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Beyond Environmental Transparency: Brand Credibility as a Key Driver of Willingness to Pay for Low Global Warming Potential Construction Materials

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ABSTRACT

The construction sector accounts for a substantial share of global energy consumption and greenhouse gas emissions, with embodied carbon from building materials increasingly recognized as a critical contributor. In response, Life Cycle Assessment (LCA) and Environmental Product Declarations (EPDs) have been promoted to enhance environmental transparency and support environmentally informed material selection. However, empirical evidence remains inconclusive as to whether standardized environmental information alone is sufficient to influence professionals' willingness to pay (WTP).

This study investigates how environmental attitude, environmental knowledge, and perceived brand credibility jointly shape construction professionals' willingness to pay a price premium for green certified, low Global Warming Potential (low GWP) wall materials when standardized EPD based environmental information is provided. A quantitative cross sectional survey was conducted among 136 construction professionals. Simplified LCA results were used to develop uniform EPD style environmental profiles presented consistently across material alternatives. Data were analyzed using Spearman's rank correlation and multiple linear regression.

The results show that environmental attitude and environmental knowledge are positively associated with willingness to pay at the bivariate level. However, in the multivariate regression model, only perceived brand credibility remains a statistically significant predictor of WTP ($\beta = 0.497$, $p < 0.001$), while the effects of environmental attitude ($\beta = 0.155$, $p = 0.184$) and environmental knowledge ($\beta = -0.042$, $p = 0.655$) are non significant. The model explains approximately 36% of the variance in willingness to pay ($R^2 = 0.359$).

These findings indicate that even under standardized and transparent environmental information, professionals' economic decisions are primarily shaped by credibility based considerations. EPDs function as necessary informational background conditions, whereas brand credibility—closely linked to trust, risk management, and professional accountability—emerges as the dominant driver of willingness to pay for low GWP construction materials.

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INTRODUCTION

The building and construction sector is a major contributor to global anthropogenic greenhouse gas (GHG) emissions, accounting for around 37% of energy- and process-related CO_2 emissions worldwide (UNEP, 2020; IPCC, 2022). Although improving operational energy efficiency has traditionally been a central focus, increasing attention has shifted toward the embodied carbon of construction materials—namely, emissions associated with material extraction, manufacturing, transportation, and end-of-life stages. Addressing embodied carbon

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is now widely recognized as a key lever for achieving deep decarbonization in the built environment (Pomponi & Moncaster, 2017; Giesekam et al., 2016).

In this context, Life Cycle Assessment (LCA) has been institutionalized as the primary methodological framework for quantifying environmental impacts, while Environmental Product Declarations (EPDs) have emerged as standardized, third-party-verified tools for communicating environmental performance and enhancing market transparency (ISO 14025, 2006; Del Borghi, 2013).

Despite their methodological rigor and growing uptake, the extent to which EPDs effectively drive market shifts toward low-carbon materials remains empirically uncertain. One major challenge is the well-established attitude–behavior gap, whereby pro-environmental attitudes and knowledge do not consistently translate into concrete economic actions, such as a willingness to pay (WTP) a price premium (Kollmuss & Agyeman, 2002; Vermeir & Verbeke, 2006; White et al., 2019). In professional construction procurement, decisions are strongly shaped by cost constraints, technical performance requirements, regulatory compliance, and project-related risks, often placing environmental attributes in a secondary position (Giesekam et al., 2016; Rex & Baumann, 2007). In addition, the practical use of EPDs is frequently limited by inconsistencies in system boundaries, data quality, and reporting scope—most notably the predominant focus on the A1–A3 product stage—which restrict comparability and complicate interpretation for time-constrained professionals (Buyle et al., 2013; Hoxha et al., 2020; Palumbo et al., 2020).

This disconnect between information provision and economic decision-making suggests that environmental transparency, while necessary, may not be sufficient on its own. Research in marketing and behavioral economics emphasizes the critical role of trust and credibility in high-risk, information-asymmetric markets (Erdem & Swait, 2004; Spence, 1973). In the context of green products, where environmental claims are often complex and costly for buyers to verify, brand credibility—defined as the perceived trustworthiness and expertise of a brand—functions as an important heuristic. It reduces perceived risk, increases confidence in environmental claims, and can legitimize price premiums for clients and stakeholders (Delgado-Ballester & Munuera-Alemán, 2005; Parguel et al., 2011; Wang et al., 2020). As a result, even when standardized EPD information is available, its influence may depend on the credibility of the information source.

Accordingly, this study argues that understanding the market uptake of low-Global Warming Potential (low-GWP) construction materials requires an integrated analytical approach that goes beyond a sole focus on environmental psychology (attitude and knowledge) or information-based instruments such as EPDs. Instead, it is necessary to examine how these factors interact with market-based signals of brand credibility within the specific context of professional procurement. While environmental attitude and knowledge may establish an underlying openness to sustainability (Ajzen, 1991; Thøgersen et al., 2010), professionally salient considerations—such as risk management, accountability, and supply reliability—proxied here by brand credibility, are likely to play a more decisive role in actual WTP decisions (Laroche et al., 2001; Testa et al., 2018).

Nevertheless, empirical studies that simultaneously integrate environmental psychology and marketing/signaling theory within a single professional decision-making framework remain limited. Most existing research examines these drivers separately (e.g., Barber et al., 2009 for knowledge; Akturan, 2018 for credibility), leaving an important gap in understanding their relative and combined effects when standardized environmental information is held constant.

To date, no empirical study has simultaneously examined environmental attitude, environmental knowledge, and brand credibility within a single analytical framework while holding environmental information quality constant through standardized EPDs. Prior research typically treats these constructs in isolation—environmental psychology focuses on attitude

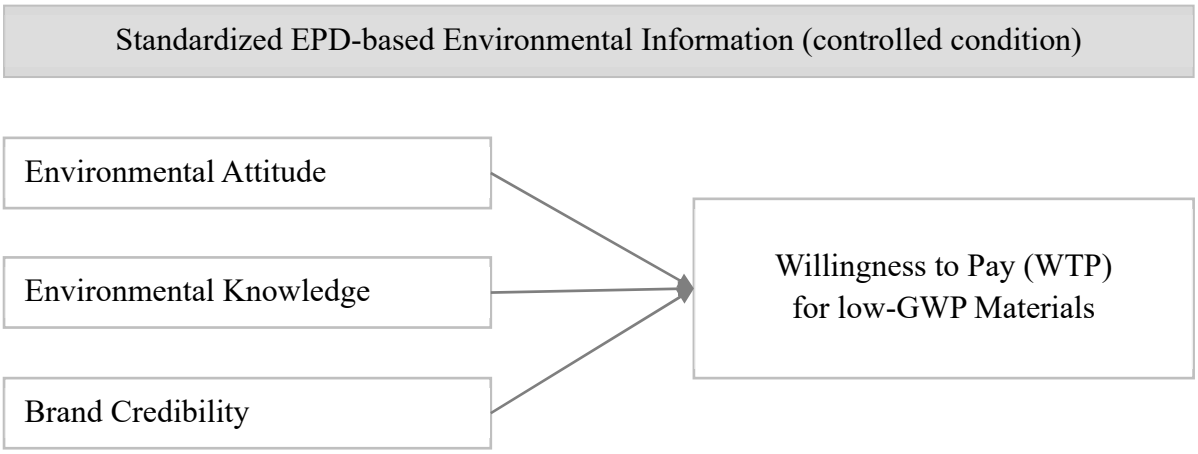

Fig. 1. Conceptual framework illustrating the hypothesized relationships between environmental attitude, environmental knowledge, and perceived brand credibility and construction professionals' willingness to pay (WTP) for lowGWP materials. Standardized EPDbased environmental information is provided to all respondents and held constant across alternatives.

and knowledge, whereas signaling-theory studies examine credibility mainly under conditions of information asymmetry. By providing all respondents with simplified yet fully comparable LCA-based EPD profiles, the present study isolates the unique and joint effects of these drivers in a professional procurement setting where informational ambiguity is minimized. This controlled and integrated design enables a rigorous test of signaling theory in B2B construction markets and clarifies whether credibility remains the dominant heuristic in economic decision-making even when environmental transparency is maximized.

To address this gap, the present study examines the following research question: under conditions of standardized EPD-based environmental transparency, what are the relative effects of environmental attitude, environmental knowledge, and perceived brand credibility on construction professionals' willingness to pay for low-GWP wall materials? By integrating these constructs within a unified analytical model, the study seeks to provide a more refined explanation of sustainable procurement behavior through the testing of three hypotheses.

• **H1:** Environmental attitude is positively associated with professionals' WTP for green-certified, low-GWP wall materials.

• **H2:** Environmental knowledge is positively associated with professionals' WTP for green-certified, low-GWP wall materials.

• **H3:** Perceived brand credibility is positively associated with professionals' WTP for green-certified, low-GWP wall materials

The primary aim of this study is to empirically test the relative strength of environmental attitude, knowledge, and brand credibility in predicting construction professionals' WTP for low-GWP materials when EPD information is provided, thereby clarifying the drivers of sustainable procurement beyond environmental transparency alone.

Figure 1 presents the conceptual framework of the study and summarizes the hypothesized relationships among the key constructs.

MATERIALS & METHODS

This study adopted a quantitative, cross-sectional survey design to investigate the determinants of construction professionals' willingness to pay (WTP) a price premium for green-certified, low-Global Warming Potential (low-GWP) wall materials. The research framework combined

constructs drawn from environmental psychology (environmental attitude and environmental knowledge) and marketing research (brand credibility) within a single analytical model, applied to a professional procurement context in which standardized environmental information was provided through Environmental Product Declarations (EPDs). The primary objective was to isolate the relative influence of behavioral and reputational factors on economic decision-making under conditions of reduced information asymmetry.

A total of 136 valid questionnaires were collected from construction professionals based in Tehran, including architects, civil engineers, general contractors, and energy and environmental consultants who were actively involved in material selection processes. Overall, respondents demonstrated moderate to high levels of professional experience, with a mean work-experience score of 3.23 (SD = 0.99) on a four-point ordinal scale, as reported in Table 1. The distribution of respondents by primary professional field is presented in Table 2, while educational attainment levels are summarized in Table 3. The final dataset consisted of 136 valid responses from construction professionals. This sample size satisfies commonly recommended thresholds for multivariate statistical analysis. According to Bentler and Chou (1987), a minimum ratio of approximately ten observations per estimated parameter is generally considered adequate for structural or multivariate models. In addition, power analysis guidelines suggest that for a medium effect size with a significance level of $\alpha = 0.05$ and statistical power of 0.80, a minimum sample between approximately 90 and 120 observations is sufficient for models of this complexity. Therefore, the sample size of 136 respondents exceeds these minimum recommendations and is considered adequate for the statistical analyses conducted in this study.

Data were collected using a structured questionnaire consisting of closed-ended items measured on five-point Likert scales (1 = strongly disagree; 5 = strongly agree). The key constructs assessed included environmental attitude (reflecting pro-environmental orientation toward low-GWP materials), environmental knowledge (self-reported awareness of environmental performance differences among wall materials), brand credibility (the perception that the use of certified low-GWP materials enhances professional or organizational reputation), and willingness to pay, defined as respondents' stated willingness to pay up to a 15% price premium for green-certified,

Table 1. Distribution of respondents' work experience

Work Experience	Frequency	Percent
Less than 5 years	7	5.1
5–10 years	33	24.3
11–15 years	18	13.2
More than 15 years	78	57.4
Total	136	100.0

Table 2. Primary field of activity of respondents

Primary Field	Frequency	Percent
Energy & Environmental Consultant	14	10.3
Architect	57	41.9
Civil Engineer	46	33.8
General Contractor	19	14.0
Total	136	100.0

Table 3. Highest level of education of respondents

Level of Education	Frequency	Percent
Bachelor's Degree	65	47.8
Master's Degree	48	35.3
PhD / Doctorate	23	16.9
Total	136	100.0

low-GWP wall materials. This study focused on willingness to pay (WTP) because the primary objective was to quantify respondents' monetary valuation of low-carbon building materials within a purchase-oriented decision context. Willingness to accept (WTA) was not incorporated into the survey instrument, as the study design centered on eliciting price-premium acceptance rather than compensation requirements. Although WTA measures may offer additional insight into valuation asymmetries, the present framework intentionally employed WTP to align with market-adoption dynamics and policy-relevant pricing considerations.

All constructs in this study were measured using multi-item scales adapted from established literature. Respondents evaluated each statement using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate stronger agreement with the construct.

Environmental Knowledge

Environmental knowledge reflects respondents' awareness and understanding of environmental issues related to construction materials and climate change. This construct was measured using four items adapted from prior environmental knowledge studies. Sample items include:

• "Climate change is mainly caused by human and industrial activities."

• "Global Warming Potential (GWP) is an important indicator for assessing the environmental impact of building materials."

• "I am aware that different construction materials (e.g., brick, concrete block, gypsum panels) have different environmental impacts."

• "I have access to reliable information about the GWP of construction materials."

Environmental Attitude

Environmental attitude reflects respondents' proactive orientation toward reducing environmental impacts in construction practices. The construct was measured using three items capturing behavioral intentions and environmental consideration in professional decision-making. Sample items include:

• "I actively try to reduce carbon emissions in my current construction projects."

• "Reducing the environmental impact of building materials is an important consideration in my project decisions."

• "I prefer construction materials with lower environmental impact even when they require additional effort or cost."

Brand Credibility

Brand Credibility refers to the perceived professional and reputational benefits associated with the use of environmentally friendly construction materials. This construct was measured using three items reflecting perceived credibility, brand value, and trust in environmental certification. Sample items include:

• "Using low-GWP materials increases my professional credibility."

• "Using environmentally friendly construction materials enhances my personal or organizational brand value."

• "I trust the transparency and reliability of environmental certifications for construction materials."

The internal consistency of the measurement instrument was acceptable, with an overall Cronbach's alpha of $\alpha = 0.709$.

Several procedural and statistical measures were implemented to minimize potential respondent bias. First, the questionnaire was administered anonymously and no personally identifiable information was collected, reducing the likelihood of social desirability bias.

Respondents were also informed that there were no correct or expected answers and that responses would be used solely for academic research purposes.

In addition, questionnaire items were arranged in different sections to reduce response pattern effects. To assess the potential presence of common method bias, Harman's single-factor test was conducted. The results indicated that no single factor accounted for the majority of the variance, suggesting that common method bias was not a significant concern. Variance inflation factor (VIF) values were also examined and remained below recommended thresholds, further confirming the absence of substantial common method bias.

To ensure that material evaluations were based on consistent and credible environmental information, simplified Life Cycle Assessment (LCA) results were used to develop EPD-style profiles for commonly used wall materials. The LCA employed a cradle-to-gate plus end-of-life system boundary and a functional unit of 1 m^2 of wall construction, allowing direct comparison across alternatives. These EPD summaries were embedded within the questionnaire and served as an informational control mechanism to reduce information asymmetry and focus the analysis on behavioral determinants. All responses were screened for completeness, and missing data were handled using listwise deletion.

For statistical analysis, multiple linear regression was applied to examine the simultaneous effects of environmental attitude, environmental knowledge, and perceived brand credibility on willingness to pay, consistent with standard practice in applied behavioral research. Although Shapiro–Wilk tests indicated deviations from normality in several observed variables, it is well established that the assumptions of linear regression relate to the distribution of model residuals rather than the marginal distributions of the raw variables. Therefore, additional regression diagnostics were conducted. Residual analyses, including Q–Q plots, standardized residual histograms, and residual-versus-fitted plots, did not reveal substantial violations of normality, homoscedasticity, or linearity. To further evaluate the robustness of the model, the regression was also estimated using heteroskedasticity-consistent (Huber–White) robust standard errors. The results remained consistent in terms of coefficient direction, magnitude, and statistical significance, indicating that the findings were not materially affected by the observed non-normality in the raw variables. Bivariate relationships were initially assessed using Spearman's rank-order correlation (ρ). Regression diagnostics confirmed the adequacy of the model, with Variance Inflation Factor (VIF) values below 3.3, indicating no problematic multicollinearity, and a Durbin–Watson statistic of 1.878, suggesting independence of residuals. All statistical analyses were conducted using IBM SPSS Statistics (Version 29) at a significance level of $p < 0.05$. Ethical standards were observed throughout the study, with informed consent obtained from all participants and responses collected anonymously.

RESULTS AND DISCUSSION

Descriptive statistics were calculated for environmental attitude, environmental knowledge, brand credibility, and willingness to pay (WTP) for green-certified, low-GWP wall materials, all measured on five-point Likert scales (1 = strongly disagree, 5 = strongly agree; Likert, 1932). As presented in Table 4, respondents reported relatively positive environmental attitudes ($M = 3.72$, $SD = 0.61$) and moderate environmental knowledge ($M = 3.68$, $SD = 0.57$). Perceived brand credibility showed the highest mean score ($M = 3.94$, $SD = 0.62$). WTP was moderate ($M = 3.45$, $SD = 0.73$), indicating openness to paying a price premium alongside remaining cost-related considerations in professional procurement.

Spearman's rank-order correlations were conducted to examine bivariate relationships among the study variables (Hauke & Kossowski, 2011). As shown in Table 5, all correlations were positive and statistically significant ($p < 0.001$). Environmental attitude was moderately correlated with WTP ($\rho = 0.361$) and strongly correlated with environmental knowledge (ρ

Table 4. Descriptive statistics of study variables

Variable	Mean	SD	Scale Range
Environmental Attitude (Attitude_GWP_Index)	3.72	0.61	1–5
Environmental Knowledge (Env_Knowledge_Materials)	3.68	0.57	1–5
Brand Credibility (LowGWP_Brand_Value)	3.94	0.62	1–5
Willingness to Pay (Green_Certified_Price_Premium)	3.45	0.73	1–5

Table 5. Spearman's rankorder correlations (N = 136)

Variables	Environmental Attitude	Environmental Knowledge	Brand Credibility	Willingness to Pay
Environmental Attitude	1			
Environmental Knowledge	0.563***	1		
Brand Credibility	0.696***	0.533***	1	
Willingness to Pay	0.361***	0.388***	0.562***	1

Note: Spearman's rho coefficients reported; *** $p < 0.001$.

Table 6. Multiple regression results

Predictor	B	SE	β	t	p	VIF
Constant	0.425	0.410	-	1.035	0.302	-
Environmental Attitude	0.233	0.175	0.155	1.337	0.184	2.770
Environmental Knowledge	–0.035	0.077	−0.042	−0.448	0.655	1.843
Brand Credibility	0.548	0.139	0.497	3.942	<0.001	3.269

= 0.563). Environmental knowledge was also positively associated with WTP (ρ = 0.388). Perceived brand credibility exhibited the strongest correlation with WTP (ρ = 0.562) and was strongly related to both environmental attitude (ρ = 0.696) and environmental knowledge (ρ = 0.533). These findings provide preliminary support for the hypothesized positive relationships among the variables.

Multiple linear regression was employed to assess the simultaneous effects of environmental attitude, environmental knowledge, and perceived brand credibility on WTP (Field, 2018; Hair et al., 2019). The model was statistically significant ($F(3,132) = 24.653$, $p < 0.001$) and explained 35.9% of the variance in WTP ($R^2 = 0.359$; Adjusted $R^2 = 0.345$). As reported in Table 6, perceived brand credibility was the only significant predictor of WTP (B = 0.548, SE = 0.139, β = 0.497, t = 3.942, $p < 0.001$). Environmental attitude (β = 0.155, p = 0.184) and environmental knowledge (β = −0.042, p = 0.655) did not exhibit significant independent effects. Although both variables were positively associated with WTP at the bivariate level, their effects did not remain significant once brand credibility was included, indicating the dominant role of credibility considerations in professionals' pricing decisions.

Regression diagnostics indicated no violation of key assumptions. All tolerance values exceeded 0.20 and VIF values remained below 3.3, suggesting no multicollinearity concerns. The Durbin–Watson statistic (1.878) indicated independence of residuals. Examination of standardized residuals and Cook's distance values (all < 1.0) revealed no influential outliers. Overall, the assumptions of linear regression were environmentalily met, supporting the robustness of the results.

Based on the regression findings, environmental attitude and environmental knowledge did not significantly predict WTP and therefore Hypotheses H1 and H2 were not supported. In contrast, perceived brand credibility demonstrated a strong and statistically significant positive effect on WTP (β = 0.497, $p < 0.001$), providing support for Hypothesis H3. A summary of the hypothesis testing results is presented in Table 7.

The following discussion interprets these results in light of the study hypotheses and prior literature.

This study examined the joint effects of environmental attitude, environmental knowledge,

Table 7. Summary of hypothesis testing results

Hypothesis	Relationship	Result
H1	Environmental Attitude → WTP	Rejected
H2	Environmental Knowledge → WTP	Rejected
H3	Brand Credibility → WTP	Supported

and perceived brand credibility on construction professionals' willingness to pay (WTP) a price premium for green-certified, low-GWP wall materials under conditions of standardized EPD-based environmental information. (Akerlof, 1970; Spence, 1973).

The findings demonstrate that perceived brand credibility plays a dominant role in shaping professionals' willingness to pay. Consistent with Hypothesis H3, brand credibility was the only variable that exerted a statistically significant independent effect on WTP in the multivariate model ($\beta = 0.497$, $p < 0.001$), explaining a substantial share of variance even after controlling for environmental attitude and environmental knowledge. This result extends signaling theory to the context of sustainable construction materials, indicating that brand credibility functions as a risk-reducing signal in markets characterized by long-term performance requirements, contractual liability, and reputational exposure (Spence, 1973; Kirmani & Rao, 2000). In such contexts, willingness to pay reflects not only valuation of environmental performance, but also considerations related to risk management, professional accountability, and institutional legitimacy (Erdem & Swait, 2004).

Notably, the effect of brand credibility remained strong despite the provision of standardized and transparent environmental information through EPDs. This suggests that credibility does not merely compensate for information deficits, but continues to shape economic decision making even under conditions of high informational clarity. Brand credibility therefore operates as a dominant evaluative heuristic that translates complex environmental performance data into professionally defensible and economically actionable procurement decisions (Akturan, 2018).

Environmental attitude and environmental knowledge were both positively associated with willingness to pay at the bivariate level, yet neither retained statistical significance in the multivariate analysis, leading to the rejection of Hypotheses H1 and H2. This pattern is theoretically consistent with the attitude–behavior gap literature, which suggests that favorable environmental orientations do not automatically translate into economic commitment when price premiums and professional responsibility are involved (Ajzen, 1991; Kollmuss & Agyeman, 2002; Vermeir & Verbeke, 2006). In construction procurement, decisions are embedded within budget constraints, regulatory obligations, and long-term liability considerations, conditions under which personal environmental concern alone appears insufficient to override credibility- and risk-related considerations (Young et al., 2010).

Similarly, the absence of a significant independent effect of environmental knowledge challenges the assumption that greater technical understanding of environmental impacts directly increases willingness to pay for sustainable materials. In professional construction contexts, knowledge of indicators such as GWP or embodied carbon does not necessarily mitigate concerns related to cost competitiveness, constructability, or performance uncertainty (Hertwich et al., 2019). Rather than acting as a direct driver of price acceptance, environmental knowledge appears to function as an enabling or interpretive condition that supports engagement with EPD information, but does not independently motivate economic commitment once credibility considerations are taken into account (Thøgersen, 2010).

These findings have important implications for information-based sustainability instruments, particularly Environmental Product Declarations. While EPDs enhance transparency and comparability of environmental performance, the results indicate that their market impact is conditional rather than automatic (ISO 14025, 2006; Del Borghi, 2013; White et al., 2019). Under standardized EPD information, willingness to pay remains primarily driven by brand

credibility, suggesting that EPDs function as necessary but insufficient background conditions for economic decision making. Their effectiveness depends on the presence of trusted and reputable brands capable of translating technical environmental data into signals that are institutionally legitimate and professionally defensible within procurement processes (Testa et al., 2016; Testa et al., 2018; Boström et al., 2019).

Beyond theoretical interpretation, the findings also carry practical implications for the construction industry. The dominance of brand credibility indicates that procurement decisions for low-GWP materials depend not only on transparent environmental information but also on the perceived reliability and past performance of suppliers. Therefore, promoting low-carbon materials requires strengthening reputational signals alongside improving EPD comparability. Manufacturers can enhance adoption through verified environmental claims, consistent performance, and participation in certified projects, while procurement teams may reduce uncertainty by incorporating supplier credibility and certification robustness into material evaluation processes.

CONCLUSION

This study examined how environmental attitude, environmental knowledge, and perceived brand credibility jointly shape construction professionals' willingness to pay (WTP) a price premium for green-certified, low-GWP wall materials under conditions of standardized EPD-based environmental information.

The results show that perceived brand credibility is the most influential determinant of WTP. Although environmental attitude and environmental knowledge were positively correlated with WTP, only brand credibility remained statistically significant in the multivariate model and explained a substantial share of the variance.

In high-stakes professional contexts, favorable orientations toward environmental issues and technical understanding alone are insufficient to justify price premiums once credibility and risk considerations are incorporated. Environmental concern therefore operates primarily as a background condition, while environmental knowledge may facilitate interpretation of EPDs but does not independently drive higher price acceptance when decisions are constrained by budgets, liability, and institutional expectations.

These findings highlight that, even under standardized EPD information, willingness to pay remains largely driven by brand credibility. This suggests that EPDs function as essential informational infrastructure but are not, by themselves, sufficient to motivate economic behavior. Their actual market influence depends on the presence of trusted brands able to translate complex environmental data into defensible procurement decisions.

Overall, the study contributes to sustainability and construction management research by demonstrating the limits of transparency-based approaches and highlighting the dominant role of credibility and trust in shaping professionals' economic commitment to low-GWP materials. The findings suggest that reputational and market dynamics outweigh attitudinal and knowledge-based drivers in procurement, even when high-quality environmental information is available.

The study also offers actionable insights for practitioners. For material manufacturers, the strong influence of brand credibility implies that investments in transparent communication, third-party verification, and consistent environmental performance can meaningfully enhance market acceptance. Demonstrating proven performance in completed projects, improving traceability of environmental claims, and participating in recognized certification schemes can further reinforce credibility signals for architects, engineers, and contractors.

For procurement professionals and project managers, the results underscore the importance of complementing technical environmental metrics such as EPDs with credibility-based evaluation

criteria. Integrating indicators such as supplier track record, reliability of environmental documentation, and consistency of past performance into procurement guidelines can help reduce perceived risk and support the adoption of low-carbon materials.

For policymakers, the findings indicate that transparency instruments such as EPDs are necessary but insufficient unless embedded in broader institutional frameworks that foster trust. Strengthening standardization and comparability, increasing verification intensity, and establishing publicly accessible national EPD databases may improve credibility. Policy initiatives that support accreditation, auditing, or certification schemes for suppliers of low-GWP materials could further ensure that transparent information is accompanied by trusted institutional signals.

Several limitations should be acknowledged. These limitations relate to methodological, measurement, contextual, and conceptual aspects of the study. Methodologically, although several raw variables exhibited statistical non-normality, residual-based diagnostics confirmed that the core assumptions of the OLS model were adequately met. Nonetheless, future research—especially with smaller samples or more skewed data—may benefit from robust or ordinal modeling to validate the stability of the observed relationships. Additionally, this study measured only willingness to pay (WTP) and not willingness to accept (WTA). Given that WTP and WTA may diverge due to endowment and loss-aversion effects, assessing both measures would offer a more comprehensive valuation of low-carbon building materials.

The cross-sectional survey design further limits causal inference. Longitudinal or experimental approaches could provide deeper insight into how credibility perceptions and environmental information evolve over time. The sampling frame, restricted to construction professionals in Tehran, represents a contextual limitation because procurement practices, regulatory environments, and sustainability market maturity vary across regions and countries. Comparative studies across diverse institutional settings would therefore strengthen generalizability. A further measurement limitation arises from the reliance on self-reported data, which may be affected by social-desirability or hypothetical-bias tendencies; future research could address these issues through behavioral experiments or revealed-preference approaches.

Conceptually, a limitation concerns how Environmental Product Declarations were incorporated into the analytical framework. EPDs were treated as standardized background conditions rather than as an explanatory construct, limiting examination of how information quality, interpretability, and trust interact with procurement criteria. Building on these methodological, contextual, and conceptual limitations, several directions for future research emerge. Future studies should develop integrative models that capture how professionals perceive and utilize EPD information within multi-level procurement environments. Further differentiation of environmental attitude and knowledge dimensions may reveal indirect pathways influencing WTP through credibility, risk perception, or accountability. More broadly, future research should examine how credibility is constructed and reinforced through certification systems, policy incentives, and institutional trust mechanisms to support market transitions toward low-GWP construction materials.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

ETHICAL APPROVAL

Not Applicable.

GRANT SUPPORT DETAILS

The present research did not receive any financial support.

LIFE SCIENCE REPORTING

No life science threat was practiced in this research.

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