and reviews influence perceived value and trust. At checkout, price, delivery speed, and convenience may override earlier intentions. After delivery, product performance, packaging, and customer service determine whether expectations are confirmed. A model that measures only the product-page stage may therefore miss the point at which intention is abandoned. Future studies should map the journey and identify the stage where consumers encounter the most consequential barrier.

Post-purchase experience is especially important for repeat green purchasing. Consumers may initially buy a product because of environmental concern, but repeat behavior depends on whether the product performs as expected and whether the claim remains credible after use. A product that is difficult to refill, repair, or dispose of responsibly can create disconfirmation. Conversely, convenient repair services, reliable replacement parts, and clear take-back options can reinforce the perceived value of the purchase. This suggests that retention strategies in sustainable commerce should focus on enabling product longevity rather than simply offering incentives for frequent repurchase.

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Environmental concern can also have an unintended effect when consumers become more knowledgeable about the complexity of environmental impacts. Greater concern may make consumers more skeptical of simplistic claims, particularly where the product's lifecycle is opaque. This is not necessarily a failure of green marketing. Skepticism can be a rational response to an information environment in which sustainability language is frequently used without consistent evidence. In that situation, the appropriate response is better substantiation rather than more emotionally forceful persuasion. Marketers should recognize that an informed consumer may require stronger proof, not simply stronger messaging.

The analysis suggests that perceived value is a central bridge between environmental motivation and purchase intention. Consumers evaluate green products as products first and environmental interventions second. A reusable item that breaks quickly may produce disappointment and waste; a "natural" product that does not perform as expected can undermine trust in the category; a repairable device that lacks spare parts may not deliver its promised lifecycle advantage. Green value therefore requires functional credibility and a plausible environmental benefit. Product innovation, quality assurance, repair infrastructure, refill systems,

and after-sales service are part of the marketing proposition because they make the environmental claim materially meaningful.

The price dimension deserves more than the assumption that consumers are either willing or unwilling to pay a green premium. Price acceptance depends on income, perceived durability, product category, trust, and the visibility of savings over time. A higher upfront price may be rational for an efficient appliance if operating costs are lower, but the same logic is less persuasive for a low-cost consumable. E-commerce pages can support more informed decisions by displaying lifecycle-relevant attributes and total cost of ownership where credible data are available. They should not, however, present speculative carbon savings as precise facts. Where evidence is uncertain, uncertainty should be communicated rather than concealed.

Trust is especially important online because the consumer cannot directly observe many production and sourcing practices. Yet trust should not be treated as a generic brand sentiment. Consumers may trust a platform's payment system but doubt the seller's environmental claims; they may trust an independent certification but be uncertain about product durability. The most effective information architecture therefore makes the source of each claim explicit. A certification should link to its criteria and issuer; a recycled-content claim should state the percentage and material scope; a carbon statement should explain the boundary and method used. Where verification is available, a link to the underlying evidence can reduce dependence on vague brand reputation.

Trust also develops over time through consistency between claims and experience. If a product arrives with excessive packaging despite being marketed as sustainable, the consumer may infer that the firm's environmental positioning is superficial. If the product is durable and the seller offers repair or refill support, the experience may reinforce trust. This implies that green trust is not created solely by communications departments. It depends on operations, sourcing, fulfillment, customer service, and complaint handling. A mismatch between environmental promise and operational delivery can erase the benefits of sophisticated digital storytelling.

E-commerce platforms often assume that adding more product information improves decision quality. The synthesis suggests a more conditional relationship. Information is useful when it answers a decision-relevant question, is comparable across alternatives, and is understandable to the target consumer. Long descriptions full of technical terminology may increase cognitive burden without improving comprehension. Conversely, a short summary supported by expandable evidence can make complex claims accessible without removing detail. A practical design could separate a concise environmental summary from technical disclosures, certification criteria, lifecycle assumptions, and sourcing information. This layered approach accommodates different levels of consumer involvement while preserving transparency.

Information usefulness is also a matter of comparability. If one seller reports recycled content by weight and another reports it by component, consumers cannot easily compare the products. If one product uses "carbon neutral" without explaining offsets while another reports estimated emissions across a defined boundary, the labels may create false equivalence. Platforms can improve decision quality by standardizing disclosure fields and explaining when metrics are not directly comparable. Standardization should not be mistaken for proof: a standardized field can still contain unverified data. The strongest design combines comparable presentation with verification and accountability.

Reviews and social content can provide information that formal product descriptions omit, particularly about real-world performance, packaging, durability, and customer service. However, review systems are not neutral evidence. Consumers may post reviews because of unusually positive or negative experiences, incentives can distort ratings, and reviewers may not have the knowledge needed to evaluate environmental performance. A review saying that a product "feels eco-friendly" is different from evidence that its materials are certified or that it lasts longer than a conventional alternative. Platforms should distinguish experiential feedback from substantiated environmental claims and should disclose incentivized endorsements clearly.

Influencers can make sustainability more relatable, but credibility depends on expertise, consistency, and fit between the creator and the claim. A creator who communicates practical product knowledge may be more persuasive for technical claims than one whose influence rests primarily on entertainment, while entertainment-oriented creators may still be effective when the endorsement style suits the message. The

key managerial lesson is not that one influencer category is universally superior; it is that endorsement strategy should align with the kind of evidence the consumer needs. The platform should also avoid presenting sponsored content as independent validation.

Greenwashing can damage purchase intention through two routes. First, it reduces confidence in the specific product's environmental benefits. Second, it can produce broader skepticism toward green claims, brands, or platform categories. This spillover is especially costly because consumers may lack the time or ability to investigate each claim individually. When the marketplace becomes saturated with vague green language, even credible firms may struggle to communicate their differences. Responsible marketers should therefore treat substantiation as a strategic asset. Specific claims should have a documented basis, scope, and date; comparative claims should identify the comparator; and claims about offsets should be separated from claims about direct emissions reductions.

A further concern is the asymmetry between the ease of making a claim and the difficulty of disproving it. A seller can add a leaf icon or a sustainability badge in seconds, while the consumer may need extensive research to determine whether the claim is meaningful. This imbalance creates a case for platform governance and public policy. Marketplaces can require evidence for defined categories of environmental claims, offer reporting mechanisms for misleading listings, and apply consistent sanctions. Regulators can clarify the standards for environmental claims and improve the availability of independent verification. The objective is not to eliminate marketing creativity but to prevent creative presentation from substituting for evidence.

Digital retail can make greener products more discoverable and accessible, yet convenience can also increase consumption volume. One-click purchasing, personalized recommendations, limited-time offers, and frictionless returns may encourage unnecessary buying. A platform may improve the conversion rate for green-labelled goods while still increasing total material throughput. Consequently, the low-carbon value of e-commerce cannot be assessed solely by the share of green products sold. Researchers and managers should consider product longevity, replacement behavior, packaging, delivery consolidation, return rates, and the possibility that a purchase displaces a more sustainable option or adds to consumption without substitution.

This creates a distinction between "greener purchasing" and "lower-carbon consumption." The first describes a relative choice among products; the second asks whether the overall consumption pattern has lower environmental impact. A consumer buying a recycled-material shirt instead of a conventional shirt may make a relative improvement, but buying five additional shirts because they are promoted as sustainable may undermine the benefit. Marketing should therefore avoid implying that every green purchase is automatically environmentally beneficial. Messaging that supports durability, repair, reuse, refill, and mindful replacement can align commercial activity more closely with consumption outcomes. This may require firms to shift from maximizing transaction frequency toward customer lifetime value based on service, maintenance, and durable relationships.

The framework predicts variation across consumers and product categories. Income and price sensitivity influence the weight given to monetary sacrifice. Product involvement affects how much information consumers seek. Prior experience may increase confidence, but it can also create skepticism if earlier green purchases disappointed. Digital literacy shapes the ability to evaluate claims and recognize sponsored content. Cultural and institutional contexts influence the meaning of social norms, trust in certification, and expectations of corporate responsibility. The same platform feature may therefore help one group and confuse another. Segmentation should be based on observed needs and decision barriers rather than simplistic assumptions that younger consumers are inherently sustainable or that environmentally concerned consumers always behave consistently.

The most useful segmentation may distinguish consumers by the barrier that prevents action. Some consumers need functional reassurance; others need credible evidence; others face price constraints or lack product availability. For the first group, demonstrations, warranties, and user reviews may be effective. For the second, traceability and certification details may matter more. For price-constrained shoppers, accessible entry-level products, refill savings, or transparent total-cost comparisons may help. For consumers who struggle to locate credible alternatives, platform filters and standardized labels can reduce search costs. This

barrier-based approach avoids treating sustainability marketing as a single message that can be applied to all audiences.

The literature on green consumption repeatedly raises the problem that stated intentions do not always become actual behavior. In online settings, this gap may arise between product-page interest and checkout, between intention and a later competing offer, or between purchase and subsequent use. Self-report measures can also overstate sustainable behavior because respondents wish to present themselves favorably. Research should therefore avoid claiming that purchase intention directly demonstrates emissions reductions. Stronger designs combine surveys with clickstream or transaction data where consent and privacy safeguards permit, follow up after purchase, and measure product use or disposal when relevant. Experiments can test whether a credible disclosure changes choice under controlled conditions, while field studies can assess whether the effect persists in real marketplaces.

Even observed purchases do not establish environmental benefit without a counterfactual. A green product may replace a higher-impact alternative, or it may be an additional purchase. A lower-impact delivery option may reduce emissions per parcel but increase total orders. A product made with recycled content may have advantages in material use while creating trade-offs in durability or recyclability. Life-cycle assessment and consumer-behavior research should therefore be linked carefully. The marketing question is not simply whether a green product sells, but whether the choice plausibly improves environmental outcomes relative to the alternative and use pattern.

5. IMPLICATIONS

For e-commerce platforms, sustainability should be embedded in the information architecture rather than confined to seasonal campaigns. Product pages can provide standardized fields for material composition, durability, repairability, refill options, packaging, and credible certifications. Filters should use clearly defined criteria, and sponsored placements should be disclosed. Platforms should avoid displaying an undifferentiated “eco” badge when products meet different standards. If a platform cannot verify a claim, it should not present the claim as independently validated. Where technically and commercially feasible, product information can link to certification records or supplier documentation (European Commission, 2023; Quaser, 2026).

For marketers and brand managers, the central task is to align environmental communication with the product’s actual value proposition. Claims should be specific, bounded, and supported. A company should explain what is improved, how the claim was assessed, and what remains outside the claim’s scope. The message should also connect environmental attributes with consumer-relevant benefits such as durability, repair, safety, convenience, or long-term cost. This does not mean disguising sustainability as self-interest; it means recognizing that consumers evaluate products through multiple criteria. A credible green proposition integrates environmental performance with reliable functional performance (Fang, 2024; Saiyed & Nurmalasari, 2026).

For product and operations teams, the findings imply that sustainable marketing cannot be separated from delivery and after-sales systems. Excessive packaging, avoidable returns, premature product failure, and unavailable replacement parts can undermine a product’s environmental promise. Retailers should consider packaging design, consolidated delivery options, accurate product descriptions, sizing guidance, repair services, and reverse logistics. They should also monitor complaints about sustainability claims and treat them as signals of possible operational inconsistency. If product performance falls short, changing the advertising language is not an adequate remedy.

For public policymakers, the priority is to reduce the information asymmetry that allows vague or misleading environmental claims to flourish. Clear claim standards, enforcement, independent certification, and consumer education can make market signals more reliable. Policy should also recognize that consumers cannot be expected to conduct a lifecycle analysis for every purchase. Standardized disclosures and trusted verification mechanisms reduce individual information costs. At the same time, rules should be designed to avoid imposing disproportionate burdens on small firms while maintaining meaningful evidence requirements. Support for small and medium-sized enterprises may include accessible guidance, common

reporting templates, and lower-cost certification pathways (European Commission, 2023; Supranta & Permatasari, 2025).

For researchers, the agenda should move beyond adding new predictors to increasingly complex intention models. Greater progress may come from testing mechanisms, boundary conditions, and actual outcomes. Researchers should distinguish the effects of platform trust from green-claim trust, test information interventions experimentally, examine whether defaults affect choice without reducing autonomy, and compare intention with observed behavior. Longitudinal studies can examine whether trust persists after product experience. Cross-country studies should test measurement invariance before interpreting differences as cultural effects. Researchers should also investigate whether sustainability labels influence product choice, total spending, return behavior, and repeat purchasing in ways that improve or worsen lifecycle outcomes.

6. CONCLUSION

This article examined the determinants of green product purchase intention in e-commerce by integrating behavioral theory, perceived value, trust, digital information, and platform design. The central conclusion is that environmental concern creates a motivational foundation but does not by itself ensure purchase intention. Consumers also need to perceive meaningful functional and environmental value, believe that the claim is credible, and feel able to complete the purchase under realistic financial and practical conditions. Digital platforms can support these judgments through useful information, credible reviews, comparable disclosures, verification, and carefully designed choice architecture. The same platforms can undermine them through vague labels, greenwashing, information overload, and consumption-oriented interface features (Zhuang et al., 2021; Nekmahmud et al., 2022; Wu & Long, 2024).

This article has several limitations. It is an integrative synthesis rather than a preregistered systematic review or meta-analysis, so it does not claim exhaustive coverage or calculate pooled effect sizes. The included literature varies in methods, settings, constructs, and product categories. The conceptual framework is designed to integrate established relationships and digital-specific mechanisms, but it remains to be tested empirically as a complete model. The article also focuses on purchase intention, while the ultimate environmental significance of consumption depends on actual behavior and product lifecycle conditions.

Future work should test the model in specific product categories and marketplaces, using transparent sampling and validated measures. A useful design would compare product pages with general environmental claims, specific evidence, and independently verified disclosures, while measuring trust, perceived value, and actual choice. Another study could test whether delivery consolidation defaults influence consumer selection and whether the effect varies with perceived convenience. A third direction is to examine the role of AI-generated product summaries and recommender systems: they may reduce search effort, but they may also reproduce inaccurate claims or hide uncertainty. Researchers should evaluate whether AI summaries preserve the scope and limitations of environmental evidence (Sharma et al., 2023; Yusoff et al., 2023).

Additional research should investigate distributional and ethical questions. Sustainability features may benefit consumers with higher digital literacy while excluding those who cannot interpret technical disclosures. Green premiums may create a two-tier market in which environmentally preferable options are accessible mainly to affluent consumers. Platform algorithms may privilege brands able to pay for visibility, including those with stronger marketing budgets but not necessarily stronger environmental performance. Studies should therefore examine how affordability, accessibility, and platform governance shape who can participate in lower-carbon consumption. The objective should be a more credible and inclusive marketplace, not merely higher conversion rates for green-labelled products.

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