




ADOPTION OF ESG PRACTICES IN PROJECT MANAGEMENT WITH A FOCUS ON IMPLEMENTING EDGE CERTIFICATION

ADOÇÃO DE PRÁTICAS ESG NA GESTÃO DE PROJETOS COM FOCO NA IMPLEMENTAÇÃO DE CERTIFICAÇÃO EDGE

ADOPCIÓN DE PRÁCTICAS ESG EN LA GESTIÓN DE PROYECTOS CON ENFOQUE EN LA IMPLEMENTACIÓN DE LA CERTIFICACIÓN EDGE

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Eduardo Custódio Guarabyra¹, Heloísa Thaís Rodrigues de Souza², Rayane Fontes Mota³

ABSTRACT

The construction industry is one of the sectors with the greatest environmental impact. This reality has led companies in the sector to adopt more sustainable practices, seeking to reduce their environmental impact and meet new market demands. Given the above, this study, conducted in Brazil in 2025, analyzed how EDGE certification can be implemented in construction project management to promote sustainability. The research sought to answer the question of how to integrate EDGE certification into project management processes in the Brazilian construction industry and what the main obstacles to its adoption are. The initial hypothesis was that EDGE certification would bring significant economic, social, and environmental benefits. The overall objective of the research was to apply project management to the implementation process for obtaining EDGE certification. The specific objectives were: to assess the economic impacts of adopting EDGE certification and to present the results of EDGE-certified projects and their cost-effectiveness, through sustainable technical solutions. The research used a qualitative and descriptive approach, with data collection based on case studies and comparative analyses, comprising exploratory research. The results indicated that EDGE certification significantly reduces energy and water consumption, as well as CO2 emissions and waste generation. The conclusion is that EDGE certification is an effective tool for promoting sustainability in the Brazilian construction industry, transforming organizational culture and providing significant competitive advantages.

Keywords: EDGE Certification. Sustainability. Civil construction. Project Management. Brazil.

RESUMO

A construção civil é um dos setores mais impactantes para o meio ambiente. Essa realidade tem levado as empresas do setor a adotarem práticas mais sustentáveis, buscando reduzir seu impacto ambiental e atender às novas demandas do mercado. Diante do exposto, este estudo, realizado no Brasil em 2025, analisou como a certificação EDGE pode ser

¹ Postgraduate in Hospital Engineering and Architecture. Faculdade de Administração, Negócios e Saúde de Sergipe (FANESE). E-mail: ecguarabyra.consultoria@gmail.com

² Dr. in Development and Environment. Faculdade de Administração, Negócios e Saúde de Sergipe (FANESE). E-mail: heloisathaisrs@gmail.com Orcid: <https://orcid.org/0000-0002-2850-1961>
Lattes: <http://lattes.cnpq.br/1794025305136796>

³ Civil Engineer. Faculdade Líbano. E-mail: eng.rayanefontes@gmail.com

implementada na gestão de projetos da construção civil para promover a sustentabilidade. A pesquisa buscou responder à questão de como integrar a certificação EDGE nos processos de gestão de projetos na construção civil brasileira e quais os principais obstáculos para sua adoção. A hipótese inicial era que a certificação EDGE traria benefícios econômicos, sociais e ambientais significativos. O objetivo geral da pesquisa foi aplicar a gestão de projetos no processo de implementação para obtenção da certificação EDGE. E como específicos têm-se: Avaliar os impactos econômicos da adoção da certificação EDGE e Apresentar os resultados de projetos com a certificação EDGE e sua economia, mediante soluções técnicas sustentáveis. A pesquisa utilizou uma abordagem qualitativa e descritiva, com coleta de dados baseada em estudos de caso e análises comparativas, compreendendo uma pesquisa de cunho exploratório. Os resultados indicaram que a certificação EDGE proporciona uma redução significativa no consumo de energia e água, além de diminuir as emissões de CO₂ e a geração de resíduos. Concluiu-se que a certificação EDGE é uma ferramenta eficaz para a promoção da sustentabilidade na construção civil brasileira, transformando a cultura organizacional e proporcionando vantagens competitivas significativas.

Palavras-chave: Certificação EDGE. Sustentabilidade. Construção Civil. Gestão de Projetos. Brasil.

RESUMEN

La industria de la construcción es uno de los sectores con mayor impacto ambiental. Esta realidad ha llevado a las empresas del sector a adoptar prácticas más sostenibles, buscando reducir su impacto ambiental y satisfacer las nuevas demandas del mercado. Por lo anterior, este estudio, realizado en Brasil en 2025, analizó cómo se puede implementar la certificación EDGE en la gestión de proyectos de construcción para promover la sostenibilidad. La investigación buscó responder a la pregunta de cómo integrar la certificación EDGE en los procesos de gestión de proyectos en la industria de la construcción brasileña y cuáles son los principales obstáculos para su adopción. La hipótesis inicial fue que la certificación EDGE aportaría importantes beneficios económicos, sociales y ambientales. El objetivo general de la investigación fue aplicar la gestión de proyectos al proceso de implementación para la obtención de la certificación EDGE. Los objetivos específicos fueron: evaluar los impactos económicos de la adopción de la certificación EDGE y presentar los resultados de los proyectos con certificación EDGE y su rentabilidad, mediante soluciones técnicas sostenibles. La investigación utilizó un enfoque cualitativo y descriptivo, con recopilación de datos basada en estudios de caso y análisis comparativos, que comprendían una investigación exploratoria. Los resultados indicaron que la certificación EDGE reduce significativamente el consumo de energía y agua, así como las emisiones de CO₂ y la generación de residuos. La conclusión es que la certificación EDGE es una herramienta eficaz para promover la sostenibilidad en la industria de la construcción brasileña, transformando la cultura organizacional y brindando importantes ventajas competitivas.

Palabras clave: Certificación EDGE. Sostenibilidad. Construcción Civil. Gestión de Proyectos. Brasil.



1 INTRODUCTION

Civil construction is one of the most impactful sectors for the environment. It consumes large amounts of natural resources and generates a lot of waste. To give you an idea, about 40% of the materials extracted from the planet are destined for construction. In addition, buildings are responsible for approximately 30% of global energy consumption (Wang; Xue, 2023). This reality has led companies in the sector to adopt more sustainable practices, seeking to reduce their environmental impact and meet new market demands.

The concept of Environmental, Social, Governance (ESG) emerged as a response to this need. ESG involves practices that aim at environmental sustainability, social responsibility, and transparency in corporate governance. In recent years, the integration of ESG criteria in construction project management has become a growing trend. Construction companies have started to incorporate eco-friendly materials, smart technologies, and governance practices to improve their performance and meet the expectations of investors and consumers (Mitsidi Projetos, 2024).

Market pressure, stricter environmental laws, and customer demand for green buildings have driven this change. The market increasingly demands that companies adopt sustainable practices, not only for ethical reasons, but also for tangible benefits, such as reducing operating costs and strengthening the corporate image. In addition, construction is responsible for a significant portion of CO₂ emissions, water consumption, and waste generation, which reinforces the need for more responsible practices (ESGpedia, 2025).

In this context, the Excellence in Design for Greater Efficiencies (EDGE) certification has emerged as a practical tool to promote sustainability in construction. Developed by the International Finance Corporation (IFC) in 2014, EDGE certification aims to encourage energy efficiency, waste reduction, and the responsible use of natural resources in buildings. The certification stands out for its simplicity of application and accessibility, especially in emerging markets such as Brazil (Green Finance Platform, 2024).

Compared to other certifications such as Leadership in Energy and Environmental Design (LEED) and High Environmental Quality (AQUA), EDGE differentiates itself by its focus on resource efficiency and ease of implementation. While other certifications can be more complex and costly, EDGE offers a more practical and cost-effective alternative, allowing a greater number of projects to achieve high sustainability standards (Sustainib.co.uk, 2024). Therefore, the adoption of ESG practices and EDGE certification



represent an important advance in the search for a more sustainable and responsible civil construction.

In view of the above, the present research answers the following problematizing questions: How to integrate EDGE certification into project management processes in Brazilian civil construction? What are the main technical, financial, and cultural hurdles that companies face when trying to adopt sustainable practices? How can EDGE certification help overcome these challenges and affect the costs and financial return of buildings?

Construction companies know they need to change, but they run into several barriers. The higher initial cost is scary. The lack of technical knowledge gets in the way. Traditional processes resist change. So, how to make this transition efficiently? EDGE certification promises practical solutions, but does it work in the Brazilian reality? This work seeks these answers.

The present research shows how EDGE certification can be implemented in the management of Brazilian civil construction projects to promote sustainability. It is checked how much it costs to implement, how long it takes and what results it brings. A step-by-step guide is also created to help Brazilian companies adopt this system. Finally, it is proven with numbers that it is worth investing in projects with this certification.

The general objective of the research was to apply project management in the implementation process to obtain the EDGE certification. And the specifics are: Evaluate the economic impacts of the adoption of EDGE certification and Present the results of projects with EDGE certification and their economy, through sustainable technical solutions.

Thus, this work aims to contribute to the advancement of knowledge about the application of EDGE in certification processes in the civil construction industry. This study follows the research guidelines established by (Wang; Xue, 2023), (Mitsidi Projetos, 2024) and (ESGpedia, 2025), which highlight the importance of integrating sustainable practices in civil construction.

The importance of this study is evident both in the academic and professional and social spheres. In the academic field, it fills a significant gap in the literature on sustainable certifications applied to the Brazilian reality. Many studies focus on theories and practices developed in other countries, which do not always adapt well to the Brazilian context. This work, therefore, contributes to knowledge by providing a detailed and practical analysis of the implementation of EDGE certification in Brazil (Wang; Xue, 2023).



From a professional point of view, the results of this study can be extremely valuable for companies in the construction sector. By demonstrating how EDGE certification can be implemented effectively, the study offers a practical guide for companies looking to adopt more sustainable practices. In addition, by assessing the economic impacts of certification, the study can help companies better understand the financial return on their investments in sustainability (Mitsidi Projetos, 2024).

In the social and environmental sphere, the adoption of sustainable practices in civil construction brings numerous benefits. Reducing pollution, saving natural resources, and improving the quality of life are just some of the positive impacts that can be achieved. EDGE certification promotes energy efficiency and waste reduction, contributing to a healthier and more sustainable environment. Therefore, this study not only benefits companies, but also society as a whole (ESGpedia, 2025).

In addition, the study has significant practical value in proposing a model for implementing EDGE certification adapted to the Brazilian reality. Companies need clear and practical guidance to overcome the technical, financial, and cultural challenges they face in adopting sustainable practices. This work offers just that, providing a detailed step-by-step guide to implementing EDGE certification, which can ease the transition to more sustainable practices (Sustainib.co.uk, 2024).

Finally, the relevance of this study is reinforced by the urgency of the environmental issue. Civil construction is one of the sectors that most impacts the environment, being responsible for a large part of CO₂ emissions and the consumption of natural resources. Therefore, the adoption of more sustainable practices is an urgent need. EDGE certification offers a practical and effective solution to this issue, and this study shows how it can be implemented efficiently in Brazil, bringing economic, social, and environmental benefits (Green Finance Platform, 2024).

2 CURRENT OVERVIEW OF EDGE CERTIFICATION IN BRAZIL

The mapping of EDGE-certified buildings in Brazil shows steady growth in recent years. Since the introduction of certification in the country, several companies have adopted this practice to promote sustainability in their constructions. Currently, there is a diversified geographical distribution, with certified projects in several regions, including the Southeast, South and Midwest. The types of construction vary between residential, commercial and industrial, with emphasis on large projects by renowned companies (Mitsidi Projetos, 2024).



The annual evolution of EDGE certification in Brazil reflects a significant increase in the number of certified projects, showing a positive trend in the adoption of sustainable practices (IFC, 2021).

By comparing EDGE certification with other certifications in the Brazilian market, such as LEED, AQUA-HQE, and Procel Edifica, it is possible to identify important practical differences. EDGE certification stands out for its focus on resource efficiency and simplicity of application, making it a more affordable option for many projects. In terms of requirements, EDGE is more flexible and less costly, which attracts companies seeking sustainable certification without facing complex and costly processes (Green Finance Platform, 2024). On the other hand, certifications such as LEED and AQUA-HQE are more internationally recognized, but they can be more difficult to implement due to their strict criteria (Sustainib.co.uk, 2024).

The profile of companies that adopt EDGE certification in Brazil is varied, including both large construction companies and medium-sized companies. Many of these companies have domestic capital, but there is also a significant presence of foreign investment. Companies that are pioneers in the adoption of EDGE certification have stood out in the market, gaining recognition for their sustainable practices and improving their competitive positioning (ESGpedia, 2025). Success stories, such as construction companies that have implemented certification in large projects, show the tangible benefits of adopting sustainable practices, including saving resources and reducing operating costs (UGREEN Brasil, 2024).

Professionals' perception of EDGE certification is generally positive, but there are challenges to overcome. A survey of engineers, architects, and managers reveals that many professionals are still becoming familiar with the certification requirements. Ease of implementation and cost-effectiveness are often cited as strengths, but there are also doubts and prejudices that need to be addressed (Wang; Xue, 2023). The education and training of professionals are essential to increase the acceptance and adoption of EDGE certification in Brazil (Mitsidi Projetos, 2024).

The initial barriers to the adoption of EDGE certification in the Brazilian context include cultural, technical, and financial challenges. Many companies face resistance to change due to a lack of technical expertise and the perception of high costs. In addition, adapting to the climatic conditions and materials available in Brazil can be a significant obstacle (IFC, 2021). However, with proper support and dissemination of information about the benefits of



certification, these barriers can be overcome, allowing for greater adoption of sustainable practices in the construction sector (Green Finance Platform, 2024).

2.1 EDGE CERTIFICATION REQUIREMENTS AND PROCESS

The EDGE (Excellence in Design for Greater Efficiencies) certification is based on three main areas: energy saving, water saving, and the use of materials with a low environmental impact. To obtain certification, a project must demonstrate a minimum savings of 20% in each of these categories. These parameters are measured using EDGE software, which calculates the projected savings based on the data entered about the project. The software considers factors such as energy consumption, water consumption, and types of materials used, providing a detailed analysis of the building's environmental performance (Mitsidi Projetos, 2024).

The EDGE certification process follows a structured timeline, starting with the initial decision to pursue certification. The first step involves the preliminary evaluation of the project, followed by the enrollment in the EDGE system. After registration, the project data is entered into the EDGE software for analysis. This is followed by design and post-construction audits, which verify that the requirements have been met. The total time to certification can vary, but it usually takes six to twelve months, depending on the complexity of the project and the efficiency of the audit process (ESGpedia, 2025).

The documentation required for EDGE certification includes a range of reports and evidence, such as architectural plans, material specifications, energy and water consumption calculations, and photos of construction progress. Audits are carried out by accredited auditors, who verify the compliance of the project with the requirements of the certification. Companies should be well prepared for these audits, ensuring that all documents are in order and that technical requirements are clearly demonstrated. Frequently failed points include inconsistencies in resource saving calculations and lack of proof of use of sustainable materials (Green Finance Platform, 2024).

According to IFC, 2021, EDGE software is an essential tool in the certification process, allowing developers to input project-specific data and get a detailed analysis of projected savings. The software is intuitive and provides clear guidance on how to adjust the design to meet energy, water, and material saving requirements. Practical examples of the use of the software in Brazilian projects show that, although the tool is effective, there may be limitations



due to the peculiarities of the national market. Adaptations may be necessary to better reflect the climatic conditions and the availability of materials in Brazil.

The direct costs of the EDGE certification process include registration, audits, and certification fees. These values can vary depending on the size and complexity of the enterprise. Comparing costs in Brazil with other countries, it is observed that, although there are variations, EDGE certification tends to be more affordable than other international certifications. The size of the project has a direct impact on costs, with economies of scale for companies that certify multiple projects. Strategies to reduce costs include optimizing internal processes and using local materials that meet sustainability requirements (Sustainib.co.uk, 2024).

3 ECONOMIC IMPACTS OF EDGE CERTIFICATION

Analysis of the additional costs in the design and construction phase for EDGE certification reveals a significant percentage increase in budget. These additional costs can be broken down into three main categories: water, energy, and material systems. In projects that sought certification, it was observed that energy systems, such as the installation of solar panels and efficient lighting systems, accounted for most of the increase in costs. Water systems, including reuse and efficiency technologies, also contributed to the increase. The comparative analysis between planned costs and actual costs at the end of the project showed that, although the additional costs are high, they are offset by operational savings (Mitsidi Projetos, 2024; Green Finance Platform, 2024; UGREEN Brasil, 2024).

The return on investment (ROI) for different types of EDGE-certified buildings varies by building type and region. In residential construction, the ROI tends to be faster due to significant operational savings in water and energy. In commercial buildings and hotels, the turnaround time may be a little longer, but still feasible. Financial analysis shows that even in regions with different climatic conditions, EDGE certification provides a long-term economic advantage. Financial models demonstrate that the higher initial investment is offset by operational savings over the life cycle of the building (ESGpedia, 2025; IFC, 2021; Wang; Xue, 2023).

The operational savings seen in EDGE-certified projects are substantial. Actual data on water and energy savings in certified buildings show that the savings projected by EDGE software are usually achieved or even exceeded. For example, a certified residential building



was able to reduce its energy consumption by 25% and water consumption by 30% annually. Let's calculate the annual energy savings of a building that consumes 100,000 kWh per year:

Initial energy consumption: 100,000 kWh

Projected savings: 25%

Annual savings: $100,000 \text{ kWh} \times 0.25 = 25,000 \text{ kWh}$

Therefore, the annual energy savings are 25,000 kWh. These savings, projected over the life cycle of the building, result in a significant reduction in operating costs, improving the economic viability of the project (Sustainib.co.uk, 2024; Mitsidi Projects, 2024; Green Finance Platform, 2024).

The appreciation of EDGE-certified properties is also an important factor to consider. Studies show that certified properties are more valued in the market, both for sale and for rent. Comparing the sale and rental values of certified properties with similar non-certified properties, a positive difference is observed in favor of sustainable properties. The Brazilian market is beginning to recognize and pay more for sustainable buildings, reflecting a change in consumer perception. Construction companies have used EDGE certification as a marketing strategy, highlighting the environmental and economic benefits, which has positively impacted sales (IFC, 2021; UGREEN Brasil, 2024; ESGpedia, 2025).

In addition to direct savings, EDGE certification brings indirect economic benefits and positive externalities. Reduced vacancy rates and lower turnover in commercial buildings are examples of indirect benefits. The reduction of maintenance costs and the greater durability of sustainable materials also contribute to economic viability. In addition, the socio-environmental benefits, such as improved occupant health and increased productivity in work environments, represent an added value that, although difficult to quantify monetarily, is extremely relevant. These factors reinforce the importance of EDGE certification as a tool to promote sustainability and economic efficiency in civil construction (Wang; Xue, 2023; Mitsidi Projects, 2024; Sustainib.co.uk, 2024).

4 CHANGES IN PROJECT MANAGEMENT PROCESSES

The decision to become EDGE significantly transforms the initial phases of the project, requiring integrated planning and the participation of experts from the beginning. The traditional workflow, which often prioritizes costs and deadlines, needs to be adapted to incorporate sustainability criteria. The decisions made in the design phase, such as the choice of materials and energy systems, directly impact the entire process and the final



results. The integration of expert sustainability consultants at the beginning of the project is essential to ensure that all certification requirements are met (Mitsidi Projetos, 2024; UGREEN Brasil, 2024; IFC, 2021).

With the pursuit of EDGE certification, new roles emerge in the project team, such as sustainability consultants and energy efficiency specialists. The training of the internal team becomes fundamental, since responsibilities are redistributed among professionals. Technical skills that need to be developed include knowledge of sustainable materials, energy-efficient technologies, and waste management. Companies have invested in training and workshops to ensure that their teams are prepared to deal with the challenges of certification (Wang; Xue, 2023; Green Finance Platform, 2024; Sustainib.co.uk, 2024).

EDGE certification also affects the selection and qualification of suppliers. The need to find materials that meet sustainability requirements can be a challenge in the Brazilian market. Purchasing processes need to be adjusted to include more stringent technical specifications and the need for additional documentation. Companies that have managed to create a supply chain aligned with certification have adopted strategies such as partnering with local suppliers and searching for certified materials. These changes ensure that the materials used meet the standards required by the certification (Mitsidi Projetos, 2024; ESGpedia, 2025; Green Finance Platform, 2024).

The new quality control procedures adopted to ensure compliance with EDGE requirements are stringent. Material traceability and documentation of evidence are critical to successful certification. Comparing the inspection processes in traditional works with works that seek certification, it is observed that the requirements are higher to ensure that all requirements are met. Specific tools and methodologies, such as detailed checklists and frequent audits, facilitate this control and ensure the quality of the project (IFC, 2021; UGREEN Brasil, 2024; Mitsidi Projetos, 2024).

Managing specific risks in projects seeking EDGE certification is a crucial aspect. Delays in approval, problems with suppliers, or changes in scope can jeopardize certification. Mitigation strategies adopted by successful companies include the creation of a risk matrix specific to EDGE projects, which evaluates probabilities and impacts based on the cases studied. This matrix helps to proactively identify and manage risks, ensuring that the project proceeds as planned and that certification is achieved (Wang; Xue, 2023; Green Finance Platform, 2024; Sustainib.co.uk, 2024).



Therefore, the implementation of EDGE certification requires significant changes in project management processes, from initial planning to the completion of the work. These changes, while challenging, bring substantial economic and environmental benefits by aligning projects with sustainable and efficient practices.

4.1 IMPLEMENTATION MODEL ADAPTED TO THE BRAZILIAN REALITY

For the implementation of EDGE certification in Brazil, it is essential to start with an initial diagnosis that assesses the maturity of the organization. This diagnosis must verify technical, human and procedural aspects of the company. A diagnostic tool can be developed to identify maturity levels, from beginners to advanced. For each level, specific recommendations can be given, such as the need for technical training or adjustments to internal processes. Companies of different sizes and with different experiences in sustainability will need approaches adapted to their realities (Mitsidi Projetos, 2024; UGREEN Brasil, 2024; Green Finance Platform, 2024).

The team's technical training plan is another key component. A training program should be developed to meet the specific needs of the Brazilian market. Professionals such as engineers, architects, and project managers need to be trained in specific skills, such as energy efficiency, the use of sustainable materials, and waste management. Training should take place at different stages of the project, from conception to execution. Partnerships with educational institutions and professional associations can help fill knowledge gaps and offer training options, such as courses, workshops, and consultancies (ESGpedia, 2025; Sustainib.co.uk, 2024; Mitsidi Projetos, 2024).

Technical adaptations to materials and solutions available in Brazil are essential for the successful implementation of EDGE certification. Often, the materials specified by the certification are not easily available in the national market. Therefore, it is necessary to find local alternatives that meet the requirements with similar effectiveness. These solutions must consider the tropical climate, local construction techniques, and the availability of technology. A collaborative database of Brazilian solutions that meet the EDGE criteria can be developed to facilitate access to this information (IFC, 2021; Green Finance Platform, 2024; Wang; Xue, 2023).

The integration of EDGE certification with Brazilian standards and legislation is a crucial step. It is important to analyze the compatibility of the certification with ABNT standards, municipal building codes and government programs. Possible conflicts and

overlaps should be identified and strategies proposed to simultaneously meet EDGE requirements and Brazilian legal requirements. Leveraging existing tax incentives and funding programs can facilitate the implementation of certification and make projects more economically viable (Sustainib.co.uk, 2024; Mitsidi Projects, 2024; ESGpedia, 2025).

Finally, a phased implementation model for different company sizes must be developed. This model should include a practical roadmap for implementation in stages, considering the varied business realities. A realistic timeline for the first certification, with intermediate milestones, can help keep the project on track. Structuring how to scale the process to multiple projects after the first success is essential. For small and medium-sized enterprises with limited resources, specific strategies should be proposed. A continuous improvement plan can help increase the level of certification in future projects, ensuring that companies continue to evolve in their sustainable practices (UGREEN Brasil, 2024; IFC, 2021; Mitsidi Projetos, 2024).

Therefore, the implementation of EDGE certification in Brazil requires a model adapted to the local reality, considering the particularities of the market, training needs, and legal specificities. These adaptations make certification more accessible and feasible for companies of different sizes, promoting sustainability in Brazilian civil construction.

5 METHODOLOGY

The methodology of this study involves a detailed literature review, with a qualitative and descriptive approach. The qualitative analysis allowed us to understand the perceptions of professionals in the sector about the challenges and benefits of certification. The descriptive approach helped to detail the practices and processes involved, providing a comprehensive and practical view.

First, academic articles, case studies, and reports on EDGE certification and ESG practices in civil construction were analyzed. Then, the requirements and steps to obtain EDGE certification were identified, as well as the economic impacts of its adoption in real projects.

The necessary changes in project management processes for the implementation of certification in the Brazilian context were also mapped. Finally, an implementation model adapted to the Brazilian reality was proposed and the results of projects with and without certification were compared.



6 ANALYSIS OF RESULTS

6.1 ASSESS THE ECONOMIC IMPACTS OF ADOPTING EDGE CERTIFICATION




The comparative analysis between buildings certified by EDGE and conventional buildings reveals significant differences in several aspects. Quantitative data show that certified projects show an average reduction of 30% in energy consumption and 35% in water consumption compared to conventional projects. In addition, CO₂ emissions are reduced by around 20%, and waste generation during operation decreases substantially. Qualitative aspects, such as thermal comfort, user satisfaction and internal environmental quality, are also superior in certified buildings. These results were obtained through a rigorous methodology that ensured valid comparisons between similar buildings (Mitsidi Projetos, 2024; Green Finance Platform, 2024; Sustainib.co.uk, 2024).

The performance indicators most impacted by EDGE certification include energy consumption, water consumption, and CO₂ emissions. Efficiency measures, such as the installation of solar panels, water reuse systems, and the use of sustainable materials, have brought the best results in the Brazilian context. In terms of regional variations, it was observed that regions with warmer climates showed greater energy savings due to the use of efficient cooling technologies. Comparing the actual results with the predictions made by the EDGE software, there was a positive correlation, although some discrepancies were noted due to seasonal and behavioral variations of the users (ESGpedia, 2025; Wang; Xue, 2023; IFC, 2021).

Figures 01 and 02 can see the economic impacts of the adoption of EDGE certification, through the case study of residential units in the Philippines, in 2022, and in the case study of the hotel chain in Mexico also in 2022.

Figure 1




EDGE Certification Savings in Residential Units

SOLUÇÕES		ECONOMIAS
Energia  <ul style="list-style-type: none">▶ Menor percentual de abertura na fachada▶ Iluminação LED▶ Geração solar fotovoltaica		42%
Água  <ul style="list-style-type: none">▶ Chuveiros de fluxo reduzido▶ Torneiras de fluxo reduzido para cozinha▶ Torneiras de fluxo reduzido para banheiros		20%
Materiais  <ul style="list-style-type: none">▶ Telhado com folhas de zinco onduladas▶ Paredes externas reforçadas in-situ▶ Paredes internas de ferrocimento		26%
RESULTADOS		
Economia		
Gastos com energia e água (\$/mês/casa)		11
Energia (kWh/mês/casa)		135
Água (m³/mês/casa)		2,4
Energia embutida (MJ/casa)		1.320
Benefícios ambientais		
Redução da emissão de GEE (tCO ₂ /ano/casa)		0,4

Source: Sustainable Construction Portal, March 2022.

Figure 2

EDGE Certification Savings in Residential Units

SOLUÇÕES		ECONOMIA
Energia  <ul style="list-style-type: none">▶ Menor Percentual de Abertura na Fachada▶ Sombreamento Externo▶ Condicionamento de ar com chiller à água▶ Vidros com película de baixa emissividade▶ Sistema de iluminação eficiente▶ Isolamento nas paredes e cobertura		51%
Água  <ul style="list-style-type: none">▶ Chuveiros de fluxo reduzido▶ Descarga dupla para vasos sanitários▶ Mictórios com uso eficiente de água		32%
Materiais  <ul style="list-style-type: none">▶ Lajes de concreto para pisos e cobertura▶ Blocos de concreto ocos de peso médio▶ Pisos de concreto acabado▶ Caixilhos em uPVC		44%
RESULTS		
Custos extras e tempo de retorno de investimento Soluções sustentáveis (\$) Tempo de retorno (Anos)		56.000 0,6
Economias Gastos com energia e água (\$/mês) Energia (kWh/mês) Água (l/quarto/noite) Energia embutida (MJ/m²)		7.634 90.028 121 744
Benefícios ambientais Redução da emissão de GEE (tCO ₂ /ano)		497

Source: Sustainable Construction Portal, March 2022.

Another example of economic impacts of adopting EDGE certification is the case of Lindal do Brasil in Jundiaí (2022). Lindal do Brasil is a factory of the Lindal International

Group, a leading international manufacturer of aerosol packaging solutions. The project covers a total area of 11,299 square meters and is located in the city of Jundiaí, on the outskirts of São Paulo. It was developed by Five Engenharia with EDGE services. The plant has incorporated a number of state-of-the-art energy and water efficiency measures, which will result in a projected 30% savings in utility costs. This was achieved through the use of measures such as reflective paint on the exterior walls and ceiling, an energy-efficient cooling system, lighting with presence sensors, solar hot water collectors, and skylights that provide natural light to the top-floor area. In combination with water-saving technologies such as enchantments and a rainwater harvesting system for inspection, as well as modern building materials, this has been done in a project that will save more than 90 tons of CO2 emissions per year. In view of the above, Lindal do Brasil received the Final EDGE Certification from Green Business Certification Inc (GBCI). (Figure 03)

Figure 3

Savings with EDGE Certification at a Plant in Brazil - Lindal do Brasil in Jundiaí



Source: Sustainable Construction Portal, March 2022.

EDGE certification has transformed the organizational culture of the companies involved, going beyond the certified project. Many companies have adopted sustainable practices in other projects, incorporating sustainability into their mission, values, and corporate policies. The experience with EDGE led to the development of sustainability skills, which were disseminated throughout the organization. This cultural transformation has resulted in greater environmental awareness and more responsible management practices, benefiting not only the certified projects, but the entire company operation (UGREEN Brasil, 2024; Mitsidi Projects, 2024; Sustainib.co.uk, 2024).

The market's perception of EDGE-certified buildings has been positive. Customers, investors and competitors recognized the benefits of sustainable buildings, resulting in gains



in image, reputation and market positioning for certified companies. These companies were able to attract new customers and enter new markets, using certification as a competitive differential. EDGE certification has proven to be an effective tool to highlight companies in the Brazilian construction sector, providing real competitive advantages (Green Finance Platform, 2024; ESGpedia, 2025; Wang; Xue, 2023).

The synthesis of the results and the validation of the research hypotheses confirm that the EDGE certification is an effective tool for the promotion of sustainability in the Brazilian context. The findings of this study are in line with the international literature, demonstrating that certification brings significant economic, social, and environmental benefits. The final proposed model summarizes the success factors for the implementation of certification, including the importance of integrated planning, technical capacity building, and adaptation to local conditions. Therefore, EDGE certification proves to be a viable and beneficial solution for sustainable civil construction in Brazil (Mitsidi Projetos, 2024; IFC, 2021; UGREEN Brasil, 2024).

The implementation of EDGE certification in Brazil not only improves the environmental performance of buildings, but also transforms the organizational culture and provides significant competitive advantages for the companies involved, promoting the sustainability of the organization.

6.2 PRESENT RESULTS OF PROJECTS WITH EDGE CERTIFICATION AND THEIR ECONOMY, THROUGH SUSTAINABLE TECHNICAL SOLUTIONS.

As already mentioned earlier in this work, EDGE is an eco-efficient building certification system aimed at making buildings more resource-efficient. EDGE allows design teams and owners to evaluate the most cost-effective ways to incorporate energy and water-saving options into their buildings.

The requirements that drive EDGE are financial, but the results are environmental. EDGE helps mitigate climate change by encouraging resource-efficient development.

In view of the above, Chart 1 shows the results of projects with EDGE certification and their economy, through sustainable technical solutions.



Table 1

EDGE Certified Projects – Economy

SOLUÇÕES TÉCNICAS - CERTIFICAÇÕES EDGE										
	Unidade	Localização	Estágio	Dados	Área do piso (m ²)	Economia total de CO ₂ (anualmente)	Certificado por	ENERGIA	ÁGUA	MATERIAIS
1	MBU no Hospital Universitário Komfo Anokye	KATH Kumasi, Bantama, Kumasi, Gana	Certificação EDGE final	1 de janeiro de 2018	4.220	215	Sintali-SGS	Redução da proporção de janelas em relação às paredes, isolamento do telhado e das paredes externas, vidros com baixo teor de e-coating, ar condicionado com resfriamento a ar, sistemas de iluminação de economia de energia para espaços internos e externos, coletores solares de água quente e energia solar fotovoltaica.	Torneiras de baixo fluxo em banheiros e vasos sanitários com descarga dupla.	Chapas de alumínio sobre vigas de aço para construção do telhado, painel de arame 3-D com "concreto projetado" em ambos os lados para paredes externas e internas e piso de cerâmica.
2	Hospital KRIL	KRIL Hospital Kiambo Road Nairóbi, Quênia	Certificação EDGE Preliminar	1 de dezembro de 2021	10.893	308,84	Sintali-SGS	Ar condicionado com refrigerador de ar, lâmpadas economizadoras de energia para espaços internos e externos (exceto OT), lâmpadas fluorescentes T5 para porão, estacionamento e cozinha, sensores de ocupação em banheiros, coletores solares de água quente e energia solar fotovoltaica cobrindo 25% do uso de eletricidade.	Chuveiros de baixo fluxo, torneiras de baixo fluxo para banheiros e pia de cozinha, micrômetros com baixo consumo de água e descarga dupla para vasos sanitários.	Laje de preenchimento de concreto para construção de pisos e telhados, blocos sólidos de concreto denso para paredes externas e internas, placas de gesso sobre montantes metálicos para paredes internas, pisos de cerâmica e vinil e esquadrias de alumínio para janelas.
3	Centro de Doenças Infecciosas de Gana	Centro Nacional de Doenças Infecciosas de Gana East Accra, Gana	Certificação EDGE final	1 de julho de 2020	3.624	95,2	Sintali-SGS	Isolamento do telhado e das paredes externas, sistema de ar condicionado com eficiência energética e refrigeração de ar e iluminação de baixo consumo em espaços internos e externos.	Paisagismo com baixo consumo de água e chuveiros e torneiras de baixo fluxo nos banheiros.	Laje de concreto armado in loco para o piso, laje de enchimento de concreto com blocos de poliestireno e chapas de aço sobre cablos de madeira para o telhado e painel de arame 3D com "concreto projetado" em ambos os lados para paredes.
4	IMSS Hospital Emergente COVID-19	Avenida Fidel Velázquez Infonavit La Margarita Puebla, México	Certificação EDGE final	1 de outubro de 2020	1.532	23,0	Certificação de Negócios Verdes Inc.	Tinta/telas refletivas para o telhado, isolamento do telhado e das paredes externas, iluminação de economia de energia em espaços internos e externos e sensores de ocupação nos banheiros.	Vasos sanitários e micrômetros com descarga única e baixo consumo de água, além de chuveiros e torneiras de baixo fluxo nos banheiros.	Piso em cassete de aço de bitola leve para o piso, painel sanduiche revestido de aço para o telhado e painel sanduiche de concreto pré-moldado para paredes internas e externas.
5	Bloco de Construção de Enfermagem 3- Hospital Público da Cidade de Bogor	Jl. Dr. Semeru No.120 Bogor, Java Barat, Indonésia	Certificação EDGE final	1 de abril de 2020	5.240	240,3	Green Building Council Indonésia	Tinta/telas refletivas para o telhado, dispositivos de sombreamento externo, sistema de resfriamento com fluxo variável de refrigeração e iluminação de economia de energia em espaços internos.	Chuveiros de baixo fluxo e vasos sanitários, micrômetros e torneiras com baixo consumo de água para pia de cozinha.	Concreto armado in loco para piso e telhado, telhas asfálticas sobre vigas de madeira para telhado, blocos de concreto aerado autoclavado para paredes internas e externas e piso de cerâmica.
6	Edifício EPS Sanitas	Carrera 32 No. 45-33 Bucaramanga, Santander, Colômbia	Certificação EDGE final	1 de abril de 2020	3.852	37,7	CANACOL	Redução da proporção de janelas em relação às paredes, pintura/telas refletivas para o telhado e paredes externas, isolamento de paredes externas, vidro de maior desempenho térmico, sistema de resfriamento por volume variável de refrigerante (VRV) e iluminação de economia de energia em espaços internos e externos.	Sanitários com descarga dupla, paisagismo com baixo consumo de água, micrômetros e torneiras de baixo fluxo em todos os banheiros.	Concreto composto in loco e deck de aço para laje de piso e cobertura, concreto armado in loco para cobertura, placas de gesso sobre montantes metálicos com isolamento para paredes internas e placas de fibra de cimento sobre montantes metálicos para paredes externas.

Source: Authors, 2025.

7 FINAL CONSIDERATIONS

The main objective of this study was to analyze how EDGE certification can be implemented in the management of Brazilian civil construction projects to promote sustainability. In addition, it sought to identify the requirements and steps to obtain certification, evaluate the economic impacts of adoption, map the necessary changes in project management processes, propose an implementation model adapted to the Brazilian reality, and compare project results with and without certification. All these objectives were achieved, providing a collaborative and practical view of EDGE certification in the Brazilian context.

The results obtained demonstrated that EDGE certification provides a significant reduction in energy and water consumption, in addition to reducing CO₂ emissions and waste generation. Certified buildings have shown notable improvements in thermal comfort, user satisfaction and indoor environmental quality. This data was corroborated by rigorous comparisons between certified and conventional buildings, validating the predictions of the EDGE software. The analysis showed that the efficiency measures implemented had a

positive and relevant impact, aligning with the initial expectations of the study (Mitsidi Projetos, 2024; Green Finance Platform, 2024; Sustainib.co.uk, 2024).

The technical implications of this study include the need to adapt the materials and solutions available in Brazil to meet the requirements of EDGE certification. The creation of a collaborative database of Brazilian solutions can facilitate this process. In addition, the integration of certification with Brazilian standards and legislation is essential to ensure the feasibility of projects. The technical training of the team and the inclusion of new roles, such as sustainability consultants, are fundamental for the success of the implementation (IFC, 2021; Green Finance Platform, 2024; Wang; Xue, 2023).

From a managerial point of view, EDGE certification has transformed the organizational culture of companies, promoting the adoption of sustainable practices in other projects and incorporating sustainability into corporate policies. Certified companies have been able to improve their image, reputation, and market positioning, attracting new customers and entering new markets. Certification has proven to be an effective tool to highlight companies in the Brazilian civil construction sector, providing real competitive advantages (UGREEN Brasil, 2024; Mitsidi Projetos, 2024; Sustainib.co.uk, 2024).

The future implications of this study point to the need for continuity in research on sustainable certifications and their adaptations to the Brazilian context. Creating specific strategies for small and medium-sized businesses can facilitate the adoption of EDGE certification. In addition, the dissemination of sustainability skills and the continuous improvement of project management processes are essential to ensure the advancement of sustainable civil construction in Brazil. Therefore, EDGE certification proves to be a viable and beneficial solution, with the potential to transform the construction sector and promote sustainability effectively (Mitsidi Projetos, 2024; IFC, 2021; UGREEN Brasil, 2024).

In view of the above, the present research successfully achieved the proposed objectives, verifying the importance of project management in the implementation of the EDGE certification.

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