

CRITERIA FOR SUSTAINABLE INTERIOR DESIGN SOLUTIONS

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ABSTRACT

Interior designers around the world have developed a greater awareness of sustainable strategies as the demand for sustainable interior design solutions has increased. Most traditional interior design construction processes have an adverse environmental impact due to the significant consumption of natural resources during manufacturing and installation. In this context, interior designers have the opportunity to adopt sustainable design practices and enhance healthy indoor air quality. They can adhere to sustainable solutions through their choices during the design realization phase, including decisions on materials selection, construction methods, furnishing, and lighting. Despite the abundance of sustainable design research, few studies have addressed the criteria for interior design sustainability. Determining selection criteria for sustainable interior design solutions is important in assisting responsible interior designers. Hence, the objective of this research is to propose a set of criteria for selecting sustainable interior design solutions based on a comprehensive literature review. The paper concludes by reinforcing the importance of having a functional and effective set of criteria to ensure consistent sustainable interior design solutions.

Keywords: interior design, sustainability, sustainable interior design, sustainable solution criteria.

1 INTRODUCTION

The world has limited resources and has experienced steady population growth for centuries. Recently, climate change concerns have grown tremendously across the globe alongside scientific evidence on the effects of greenhouse gases on the environment [1]. The situation paints a negative future for our environmental resources; consequently, an awareness of the importance of sustainable practices is needed [2]. Conserving environmental resources has social, cultural, physical, and economic impacts, including the ability to sustain lifestyle requirements, a healthy economy, reduced global warming, and decreased toxic gas emissions [3]. This has led to dialogues with the aim of saving our planet by controlling consumption and sustaining natural resources [4].

Sustainability has been recognized as a significant issue across a variety of fields including interior design. Interior designers have a moral responsibility to help protect, preserve, and restore the global ecosystem [5]. Sustainability in interior design is becoming a vital concern due to the extensive resources needed for interior use. Sustainable interior practices are actions that lessen environmental impacts and create a healthy environment [6], [7]. In this context, sustainable interior design can be defined as the rationalization of natural resources used in a manner that sensibly addresses the impact of all design aspects on the environment [8]. Although the cost efficiency of sustainability is a challenging issue, interior designers who focus on environmentally responsible design plan, specify, and execute solutions for interior environments that reflect concern for both the world's ecology and the inhabitants' quality of life [9]. Sustainable interior design solutions can be achieved by following interior design practices such as creating design spaces that can easily adapt to changes in the spaces' activities, efficient energy conservation and materials management, and giving occupants access to thermal comfort controls and outdoor views [10]. Interior designers can effectively contribute to the sustainability effort by specifying durable local materials, selecting rapidly



renewable materials, and using energy-efficient lighting and plumbing systems [11], [12]. Interior designers should embed smart technology that promotes highly efficient spaces while significantly minimizing operating costs through the accurate monitoring and intensive control of resource consumption and the facilitation of renewable energy usage [13].

Interior designers juggle clients' desires and concerns, cost factors, time restraints, and technology; sustainability adds yet another factor to this mix [14]. A successful project will blend sustainability into each phase of the design process, its execution, and post-occupancy [10]. Many interior designers around the world have developed a greater awareness of the need to integrate sustainable strategies into their design solutions; they consider sustainability as inherent to their work and no longer an added value [15]. This attitude has been supported by increased demand for sustainability in recent years that encourages and accelerates the shift of materials and producers toward sustainable principles and practices during the manufacturing process [16]. International and local sustainability associations have also helped to adopt and standardize sustainable practices worldwide; they offer rating and certification systems that help the industry and designers evaluate product and system sustainability [5], [17].

Sustainable interior design should ignite the spirit of sustainability and be a catalyst for change. Interior designers need a clear selection criteria for sustainable treatments and products, as well as benchmarks for high-performance sustainable interior design solutions to achieve integrity in their design solutions. Thus, this paper explores the selection criteria for sustainable interior design solutions.

2 SELECTION CRITERIA FOR SUSTAINABLE INTERIOR DESIGN SOLUTIONS

Sustainable design solutions differ from conventional design solutions by supporting healthy environments as well as rationalizing resource and energy consumption [18]. Responsible interior design solutions should present a logical and sequential process for creating healthy, functional, comfortable, and sustainable interiors without compromising aesthetic factors, while meeting the clients' needs, budget, schedule, and design vision [19], [12]. Designers should articulate sustainability in all aspects of their design solutions and ensure healthier indoor air quality by choosing materials and construction methods that prevent indoor air pollution, harmful chemical reactions, and gas emissions [8]. Designers should be mindful about providing ecologically intelligent solutions for energy efficiency that can reduce the rate of energy and water consumption while providing a comfortable space [20]. They should encourage the use of durable products that do not require an inordinate amount of maintenance and replacement [21]. Designers should support the reduction of construction waste to lessen pollution and environmental damage [22]. They should ensure that specified solutions and materials are from local or international certified sources [5]. Thus, interior designers need a clear selection criteria for sustainable items to achieve integrity in their design solutions [1]. They also need benchmarks for high-performance sustainable interior design solutions. In this study, a literature review was conducted to identify the selection criteria for sustainable items that can be employed in interior design solutions. Candidate criteria were identified through a thematic analysis. The following sections present the suggested criteria that can support interior designers in monitoring their design solutions and in their research, selection, and specification processes for fixed interior finishes, furniture, furnishings, or equipment.



2.1 Manufacturers' selection criteria

2.1.1 Identify and evaluate sustainable manufacturers

This criterion requires searching for manufacturers and suppliers that have adopted sustainability as a corporate priority and committed to environmental values [17]. Interior designers should actively track and review the operations and policies of companies that declare their products as environment friendly and should evaluate their effort to improve health and environmental consciousness. This can be achieved by analyzing data from the Global Reporting Initiative, which provides manufacturers with guidelines on reporting their level of sustainable stewardship [23]. Interior designers should study the following to ensure the companies' commitment to sustainability: First, interior designers should study companies' plans and evaluation systems for energy optimization, usage of renewable energy and materials, management of production waste, reduction of raw materials and product transportation, use of recyclable packaging, and any other environmental initiatives [4]. Second, interior designers should study companies' reduction or avoidance of any chemicals of concern in their product treatment that might lessen the product's biodegradability and harm users' health [8], [25]. Third, interior designers should ensure their products' ease of disassembly for the purpose of reuse and recycling [14], [26].

Interior designers should rely on trustworthy information to meet this criterion and successfully select sustainable products for their design solutions. They should know the product's complete ingredients and impacts on health and the environment before specifying it in order to honor their commitment to deliver safe, healthy, and high-performing interiors [2]. Designers need comprehensive, truthful information from a third party to rate the sustainability of manufacturing interior products and systems [9]. Product declarations and certifications lead to consistent product sustainability evaluations [2], [5].

2.1.2 Sustainable product declarations

The main goal of product declarations is to standardize reporting to make it easy to understand; product declarations provide consistency within the industry, allow the comparability of products, and support designers' decisions [3], [17]. There are two types of product declarations that categorize products by defining environmental performance through specific rules for different product types. First, an Environmental Product Declaration is based on a life-cycle assessment (LCA) that aims to measure the product's impacts from the extraction of raw materials until the end of the product's life [27]. Second, a Health Product Declaration is based on the transparency of product ingredients; it aims at comparable evaluation and identifies how a product affects users' health. Support for this criterion will be from proactive manufacturers who share product information by providing a summary of the product's environmental characteristics [28].

2.1.3 Sustainable product certifications

Sustainable standards are essential to creating benchmarks through a set of criteria for determining the quality, safety, value, and health impact of a product or service [14]. These standards are used to scrutinize the environmental and health claims of sustainable products based on their impacts on humans and the environment. A sustainable product certification confirms and validates that a product meets certain outlined sustainable standards [17]. A certification should be transparent about the product's use of environmental materials in accordance with precautionary principles to reduce or eliminate suspicion regarding harm to humans or the environment. Such certifications encourage transparency in the building products industry from extraction until the end of the product's life [9]. Certifications provide



systems-based guidelines that can further empower designers to make informed decisions about specifying, maintaining, and disposing building products [3]. These decisions are based on the following principles: taking precautionary actions and measures, seeking out and evaluating alternatives, and shifting burdens of proof [5]. Interior designers should review different certifications issued through multiple regulatory entities to ensure that this information is reliable, and they should be updated as new, relevant data emerges [29]. This will help designers classify green chemicals, sustainable substances, and environmentally preferable products to avoid harm to the health and environment [3], [19]. Numerous certification bodies are working to advocate and implement sustainable precautionary principles through comprehensive product databases. The types of certification include the following:

1. *Multi-attribute certifications* distinguish products based on an assessment of the products' full life cycle to help identify excellent products in key areas such as material composition, manufacturing impacts, energy use, and emissions [2], [3].
2. *Single-attribute certifications* describe the majority of sustainable product certifications. They focus on one area of performance, such as water/energy efficiency or product/material emissions [17].
3. *First-party or self-certification* is a manufacturer's marketing claim for its own products or operations as set forth in product brochures, specifications, and material safety data sheets. None of this information is confirmed, validated, or independently tested by other parties [5].
4. *Second-party certification* is based on the level of standards set by an industry trade association or an outside consulting firm for a certain group of manufacturers. In this process, manufacturers regularly supply documentation and evidence that certain levels are adhered to and maintained, although there is no guarantee against potential conflicts of interest [17].
5. *Third-party certification* is a comprehensive process by which a product, process, or service is reviewed by a reputable, independent, and unbiased third party and meets an established set of criteria and standards. It is the most rigorous tier of certification; it involves an impartial and transparent review process that includes documentation of the review method and gives equal treatment to each product reviewed. An independent third party leads the product testing and awards the certification. In certain cases, as an additional layer of quality control and to ensure objectivity, the certifier may be evaluated by another association such as the International Standards Organization or the American National Standards Institute (ANSI). Recently, third-party certifications have been focusing on multi-attribute certifications by analyzing a single product through multiple lenses [3], [17].

2.1.4 Sustainable product life-cycle assessment

Designers should use finishing materials and products that have minimal environmental impacts throughout their entire life cycle [12]. An LCA is a quantitative and qualitative assessment of all phases of a product's life, including raw material harvesting/extraction, manufacturing, installation/assembly, transportation, usage, and post-use or end of life [30]. Manufacturers must assess a product's impacts and components to understand its full cradle-to-grave impacts [16]. Companies must adopt LCA's holistic approach and share the results with the rest of the industry through transparent reporting [29]. It is challenging to interpret and calculate the environmental and health impacts for every input and output of a product throughout its life [19]. A product may be harvested sustainably but treated with harmful



chemicals during the manufacturing process. For example, unfinished wood can be treated with preservatives containing biocides to ward off fungal staining. These toxic chemicals attack living organisms and expose them to reproductive and developmental toxicants plus carcinogens, which are then released into the air, compromising air quality [1]. In addition, although a product may be sustainably manufactured, transport over a long distance will lead to high energy consumption [5]. LCA strives to evaluate a comprehensive list of impacts, including environmental toxins that compromise ecosystems, reduction of natural resources, freshwater stewardship, degradation of ecosystems and habitat destruction, social responsibility, and toxic chemicals affecting human health [19]. Scientifically rigorous and analytical LCA results will empower designers, manufacturers, and consumers to make more fully informed decisions [3]. Therefore, manufacturers must transparently communicate the results relevant to their manufacturing processes and account for their product's impact on people and the planet [1], [14].

To meet this criterion, interior designers should identify reliable LCA methodology and select products that have been compared and certified by a third-party organization relying on similar standards. The following third-party certifications can support interior designers' decisions. First, a Cradle to Cradle certificate requires the attainment of multiple attributes related to safety for human health and the environment through all use phases: product and system design for material reutilization, the use of renewable energy and carbon management, efficient use of water and energy associated with production, and company strategies for social fairness [31]. Second, SMaRT Certified Products is an ANSI-accredited standard. The rating system has multiple attributes and four tiers covering all product stages. It includes environmental, economic, and social criteria for building products, fabrics, textiles, and flooring [32].

2.2 Health criteria

2.2.1 Indoor air quality performance

People spend an average of 90% of their time indoors; thus, indoor air can be a greater health hazard for building occupants than outdoor air [2]. Indoor environmental quality refers to all the factors that contribute to how occupants experience, interact with, and are affected by the built environment [18]. These factors include indoor air quality (IAQ), lighting and day lighting, connection to nature, thermal comfort and control, and electromagnetic fields [1]. The objective of this criterion is to identify assessment tools that can be used by interior designers to measure the IAQ of any building against government guidelines that establish baseline efficiency for air purification and filtration systems. IAQ assessment covers microbial contaminants (e.g., mold, bacteria, dust, and particulates), chemicals (e.g., carbon monoxide and radon), allergens, fibers (asbestos), and any mass or energy stressor that can affect the occupants' health [33]. Interior designers can employ tools such as the Indoor Air Quality Building Education and Assessment Model for the design and construction phase. Although it is challenging to measure the toxicity of a building's interiors and its environmental impacts, there are some methods to determine IAQ. Interior designers, in collaboration with scientists, can collect and analyze air samples and can use computer software simulating the airflow inside buildings [8]. Smart IAQ devices are effective technical tools for collecting and analyzing data about the unwanted components of indoor air [13]. This analysis can lead to an understanding of the sources of the contaminants and guide designers in developing strategies for removing the unwanted air elements and determining the balance required for ventilation and filtration for the effective exchange of indoor air [1].



2.2.2 Control chemical emission

The Intergovernmental Panel on Climate Change reported that the buildings sector is responsible for 40% of global energy consumption and 25% of global carbon dioxide emissions [25]. Emerging chemicals of concern (ECCs) can cause adverse effects on the environment and health. They are generated within the interior environment through irresponsible usage of combinations of materials and/or adhesives [18]. Examples of ECCs are nitrosodimethylamine, bisphenol-A, phthalates, perchlorate, arsenic, synthetic musks, nonylphenols, industrial chemical additives, adjuvants, brominated flame retardants, stabilizers, and nanoparticles [33]. Smog-causing pollutants and particulate matter also have serious health and environmental impacts.

One of the responsibilities of interior designers is to provide interiors that promote the health, safety, and welfare of a building's occupants [1]. Therefore, designers must research and thoroughly vet the materials and products they specify and warn their clients of potential enduring health risks. Moreover, designers should analyze the feasibility of substituting a product with a safer alternative [34]. Designers can eliminate the risk of ECCs by analyzing marketing claims about the product's impact on health. They should dive deep into the information on products such as paints, adhesives and sealants, waterproofing, textiles, furnishings, insulation, drywall, and substrates to ensure that everything has been evaluated to deliver the highest quality interior environment [21]. They should determine the level of toxic gas emissions, whether generated during production or during product usage [35]. Interior designers should specify natural sources such as wood, plant products, and mineral products (e.g., natural stone and slate shingles) after evaluating the impact of their extraction on the natural environment [26], [34]. Natural sources are low emitting, durable, require less energy to make a usable product from, and are less likely to off-gas chemicals or volatile organic compounds (VOCs) during manufacture or disposal [1]. When interior designers specify manufacturing materials, they should look to manufacturers that comply with standards and testing by reporting their VOC emission levels [35]. They should ask for information on suspended VOCs (SVOCs), carbon-based substances that become gaseous under certain conditions and are released through particulates in the air. SVOCs include glycol-based solvents, nonylphenol surfactants, phthalates, and some flame retardants [34], [35].

The following two tools guide interior designers in selecting manufacturing materials and products that have zero or low impact on occupants' health or the environment. The first tool, GreenScreen for Safer Chemicals, is a comparative process that includes standards, scorecards, and eco-labels. It uses chemical hazard assessment to identify chemicals of particular concern and safer alternatives. It is a valuable tool for assessing whether materials and products meet regulatory requirements, supporting healthy and responsible design and development, defining materials procurement that meets client demand and eliminates chemicals of concern, and finding safer alternative chemicals for product formulations [5]. The second tool is the amended Clean Air Act of 1990, which established standards issued by the Environmental Protection Agency to control emissions and toxic pollutants. These standards strive to reduce the emissions of more than 100 airborne toxins. When fully implemented, these standards will reduce toxic emissions by about 1.5 million tons per year—almost 15 times the reductions achieved prior to 1990 [17].

2.2.3 Carbon footprint

Interior designers should specify products and materials that help decrease carbon impacts and offset emissions [35]. They should select items manufactured in response to the uptick in dramatic weather events and changing climatic patterns [34]. They need to look for



manufacturers that examine the greenhouse gas emissions generated by their products [21]. To meet this criterion, designers can rely on the Climate Neutral Business Network as a third-party certification body that measures products' impact on climate change; the network aims for net-zero greenhouse gas emissions associated with a product's life cycle and works to reduce products' potential contributions to climate change [17].

2.2.4 Biodegradable products

A biodegradable product is capable of being decomposed by biological agents or being broken down, especially into harmless products, by the action of living things [3]. Anything that decomposes without polluting the area or leaching toxins is biodegradable, such as all-natural materials including wool, jute, and biodegradable adhesive [5]. Interior designers should look to a viable certification program such as the Biodegradable Products Institute, which recognizes that products must disintegrate quickly with no residue, convert to water and biomass, support plant growth, and not introduce high levels of metals into the soil. Such products include food service items, packaging, and compostable resins [36].

2.3 Reduction of consumption

2.3.1 Design adaptability

To meet this criterion, interior designers should challenge their capability to design spaces that adapt to clients' needs with the minimum usage of area and resources [12], [24]. Responsible designers should invest their time in producing innovative and flexible solutions [37]. Design adaptability can be achieved, for instance, by designing multipurpose spaces and multifunction furniture as well as relying on smart technologies that provide spaces with the flexibility to change their design atmosphere through smart materials and lighting to fit different activities [10], [38]. Interior designers should utilize the attributes of a material for more than one purpose, resulting in the reduced use of materials [3], [26]. Concrete, for example, can be used as both the structure and finish of flooring.

2.3.2 Regional design solutions

Interior designers should encourage vernacular design solutions that support the usage of regional products and materials [3]. This trend will help lessen the significant environmental impact of the energy needed to transport products over a long distance [25]. The natural harmony between the materials and their environment will increase their durability as well as support the local economy and design identity [39].

2.3.3 Durability

Interior designers should specify durable, low-maintenance products and materials for their design solutions while considering efficient installation methods and the suitability of their application [11]. These solutions can be considered environmentally friendly because they have longer life cycles and need to be cared for and replaced less frequently [21]. Durable products may cost more up front, but they will save money in the long run [40]. Tile, stone, and concrete are examples of products that can be considered durable [34].

2.3.4 Reduce packaging

Packaging waste represents as much as a third of the non-industrial solid waste stream. Therefore, responsible design practice requires asking manufacturers to package their products in an environmentally accountable fashion [5]. Specifically, designers can request minimal packaging, the use of only recycled-content materials that are diverted from disposal at the landfill, biodegradable plastic, materials free from toxic components, and packaging



materials that can be returned for reuse or recycling [24]. The associated reduction in waste and disposal cost translates into cost savings for the contractor and owner. Interior designers can employ different associations' standards to meet this criterion; for instance, they can select products holding the Blue Angel Mark, an environmental label system that is promoted by the German government for numerous products, including furniture and finishes [2], [17].

2.4 Sustainable design components

A comprehensive and successful sustainable design solution requires diligent planning and incremental implementation; it should be capable of being disassembled, refurbished, reused, or recycled, and its return should be incentivized.

2.4.1 Reusable design components

Interior designers should specify materials and components that have the potential to be reused or recycled after their useful life [21], [26]. Designers should encourage the use of repurposed or refurbished furniture whenever possible to extend material life [10]. Antiques and collectible furniture exemplify the beauty of repurposing and refurbishing. Designers should rely on contemporary mechanical solutions as interior design finishing and construction methods that will minimize wasted material because the construction can be disassembled in a suitable condition that allows for materials to be reused in different locations [18], [22]. Interior designers can introduce the reuse and recycle water system and convince their clients to maximize water management efficiency within buildings by reducing water consumption and reusing wastewater [4].

2.4.2 Recyclable design components

Recycling is the process of collecting, processing, marketing, and ultimately reusing materials that have been discarded [6]. Interior design waste management is an example of recycling in which construction waste is collected from the renovation process and then transformed and remanufactured to produce new construction materials [21], [22]. The life cycle of interior materials should involve the frugal use of natural resources and contribute to addressing environmental issues such as global warming and acidification [12], [18]. These benefits associated with recycling cannot be realized unless a market exists for recycled-content products. Therefore, interior designers should specify products with recycled content to ensure that the recycling movement continues [10], [24]. Creating a demand for recycled content can transform entire manufacturing markets. Products made with recycled resources offer countless benefits, including reusing design components, reducing the volume of waste sent to landfills and incinerators, and decreasing the demand for raw materials, thereby lessening the environmental impacts associated with material extraction and harvesting and resulting in business expansion and additional jobs as new product technologies emerge [2], [3].

2.5 Efficient design resource management

2.5.1 Selecting renewable resources

Renewable resources are defined as those naturally replenished or grown at a faster rate than their usage lifetime and human consumption [7]. Renewable resources are materials that consume less energy in their preparation, are capable of being reused or recycled when disposed of at the end of their life cycle, and have lower VOC emissions [26]. Renewable materials should have less environmental impact associated with their cultivation, should be grown without pesticides, should not be invasive to the growing area, and should not deplete



topsoil or contaminate waterways; they are biodegradable and require minimal machinery to harvest [3], [11]. They should be able to replenish themselves through short harvest rotations—typically less than 10 years. Therefore, renewable materials are considered one of the factors that can positively reduce the environmental impact of interiors. Bamboo, wheat board, wool, cotton, coir and jute fabrics, linoleum, and cork are examples of self-sustaining material; they can be harvested every five to 10 years [2], [21].

2.5.2 Effective plumbing systems

Interior designers should specify sanitary equipment to reduce water consumption, such as water-efficient sinks and smart faucets [2]. They should advocate plumbing systems that encourage graywater reuse for toilet flush or irrigation systems [4]. In the long term, this will reduce the energy and transportation required for water purification and conserve potable water [24].

2.5.3 Effective energy performance

Interior designers should work closely with project team members such as electrical and mechanical engineers to optimize energy use and minimize energy consumption while meeting the clients' needs [3], [18]. Architects and interior designers should begin with a computer-generated energy model to determine how various design elements will affect the project's energy efficiency [25]. This stage will help them set the threshold for design performance toward an energy-efficient building envelope including windows, doors, walls, insulation, roof assemblies, appliances, systems, and equipment. Designers should distinguish their designs by balancing the high-performing envelope with renewable on-site energy like solar or wind power [20]. Interior designers should also specify systems that can rationalize interior resource consumption using smart equipment that monitors space conditions and occupancy, and then implement strategies for limiting energy use to the occupied areas [41]. Ultimately, they should work toward net-zero energy whenever possible. Another aspect of achieving effective energy performance that designers should consider is the amount of energy required to produce design components. Natural resources have lower amounts of embodied energy, while synthetic materials such as concrete, steel, and acrylic require higher levels [10].

2.5.4 Efficient construction methods

This criterion aims to encourage the specification of furniture and finishes that are processed minimally and inherently part of the construction. Interior designers should specify simple construction methods with minimal installation processes [26]. They should choose durable fixtures, joints, and fittings for assembly, as well as rely on innovative technologies and creative mechanisms to assemble different items based on a shared installation application that will present a stronger and less material-intensive option than using individual components for each particular item [3], [24]. This process will reduce assembly fixtures, resulting in the decrease of needed natural materials and resources as a whole, in addition to easing the maintenance and repair process. Another example of sustainable construction is utilizing the inherent strength of wood with a system of self-locking joinery to hold furniture components that will slide and lock into one another, allowing for the seasonal movement of wood with minimal warping or loosening of the structure; this is an alternative sustainable solution to utilizing screws, nuts, bolts, or other fasteners for assembling furniture pieces that loosen with age [17].



3 CONCLUSION

Interior designers should recommend and specify only earth-friendly and healthy materials and products. They should challenge their design capabilities, determine the appropriate innovative solutions to achieve energy efficiency, and eventually aim for net-zero-energy interiors that are truly restorative for both clients and the environment. Interior designers and contractors should integrate sustainable practices into all of their interior design solutions and lead their teams to seamlessly and routinely practice sustainability principles.

This paper explored and identified selection criteria for sustainable interior products and materials. It proposed five criteria covering manufacturer selection, health, reduced consumption, sustainable design components, and efficient design resource management. These criteria can effectively support responsible interior designers in specifying and selecting sustainable design solutions. Interior designers should have a complete understanding of these selection criteria to fully incorporate them into their project specifications.

Meeting just one or two of the criteria does not mean that the product is sustainable. Designers should work on balancing the scale, evaluating the pros and cons, and selecting the appropriate solution to meet the sustainable project's objectives and ensure the effectiveness of the selection criteria.

Appropriate quantitative methods can be used to translate the selection criteria into a mathematical evaluation system and develop a scoring system based on the extent to which each criterion is achieved. Such a system can reinforce interior designers' efforts to evaluate project sustainability and ensure that they achieve consistent sustainable interior design solutions.

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