A Work Project, presented as part of the requirements for the Award of a Master's degree in Management from the Nova School of Business and Economics.

The Potential of Sustainability as a Strategy for Sport Lisboa e Benfica: An Analysis of Green Building Implementation in Estádio da Luz

Pedro Maria Ferraz de Oliveira Silva Santos

Work project carried out under the supervision of:

Pedro Miguel Soares Brinca

18/12/2023

Group Part

Abstract

The present project aims to understand how organisations, especially sports organisations like SL Benfica, can benefit from sustainability. The starting point was understanding sustainability at a global level, in the corporate world, and within the sports industry. An analysis of Benfica and a characterisation of the UN's frameworks, S4CA and F4TG, followed. Then, the focus was to develop practical implementations aligned with the UN's SDGs that could drive the club's sustainability strategy in the future, never disregarding profitability. One of these implementations was the analysis of implementing LEED to the club's stadium, assessing the possible benefits and challenges.

Acknowledgements

My sincere appreciation goes to Professor Pedro Brinca for his guidance and support during the evolution of this thesis, which was pivotal in shaping our research trajectory. Gratitude is also extended to Sport Lisboa e Benfica, particularly Afonso Maya Seco and Matteo Signoretto, for their collaborative contributions and essential inputs. Last but not least, thank you to my colleagues with whom I had the pleasure to work alongside on this project, as well as to all my friends and family for motivating me throughout this journey.

Keywords: Sports Management; Sustainability; Strategy; Sport Lisboa e Benfica; United Nations

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 222)

Table of Contents

1. Introduction *6*
2. Methodology *7*
3. Literature review *8*
3.1 Sustainability and its Benefits **8**
3.2 Sustainability Today **11**
3.3 Sustainability Delay in Sports **13**
3.4 Sports Fans' Perception of Sustainability **15**
3.5 Examples of Successful Sustainability Practices **18**
4. Context *23*
4.1 Benfica – Organisation, Infrastructure, and Values **23**
4.2 United Nations Initiatives **24**
5. Analysis *28*
5.1 External Analysis **28**
5.1.1 Porter's 5 Forces: Sustainability 28
5.1.2 PESTEL 32
5.2 Internal Analysis **36**
5.2.1 VRIO Framework 36
5.2.2 SWOT Analysis 38
6. An Analysis of LEED Implementation in Estádio da Luz *42*
7. Discussion *57*
8. Conclusions and Recommendations *68*
9. Bibliography *7070*

Abbreviations

CO_2: Carbon Dioxide

AELTC: All England Lawn Tennis & Croquet

BDC: Business Development Bank of Canada

BREEAM: Building Research Establishment Environmental Assessment Method

CEAN: Centro Educativo Alice Nabeiro

CEO: Chief Executive Officer

CL: Champions League

CSDD: Corporate Sustainability Due Diligence

DCF: Discounted Cash Flow

EPAL: *Empresa Portuguesa das Águas Livres*

ESG: Environmental, Social and Governance

EU: European Union

F1: Formula 1

F4TG: Football for the Goals

FGR: Forest Green Rovers

FIA: Federation Internationale de L'automobile

FIFA: Federation Internationale de Football Association

FTE: Full-time Equivalent

GHG: Greenhouse Gas

IT: Information Technologies

LEED: Leadership in Energy and Environmental Design

ML: Machine Learning

MLS: Major League Soccer

NABERS: National Australian Built Environment Rating System

NBA: National Basketball Association

NFL: National Football League

NPV: Net Present Value

PA: Pennsylvania

S4CA: Sports for Climate Action

SDGs: Sustainable Development Goals

SLB: Sport Lisboa e Benfica

SPs: Sustainable practices

TMO: Television Match Official

UEFA: Union of European Football Associations

UN: United Nations

USA: United States of America

USGBC: United States Green Building Council

VAR: Video-Assisted Referee

WGBC: World Green Building Council

1. Introduction

Since oil was discovered in Titusville, PA, in 1859, and the first gasoline-powered internal combustion engine was invented in 1861 by German engineer Nikolaus Otto, the boundaries of industrial possibility changed forever. Modern industrialism ideas came to be in a world far different from the one we know today, characterised by low demographics and abundant resources. Scarcity was not an issue; everything revolved around productivity, with little regard for waste management and social consequences. This was not a viable long-term strategy to conduct business, as waste started accumulating on the surface in the form of plastic and other harmful residues and the atmosphere with CO_2 emissions. Unsustainable business models can deplete resources, increase their respective prices, and spread harmful practices on a massive scale. Hence, the only way to decrease an entity's environmental footprint is by adequately managing resource consumption and investing in meaningful SPs (Nulli Rinalducci 2023). Businesses also play a pivotal part as role models in society, given that a brand carries the power to influence society on a massive scale. With the capacity to cause an ever-lasting impact on citizens - the company's customers and driving force - it is in an enterprise's best interest to ensure its healthy environment. Because of this, businesses are responsible for connecting with the communities they serve, contributing to overall social welfare (Chladek 2019). That is where sustainability comes into play, emerging as a response to the growing global awareness of the environmental and social issues affecting our planet. Therefore, this study aims to comprehend how sustainability can positively impact SL Benfica's operations, helping the organisation build a more sustainable business model that includes today's concern of making the world a better place for current and future generations. This objective was pursued by understanding the benefits of introducing sustainability in a company, aligning closer to the reality of the UN's SDGs, and proposing actual implementations that may significantly impact the club's stakeholders.

2. Methodology

The present project was realised with four guiding objectives, each adopting suitable methods to reach different conclusions. The first objective, to highlight the possible benefits organisations may gain by pursuing sustainability and apply this to SL Benfica's context, mostly resorted to a qualitative analysis of secondary data. To understand whether sustainability is valuable to organisations, the concept was first thoroughly defined from various perspectives. Furthermore, thorough analyses of the industry and club in question were performed, employing known frameworks sustained in the vast literature available.

The second objective was to understand where SL Benfica stands among its peers regarding sustainability initiatives and grasp sports fans' opinions on who the Portuguese sports organisation with the most SPs is and what factors may influence these opinions. For this, a mixture of qualitative and quantitative analysis of the main SPs of the three biggest Portuguese sports clubs was performed. In addition, to detect factors that may prove significant in shaping the probability that individuals believe SL Benfica is the Portuguese club with the most implemented SPs, a survey was conducted and later analysed through a logistic regression using IBM's SPSS Statistics.

Thirdly, this project's goal was also to provide an in-depth analysis of the UN's current initiatives and organisations regarding sports sustainability and highlight the benefits of adopting them for SL Benfica. This was performed through the qualitative study of secondary data.

The last objective was to provide sustainability initiatives that may fit SL Benfica's organisational boundaries. Of course, the initiatives' financial, environmental, and social viabilities were analysed through secondary data, and assumptions were made when no data was available. These assumptions were clearly stated and were avoided whenever possible.

3. Literature review

3.1 Sustainability and its Benefits

Sustainability has become a fundamental concern for organisations. According to a recent IBM study, 51% of respondents from the world's ten largest economies believe that environmental sustainability is more essential today than a year ago (Cheung et al. 2022). Not only that but as stated in the United Nations Global Compact-Accenture CEO Study on Sustainability, 77% CEOs polled in the developing world believed they should lead efforts and speak about global priority issues (Sweet 2023).

Hedstrom (2018) suggests that a sustainable firm aligns its governance, strategy, and innate necessity for profitability with two main concerns: environmental stewardship and social responsibility. On the other hand, Bateh et al. (2013) define sustainability as an organisation's capacity to uphold its fundamental goals and values across time while satisfying the demands of present and future generations. That being said, literature has only recently started to fully consider the broad impacts that actions perceived as sustainable may bear on the planet's ecosystems, and even though one might perceive them as being positive for the environment, they may spell unintended effects. For example, Crowther and Seifi (2020) state that even though hydroelectricity has been regarded as a source of sustainable and renewable energy for years, only recently has there been extensive research on the impact hydroelectric dams have on river deltas and the wildlife dependent on them. Of course, this does not mean hydroelectric dams should not be constructed; it just means the broader effects of their construction should be considered when choosing their future locations.

Another notion of sustainability is given by Aras and Crowther (2012), who emphasise it as a survival mechanism for any organisation. The authors remark that sustainability within the corporate world must begin with the assumption that organisations are inserted within a broader social and economic environment. As such, this environment must be maintained if the

organisation aims to become successful in the long term, and the risk management nature of sustainable measures makes them ideal for this purpose (Rafi 2022). Addressing climate change, for instance, might reduce financial risks associated with catastrophic weather occurrences and resource scarcity while preparing companies for potential environmental hazards not considered initially. In simple terms, for a company to survive, the environment it is inserted in must also survive. This way, sustainability becomes business executives' way of protecting their organisations' financial prospects by ensuring the well-being of their social and environmental setting.

Besides survival, what does sustainability bring to the table? After all, it is not viable for corporations to purposely harm themselves in pursuit of sustainability. For some, the term is even considered a synonym for "compromise": an enterprise must compromise on performance to "care for the world". This idea could not be further from the truth. For corporations, sustainability should be a moral duty and a strategic necessity. Robert Sroufe (2018) explores whether pursuing sustainability goals proves to be a hindrance to business development and profitability. The author concludes that if implemented correctly, sustainability creates value for enterprises. It is implied that SPs are no longer optional, as sustainability opens a vast new competition spectrum for organisations that need to cut costs, discover new market prospects, improve operating efficiency, decrease waste, and streamline processes. According to Nidumolu, Prahalad, and Rangaswami (2014), sustainability is a critical driver in fostering an innovation environment in any sector, and if enterprises want to remain innovative and resilient in increasingly interconnected and demanding markets, they must adapt.

Sustainability performance also demands robust risk management metric systems, improving businesses' overall control over their operations and showing responsible investors that the company is committed and transparent (Sroufe 2018). Investors desire partnerships with a viable long-term strategy, so companies with effective sustainability policies are more likely to

attract consumers, investors, and business partners (Chron 2017). According to Sroufe (2018), stakeholder engagement, risk management, and overall regulatory compliance are all pillars of sustainability management in the UN's SDGs. Still, they can also be sources of competitive advantage for companies in matters unrelated to sustainability *per se*, enhancing the organisation's capacity to adhere to regulatory requirements, particularly those about carbon emissions. The Deutsche Bank non-financial report states that firms with strong ESG ratings beat the market in the medium (5 years) and long term (5-10 years). A 2021 Morningstar analysis also indicated that firms with the highest ESG scores returned 33.3% more revenue over one year, outperforming the overall United States market by more than 8% (Solberg 2022). Accenture's report also provides an update on these findings, noting that firms with high ESG ratings had average operating profits that were 3.7x greater than those with poor ESG ratings. Such firms outperformed inferior ESG performance by 2.6 times (Accenture 2022).

Research also shows how closely related central business ideas like internalisation, competitive advantage, public policy, organisational strategy, and leadership are to sustainability (Kolk and Pinkse 2008). The positive impact of sustainability on economic and market-driven performance outcomes is one of its most persuasive features. Notably, an organisation's financial and market success is significantly influenced by the synergistic effects of both social and environmental performance (Bateh et al. 2013). This acknowledgement extends beyond moral or strategic issues to include the substantial influence on a business's reputation and brand (Berns et al. 2009). According to the same authors, when a company demonstrates leadership in sustainability, it can indicate higher management quality. In addition, companies that practice environmental responsibility behaviours not only lessen their environmental impact but also obtain a competitive edge, becoming more legitimate and securing long-term viability (Simmonds and Bhattacherjee 2012).

In this sense, Galpin, Whittington, and Bell (2015) emphasised that cultivating a culture focused on sustainability must be prioritised for organisations to succeed in their endeavours. This effort is necessary since sustainability measures help organisations reach long-term goals while reducing their environmental impact. On the other hand, reaching sustainable goals requires extensive collaboration. Per the findings of Lozano, Barreiro-Gen, and Zafar (2021), organisations can access more markets and information, maximise their financial and human capital, and streamline their operations, all by cooperating. A high enough degree of cooperation guarantees that advantages outweigh drawbacks. Finally, as Bartolacci, Caputo, and Soverchia (2019) stated, numerous studies have consistently demonstrated a positive link between companies' sustainable practices and financial performance. Indeed, firms may overcome obstacles and start a positive cycle of sustainability investment by monetising and making the most of the tangible and intangible benefits of sustainability efforts (Atz et al. 2020). This is crucial, as it is not worth it to be sustainable if the company is not maximising its benefits for doing so.

The picture is clear: sustainability generates corporate value and long-term success, mainly because a sustainable business is designed to last and is assembled around long-term initiatives that, in turn, lead to long-term results. Furthermore, internal systems and procedures become connected, resulting in an autonomous and resilient unit where the interdependence of the environmental, social, and economic systems surrounding the company is harnessed.

3.2 Sustainability Today

The UN's first significant attempts at pursuing a global sustainable change were known as the Millennium Development Goals, then aimed at ending poverty worldwide. These MDGs were first implemented in the year 2000. Even though they were not wholly achieved, they managed bold accomplishments throughout their lifespan, lifting over 1 billion people out of extreme

poverty and halving out-of-school children and child mortality rates worldwide (United Nations Development Programme 2023).

To continue this progress, the UN designed a set of 17 Sustainable Development Goals (Appendix 1) to be reached by 2030 at the United Nations Conference on Sustainable Development in Rio de Janeiro (2012) as "a shared blueprint for peace and prosperity for people and the planet, now and into the future" (United Nations 2023). Aimed at fighting climate change, poverty, and inequality on all fronts, these goals are intertwined, codependent, and span various societal problems, ultimately being agreed upon in September 2015. In December of the same year, global governments came together at COP21's Paris Climate Conference to establish new guidelines for development and growth worldwide and implement legally binding measures to fight climate change internationally and in all sectors of society. From this conference, the Paris Climate Agreement was born, and its main objective was to quicken efforts and investments in the direction of a low-carbon sustainable future, keeping the rise in global temperature to well under 2 degrees Celsius above pre-industrial levels (United Nations Climate Change 2018).

To better construct an efficient and valuable sustainable strategy, companies must understand the current state of the world's environmental and social challenges (Maryville University 2019). According to the UN's Global Sustainable Development Report 2023, at the halfway point to 2030, most of the progress has either been limited or non-existent. Additionally, in some cases, such as SDGs 2, 8, 12, 13, 14, and 15, relating to Hunger, Decent Work and Economic Growth, Responsible Consumption and Production, Climate Action, Life Below Water, and Life On Land, respectively, the progress shows downward trends (Miranda et al. 2023).

Nonetheless, not all hope is lost. Deloitte launched its *CxO Sustainability 2022* study, designed to analyse C-level executives' sustainability initiatives in 21 countries around the world for the

2022 calendar year, and even if the overall progress towards reaching the UN's SDGs is not promising, many CEOs seem to be taking sustainability measures seriously. Regarding business-related changes, the study shows that 67% of companies have started using more sustainable materials, 49% are developing new climate-friendly products or services, and 37% are tying senior leaders' compensation to environmental sustainability performance. Furthermore, when it comes to more efficient ways of conducting business, the study also suggests that 66% are working to improve their energy efficiency, 57% have started using climate-friendly and energy-efficient machinery, technologies, and equipment, and 55% are making efforts to cut down on air travel. Finally, concerning companies' partners and contributors, it is also mentioned that 57% of surveyed enterprises are providing employee training on climate change and climate action, 46% have begun requiring business partners to meet specific sustainability criteria, and 40% of companies have started incorporating climate considerations into lobbying and political decisions (Deloitte 2022). Additionally, 30% of Europe's largest companies have committed to reaching net zero by 2050 (Accenture 2021), and 90% of companies on the S&P 500 index published a corporate social responsibility report in 2019 compared to 20% in 2011 (Stobierski 2021), and 22.8% of Fortune 500 corporations have engaged with the UN's SDG framework. However, only 0.2% of these have developed methods and tools to assess and evaluate the progress of their actions toward relevant SDGs (Song et al. 2022).

3.3 Sustainability Delay in Sports

The United Nations refers to Climate Change as "the defining crisis of our time" (United Nations n.d.). While the focus of criticism may shine brighter on other industries, such as travel, quick fashion, or food, where does the sports industry fit in all this?

The sports industry has a crucial role to play in sustainability as a whole, predominantly because of its global appeal and substantial carbon footprint. According to FIFA, 0.2% of global CO2

emissions are generated by the football industry alone (ZipDo 2023), and if the entire sports industry is considered, the environmental impact will rise considerably. Although quantifying sports' precise ecological impact can be challenging, it is generally accepted that sports significantly contribute to climate change through travel, energy use, and construction, among other factors. Regarding fan travel and housing, these are estimated to account for more than 85% of the emissions of significant sporting events (Henczel 2021). Furthermore, the British Premier League also reported an increase of 22% in CO_2 emissions from football teams' travel over the last five years (ZipDo 2023). With a much higher carbon footprint ascribed to spectators and participants, it is apparent that sports have a distinct halo effect regarding climate change, which can also be harnessed as a tremendous force for change (STX Group 2023).

According to Van Halm (2022), the 2022 edition of the FIFA World Cup in Qatar was the most damaging international sporting event in the last 13 years. This event produced a reported 3.6 million tons of CO_2, which exceeded the previous three editions of the tournament and the last five Olympic games, and it might not even be a correct depiction of the actual situation. In a BBC article, Mike Berners-Lee, an English carbon footprint researcher and professor at Lancaster University, states that the actual carbon dioxide emissions value might be at least three times the reported (Lockwood and Warwick 2022).

This lag is also mentioned in a Global Sustainable Sports study, which states that "it is a widely held belief that sport has been slow to address social and environmental issues" (Global Sustainable Sport 2023). This belief is backed by Donovan (2020), who adds that, in the case of football, most teams only have a basic statement of intent, such as FIFA's: "We believe we all have a responsibility to protect, cherish and limit our impact on the environment". Henry Staelens, CEO of Forest Green Rovers, also accentuates this pro forma stance of the industry by saying: "In many cases, it still feels like a bit of a PR exercise when I see initiatives from various sports associations and teams – authenticity is the key to making sustainability work,

both short and long term. It has to be followed up daily." (Long 2022). The lack of commitment towards sustainability evident here is also corroborated in the study mentioned above by highlighting that only 0.1% of the sports industry participates in the UN's *Sports for Climate Action* initiative. Additionally, less than 1% of the sector is active in at least one of Global Sustainable Sport's "Sustainable Pillars" framework, showing how long sport must go. To combat climate change, the sports industry can lead by example and motivate sizeable audiences to act, thanks to the global appeal of this form of entertainment, which has billions of fans and extensive media coverage. It is not new that sports celebrities exert significant influence as trusted voices. Athletes such as Lewis Hamilton, Héctor Bellerin, Katy Rude, and Novak Djokovic have publicly declared themselves environmental advocates, spreading awareness on this topic. Norwegian professional footballer Morten Thorsby even created his own "We Play Green" initiative. This group emphasises that clubs and players are responsible for displaying green attitudes and practices as leaders of the football family's 3.5 billion members. Recently, the UK's national campaign, "The Green Football Weekend", was created, which brought together millions of football fans, more than 80 of the country's greatest football teams, charity partners, and sports broadcasters to harness the power of football to combat climate change.

3.4 Sports Fans' Perception of Sustainability

For many years, sports were solely regarded as a means of entertainment. However, it is now a multi-billion-euro industry with an immense effect on society and its behaviour, as we can see from the recent adoption of informal skateboarding as a competitive activity (Varmus et al. 2022). As the public becomes aware of climate change problems, the major sporting leagues and associations also acknowledge their accountability towards society on environmental impact, as Harrison, Vafeiadis, and Bober (2022) explained. Trendafilova et al. (2014) also stated that sustainability practices "have the potential to promote public commitment to

environmental protection", implying that businesses can and should promote public responsibility for environmental wellness. It is vital to evaluate what sports enthusiasts think about sustainability programs within the sports industry and how such programs affect sports fans' perspectives and opinions.

As anticipated, fans' influence on the sustainability efforts of the sports industry is considerable. McCullough (2020) noted that fans are open to these initiatives to alleviate the environmental impact when they attend sporting events. Integrating targeted environmental sustainability campaigns within sporting events successfully educates participants and encourages eco-friendly behaviours. Furthermore, studies indicate that such communication could foster fan trust in sports organisations and positively reconstruct their perception of the organisation's global impact (Harrison, Vafeiadis, and Bober 2022). This is even more significant considering the drive for sports to move forward towards the United Nations' SDGs. Sustainability programs may also be integrated into sports events to help develop stronger links with certain fans, regardless of age or political inclinations (McCullough 2020). Such results underscore the universal nature of sport and the opportunity to tap into the collective identity of supporters to change their behaviour.

From a different angle of this juncture, the total environmental effect of sports events most often lies in the hands of those who take part as fans; thus, convincing them to behave sustainably requires effort (McCullough and Kellision 2016). However, organisations should try to achieve an equilibrium between the loyalty of fans and the potential support for sustainability efforts. For instance, behaviours like saving water and energy or using public transportation can be fomented. Since many fans have strong sympathy and allegiance to a particular team, these institutions can capitalise on the close relationship and persuade them to act sustainably. Sports sponsorship could play a significant role in mobilising sustainability among fans, as it can support specific brands while encouraging corporate social responsibility.

This kind of adoption will influence customers' purchasing decisions, as granted by Melović et al. (2019). As a result, organisations may obtain positive results by investing through this advertising channel as they strive for sustainable development. This shows its potential to have an effect beyond the sports world and contribute significantly towards building lasting social change. There is more evidence of football supporters' growing interest in climate action programs run by their favourite teams. For instance, Pusey (2022) stated that a BBC Sport poll revealed that 58% of supporters "strongly agreed" that they were concerned about the environmental impact of their football team. Similarly, 80% of fans in Italy and Sweden who participated in an EU-funded survey agreed that their club's environmental initiatives would make it easier for them to act greener. In addition, according to a 2008 survey conducted by Pro Green Sports, 3/4 of fans think that green products are worth the extra money, and 90% value the environmental efforts made by professional sports teams (Blankenbuehler and Kunz 2014). Moreover, a sizeable portion (60%) of the professional sports teams' sample now prioritises sustainability initiatives. At the same time, professional sports organisations are now focusing on progressively adopting environmental policies as they become more aware of the opportunity to benefit from supporters and the public. While strategic and financial performances are essential for managers, building a relationship with fans through sustainability initiatives can help create a more attractive club identity which is just as important. That being the case, such initiatives may result in a more significant customer/fan base. On the other hand, sports institutions can interact with fans through online communities and use their influence to shape green fan behaviour, taking advantage of how involved fans are in sports. Blankenbuehler and Kunz (2014) argue that sports sites could retain visitors for longer, which shows the potential to reach consumers through online platforms, given that a sizeable portion of the population considers themselves sports fans.

3.5 Examples of Successful Sustainability Practices

In the 21st century, sustainability has become an essential aspect of business. In the face of social and environmental issues, the global community demands that companies be aware of their impact on the world and society. Numerous studies highlight why a business needs a sustainable strategy to thrive in any sector nowadays. However, it is essential to look at what companies are doing and shift from a theoretical view into a more empirical, hands-on approach, even when not in the sports industry.

A great example outside both the Portuguese and sports spectrum is Patagonia. The company is famous for using a marketing campaign slogan stating, "Don't buy too much from us." It seems surreal how this can be a successful marketing campaign, but it was, mainly due to the sustainable message it tried to convey. Patagonia's apparel line currently contains more than 70% recycled materials (The Brand Hooper 2023). However, the company is aware that the best approach to prevent waste is to avoid making unnecessary purchases in the first place, so since way back in 2011, Patagonia has sponsored advertisements urging people not to buy clothing they do not need, even its own: "We ask you to buy less and reflect before you spend a dime on this jacket or anything else", was one of the many commercials stated and additionally, offered a repair program that is frequently free and encourages repairing rather than purchasing when clothing starts to lose its lustre. They have managed to encourage customers to choose better items customised to the unique interests of end users because when the end user receives something they truly desire, they are more likely to retain it for a long time, preventing it from ending up in a landfill. All these actions managed to eliminate waste and boost favourable brand perception (Hansen and Chouinard 2023).

From another point of view, after an assessment of corporate reputation based on ESG factors by Merco, Portugal's most responsible company in 2022 was Grupo Nabeiro, famous for its brand Delta Cafés (Gaboleiro 2023). Sonae, the multinational business group, closely followed

it with a second position among the leading 100 companies. This key finding calls for a deeper investigation of these two national corporate major players beyond the sports realms and underscores their extraordinary achievements in the broader context of the country's business and societal growth. Grupo Nabeiro, with its flagship brand Delta Cafés, is committed to sustainability beyond the standard corporate responsibility. The business group reflects on the importance of sustainability in ensuring its long-term viability. As primary responsibilities, the group compromise is unveiled in sustaining profitability, minimising environmental damage, and maximising positive social impact (Delta Cafés n.d.). Also, its holistic approach to sustainability embraces eco-efficient production, empowering employees for change and community development. The company's product development cycle is based on the principles of eco-efficiency and eco-design, which include sustainability as a critical part of minimising inefficiencies and waste generation. In economic terms, Santos Dias (2023) revealed that Delta Cafés' strong emphasis on sustainability contributes significantly to its financial worth, adding up to 17.2% of Delta's financial value in Portugal, indicating how sustainable Delta Cafés' culture is. The CEO, Rui Miguel Nabeiro, has recently underscored the company's dynamic nature by referring to innovation as a crucial growth driver to focus on while still preserving its commitment to outreach a synergy between an economic growth model and a sustainability-oriented strategy (Macedo 2019) called *"Partilhamos o Futuro"* (We Share the Future) strategy. This framework is built on three pillars: community, people, and planet – in line with a sustainability policy regarding the UN SDGs (Grupo Nabeiro 2021b). Starting with the first pillar, the company focuses on conserving coffee culture origins, improving coffee-reliant populations' quality of life, and community involvement projects. Its association, *"Coração Delta"*, acts in this regard through educational projects such as CEAN. The company's proclivity for local and national suppliers and its active membership in the International Coffee Partners (Grupo Nabeiro 2021) demonstrates its commitment to propagating sustainability in

coffee-productive areas. The second cornerstone is investing in talent, providing personal growth through training, and protecting employees' well-being. In this field, the *"Coração Delta"* association takes a key role, carrying out volunteer actions and socially oriented projects. Finally, Grupo Nabeiro (2021a) acknowledged the grave reliance upon the circular economy through operational environmental activities, including using biodegradable coffee capsules and green energy. For instance, the company has reduced its environmental footprint by installing photovoltaic solar panels and streamlining processes to prevent waste. Regarding Sonae, sustainability is a corporate goal and a collective responsibility that unifies its range of businesses. Sonae's chairman, Paulo Azevedo, ensured the group is focused on generating profit sustainably and responsibly (Sonae 2023a). The fact that Sonae's firms rely on natural capital backs the organisation's priority of following global ambitions to make a positive impact. Paralleling Grupo Nabeiro's approach, Sonae's chairman's message was also a testament to their commitment to the UN SDGs and Global Compact initiatives, stating the importance of inclusivity and stakeholder engagement to deliver long-term value creation. Sonae (2023a) noted various achievements in 2022, including a fulfilled target of using 80% reusable, recyclable, or composted plastics packaging material, 24% fewer greenhouse gases compared to 2018, about 39% women-owned leadership positions, the financing of over 88,545 trees for reforestation and a contribution worth 31 million euros towards supporting communities. On the other hand, Sonae has articulated five major attention points in its sustainability strategy (Sonae 2023): fight against climate change and carbon neutrality within the company's operations; foster protection and regeneration of biodiversity and water; support management decisions with ESG requirements; search for new production/consumption models that may favour circularity actions; and focus at ensuring a diverse, inclusive environment as much as possible. Sonae also shows its commitment to human development by investing significantly in reskilling and upskilling its employees (Cardoso 2023). In fact, Sonae is a

sponsor of programs that deal with requalification for future employment, like the European program R4E-Reskilling for Employment.

Inside the sports industry and outside of football, we can already see a lot of sustainable actions that have been successfully implemented. Formula 1 is a sport that, at first glance, might seem one of the most hazardous sports for the environment. However, the fact is that they have tackled this issue early on and have the ambitious goal of zero carbon emissions by 2030 in the F1 championship. The teams, the organisation, and the racetracks are all involved in this strategy, and the French racetrack has already achieved a high level of FIA environmental certification because it captures rainwater, uses solar panels and 100% of the waste generated by the races and public is recycled (Normand 2022). Since 2019, when Formula 1 started investing in sustainability, it has become the fastest-growing sport in the world (Pompliano 2023) and achieved significant sponsorship growth, a growing television audience, record attendance, and, most notably, revenues have been increasing ever since the industry bet on sustainability (Brown 2023).

In the United States, the most prominent sport is undoubtedly American football, and the biggest league of this sport, the NFL, has already started tackling sustainability issues. They have created the "NFL Green" program, which aims to reduce the overall environmental impact of the league by creating partnerships with sponsors, clubs, and local associations. The program has already gained some traction among franchises; for example, the San Francisco 49ers stadium has solar panels, and 99% of the waste produced in the Philadelphia Eagles games is recycled (Trendafilova et al. 2014).

When analysing specifically the football industry and its trademark high carbon footprint, travelling, stadium operations, and garbage creation are the main contributors. In this industry, a particular football organisation is at the forefront of sustainability strategy: Forest Green Rovers Football Club. The club used a sustainability approach that set it apart from other

football teams, providing an entirely plant-based meal to supporters, becoming the first vegan football team in the world, and minimising the environmental effects of meat production. Solar panels, rainwater collection, and an organic field are all sustainable features of the club's stadium, *The New Lawn* (Forest Green Rovers n.d.). In addition, they have implemented recycling and waste reduction activities within the stadium. The club even urged supporters to carpool and take public transport on game days to cut carbon emissions. It has partnered with local businesses and groups to advance environmental projects and education and sponsored and collaborated with green and sustainability-minded companies. All these actions assisted the club in becoming a recognised international example of environmental leadership in sports, raising awareness of sustainability concerns in an industry where these concerns were not a priority. The local community has supported the club's environmental measures, which helped grow its fan base. The media attention that Forest Green Rovers FC sparked because of this helped the team become a more recognised brand and draw in sponsors. Contrary to fears, the club's sustainability efforts did not jeopardise its capacity to maintain a stable financial position and, in some circumstances, increased revenue through partnerships and item sales. In conclusion, Forest Green Rovers' innovative sustainability strategy, which was centred on becoming the greenest football club in the world, has had several positive effects, including environmental leadership, community support, and financial stability. It has also inspired other sports organisations to adopt more sustainable practices (FIFA 2022).

4. Context

4.1 Benfica – Organisation, Infrastructure, and Values

Originally founded in 1904, Sport Lisboa e Benfica is one of the top football clubs in Portugal, evidenced by being the club with the most significant number of trophies won, 114 (Sport Lisboa e Benfica n.d.), and by being voted 12th in the FIFA Club of the Century ranking. However, since its inception, Benfica has become more of a sports organisation than a football club. The club is involved in more than 30 other sports, including basketball, handball, futsal, volleyball, and athletics. This involvement is multi-dimensional as Benfica not only competes but also provides formation in most of these sports. The club also had to invest in its infrastructure to support this gradual growth. Currently, the infrastructure is mainly composed of multiple structures in the heart of Lisbon, Benfica: The stadium *"Estádio da Luz"* and its surrounding area, the indoor sports arenas, the club's museum, the official store, and a swimming pool complex (Sport Lisboa e Benfica n.d.). Another crucial infrastructure for the club is its football formation and training centre, Benfica Campus, with facilities capable of housing more than 80 resident players and ten different teams (Sport Lisboa e Benfica n.d.). In addition, there are also a variety of official stores (Sport Lisboa e Benfica n.d.) and sports formation and training centres spread across Portugal (Sport Lisboa e Benfica n.d.). Finally, the last of SLB's infrastructure is the multitude of branches and delegations, called *"Casas Benfica"*, present worldwide and which serve as youth and community engagement centres (Sport Lisboa e Benfica n.d.).

To coordinate the club's activities, Sport Lisboa e Benfica's management is composed of a wide array of entities spread across different steps. The President, Rui Manuel César Costa, forms the upper step alongside the Board of Directors, the Legal Council, and the General Assembly. The lower steps are subdivided into different departments: football, modalities, finance, commercial, communication & media, IT, international, legal, maintenance,

marketing, logistics, retail, human resources, health, Benfica Foundation, and safety & security. These entities ensure the organisation is run efficiently and according to its values of sporting ambition and total commitment to the Club, team, and colleagues. Promoting humility in actions and behaviours, solidarity for all, and a culture of respect, ethics, and fair play (Mil-Homens, n.d.).

With an integrated sustainability strategy named ECO Benfica, the club has invested time, effort, and capital into creating a foundation upon which it hopes to build its environmental initiatives, counting eight unique initiatives as of 2023, each with its area of effect. The project already has several ongoing initiatives to achieve this goal: washing stadium seats using rainwater, irrigating fields with groundwater, installation of thermo-photovoltaic panels, among other measures. As if that wasn't enough, ECO Benfica introduced a "reusable cups system" at *Estádio da Luz* and other infrastructures to actively include supporters in sustainable initiatives on match days (Sport Lisboa e Benfica n.d.). The program also involves a specific implementation to transform used cooking oil into biodegradable detergent.

4.2 United Nations Initiatives

Climate change is a global issue that threatens our planet and future generations. The world of sports, as previously stated, also needs to be engaged in mitigating the same crisis. Some potential effects of climate change include extreme temperatures, prolonged droughts or floodings, rises in sea levels, coastal erosion, hefty rain, and heat waves (United Nations Climate Change 2018). These climate change effects may have significant financial, operational, and logistical repercussions for sports clubs, such as the destruction of infrastructures, consequent cancellations and postponements of sports-related activities, differential timing for some events, and player injuries, among many others.

In December 2018, the United Nations launched a new initiative called *Sports for Climate Action* (International Olympic Committee 2019), for which all sports organisations are invited

to join. This movement aims to move the sports industry towards the Paris Agreement's goal of a net-zero carbon emission economy by 2050. In particular, it recognises and supports the International Olympic Committee's role in promoting critical climate change action programs. As such, all *Sports for Climate Action* stakeholders should acknowledge that goal-setting is central to spurring the sports industry to undertake concrete climate actions and develop ambitious climate targets to reduce GHG emissions. The main requirements are listed below:

Exhibit 1: Main S4CA targets

One mid-term target to reduce GHG emissions by 50% by 2030 at the latest. 2019 baseline is recommended but signatories should choose the latest year for which data is available.
One long-term target to reach net zero GHG emissions by 2040
Targets should be inclusive of scopes 1, 2 and 3 (categories which are material to total emissions and where data availability allows them to be measured sufficiently).
Organizations for which scope 3 represent 40% or more of total emissions generated by the organization to model Scope 3 emissions and set Scope 3 targets as well.
Process of Commit, Plan, Proceed and Report will enter into force effective December 2021.

Source: United Nations, n.d.

Given the outlined objectives, it is evident that one of the essential parts of corporate members' sustainability efforts relates to the comprehension and control of GHG emissions, which are usually grouped into three scopes. Wade (2023) stated that Scope 1 emissions arise from a company's owned and managed resources, which include transportation, manufacturing processes, and refrigerants used in air conditioning. On the other hand, Scope 2 emissions refer to the indirect emissions such as electricity used to generate purchased energy. For example, the grid electricity, consumed for such tasks as lighting and recharging electric vehicles, causes this type of emissions. Scope 3 emissions further widen the picture to include all other indirect emissions attributable to an organisation's processes, products, and services outside Scopes 1 and 2. This includes business travels, employee commute footprint, and emissions associated

with a firm's purchases, goods, or services. According to the author, such scope 3 emissions correspond to 60% to 90% of total emissions and are often divided into upstream and downstream emissions to illustrate their impact before and after a company's direct management.

Sports for Climate Action - Guiding Ideas

The *Sports for Climate Action* initiative aims to give participants a structured approach to climate action where sustainability and climate change are integrated within their organisations' strategies, policies, and operations. These principles allow the companies to uphold their environmental obligations while promoting wider dissemination of climate action messages outside the sports industry.

Exhibit 2: Five guiding principles of S4CA

Principle 1: Promote greater environmental responsibility by making systematic efforts.	The business should adapt its operations or infrastructures to climate change beyond sporadic environmental actions. This is possible by instituting board-level sustainability responsibility and adopting efficient strategies for reducing environmental impact. According to the initiative criteria, GHG emissions (Scope 1, 2, and 3) must be measured within six months of joining the initiative.
Principle 2: Reduce the overall climate impact.	The United Nations requires all organisations, regardless of size, to take short-term measures, including developing a plan detailing their goals within a year of committing and submitting it. Additionally, participants should provide an annual update on their climate action progress.
Principle 3: Promote climate change education.	The third principle emphasises the importance of sharing know-how on climate change. The participants should diffuse expertise on climate matters to promote cleaner options.
Principle 4: Promote responsible and sustainable consumption.	Sports organisations are warned to embrace green practices and incentivise stakeholders to provide greener alternatives. For instance, promoting the adoption of eco-friendly modes of transport may help to reduce emissions associated with sporting events and activities.
Principle 5: Facilitating communication towards climate change response.	The last and fifth principle encourages using different communication means such as broadcasting, social networks, using athletes as ambassadors, or promoting environmental initiatives in the events. It should spur supporters, athletes, and the supply chain to act greener.

Source: United Nations Climate Change 2018.

By signing up for the *Sports for Climate Action* targets and principles, sports signatories also become part of the Race to Zero campaign - a global initiative towards low-carbon recovery that unlocks inclusive and sustainable growth (United Nations Climate Change 2018a). Every Race to Zero partner should aim to cut emissions by half by 2030 and reach net zero emissions as soon as possible.

Football for the Goals: Sustainable Development Through Football

United Nations also launched the project "*Football for the Goals*" on July 6, 2022, the opening day of UEFA Women's EURO 2022. Through this project, the international football community would be gathered to incite transformation towards the UN's SDGs to acknowledge and ensure that football is a sport designed for everyone (United Nations and UEFA 2022). Values like advocating for SDGs advancement, following human rights conventions, and combating inequality (including gender inequality) should be part of their conduct in every aspect of the football industry, such as on-field, media presence, and business collaborations. This clearly shows the impact of football globally. All communities, regardless of their culture or origin, should be able to play it on improvised fields or even schoolyards. One of the project's dedicated members is *Fundação Benfica* – SL Benfica's official foundation, established in 2009 and whose sole purpose is to serve as a social extension of the club, fostering inclusion, environmental awareness, and educational opportunities for those in need, particularly children and young individuals living in precarious social environments. Amina J. Mohammed, the United Nations Deputy Secretary-General, even highlighted: "All you need is a ball for people to come together" (UEFA 2022), evidencing the power of football regarding inclusivity. As the founders of the *Football for the Goals* initiative, UEFA has acknowledged that change can happen in European soccer and sport in general. Furthermore, UEFA's President, Aleksander Čeferin, remarked that UEFA has a role in delivering sustainable ideas into the game of football (UEFA 2022).

5. Analysis

5.1 External Analysis

5.1.1 Porter's 5 Forces: Sustainability

To better understand the conditions in which SL Benfica will be competing, it is crucial to thoroughly analyse the industry in which the club is inserted. As Michael E. Porter put it himself in his work "*The Five Competitive Forces That Shape Strategy*", published in 2008: "Understanding the forces that shape industry competition is the starting point for developing strategy". As such, this five forces framework was chosen to better grasp how competitive the industry of Portuguese sports sustainability is.

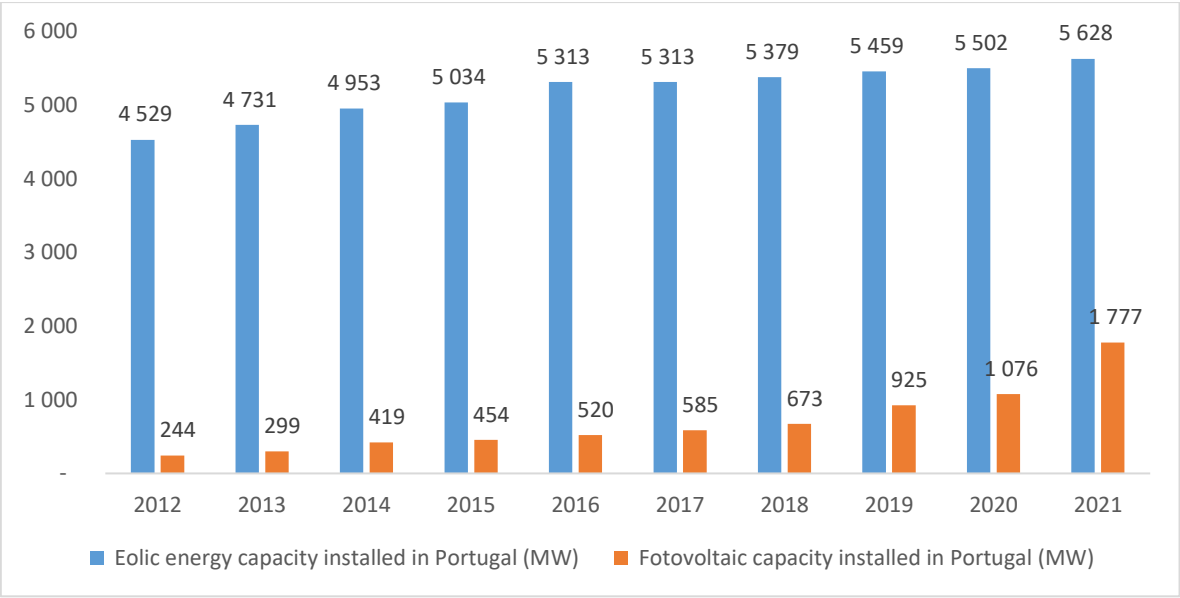
Competition in the industry - High

Regarding sustainability in the Portuguese sports club industry, everything is still an open book. Much like the fan support, Portugal's sustainability efforts come mainly from the three most prominent clubs in the country – SL Benfica, Sporting CP, and FC Porto – who have made the most significant changes to their business models. Moreover, besides having the most significant fan support in the country, SL Benfica seems to be the only one with an already tangible strategic vision in this field, which could give the club a first-mover advantage. That being said, the competition between these three clubs has always been fierce. It remains as such, so even if SL Benfica is ahead of its competitors today, it does not mean the club should not consider their potential in the industry to be a severe threat. In this sense, the Portuguese sports sustainability industry can be categorised as a "monopolistic oligopoly", a mixture of an oligopoly, explained by the fact that there are few firms with real tangible impacts, and monopolistic competition, as the products/services these firms offer are but slightly differentiated.

Bargaining power of suppliers - High

Suppliers are very powerful when setting prices in the Portuguese sports sustainability industry. If, for example, a sports club wants to invest in renewable energy production, whatever the form, and sell the excess to Portuguese energy suppliers, they will be forced to sell it at a low price, as suppliers know the seller will prefer to sell the leftover energy for a low amount over letting it go to waste. Two significant upsides will likely change the paradigm in the coming years: first, as sustainability is becoming a legal imperative, the investment in sustainable practices in Portugal has been increasing throughout the years (See Exhibit 3), and as such, if demand steadily increases, so will the supply for such practices, as stated by Inoua, Sabiou, and Smith (2023), making prices more competitive and choices more abundant. Secondly, investing in sustainable practices can be considered a non-asset-specific investment, as the investment in energy production or subterranean water and rain recapture, for example, can have multiple profitable applications for the club in the long term. This shows that even though sustainability is a supplier-centric market now, supply will likely increase in the coming years, allowing companies to develop better solutions at lower prices.

Exhibit 3: Energy capacity installed in Portugal



Source: Expresso (2022)

Threat of new entrants – Low

The sports industry is very capital and labour-intensive, requiring constant investment in tangible infrastructure and expensive human capital, such as players, scouting networks, or healthcare professionals. Furthermore, even though making sports clubs sustainable can increase their efficiency and brand value, as stated by Roseira Cayolla et al. (2023) and Sroufe (2018), it will take already established clubs much capital to achieve, as these are long-term investments that may require the complete overhaul of current processes used by the clubs. On one hand, this creates a significant entry barrier for smaller clubs that need to possess the necessary capital. On the other hand, the smaller the club, the easier it is to chase sustainability without redesigning and restructuring already-established processes, just like in the case of the Forest Green Rovers. Currently competing in the 4th tier of English football, the club has surprisingly been dubbed by FIFA the *"greenest football club in the world"* and, as such, has gained massive media coverage in recent years and piqued fans' interest from all over the world (Forest Green Rovers n.d.). Licensing, for one, is a non-existent barrier in this sector, as clubs do not require specific licenses to pursue sustainability practices. On the contrary, clubs are entitled to specific badges and marketing material if they want to adhere to internationally recognised sustainability frameworks, like UN initiatives S4CA or F4TG.

Nonetheless, capital and planning are the big "ifs" in this industry. Since the three leading clubs in the country are too well-established in the industry, SL Benfica does not have to worry about new entrants for now.

Bargaining power of buyers – Low

The sports industry's price elasticity of demand ratio is considered almost unanimously by literature to be inelastic ($0<E<1$), as stated by Krautmann and Berri (2007). This means that an increase in the prices of game tickets, for example, will not result in a proportional change in demand for said tickets, and buyers will endure price increases to some extent for the sake of

attending the game. Furthermore, even though the club depends on its fans to survive (e.g., game ticket sales and merchandising), not only is the club the one who sets the prices and fees fans will have to pay, as it also holds a variety of other ways to make its existence financially viable, namely the sale of players or success in competitions. As such, buyer dependency in the sports industry is not as severe as in other sectors, which may depend solely on final consumers to achieve profitability and justify their existence. It is also worth noting that one incentive to become sustainable is to influence fans' perception of the club and, consequently, their economic involvement with the club (Roseira Cayolla et al. 2023). Because of this, it can be argued that this puts some power on the fans' side, although it all comes back to the measures the club itself is taking to change this perception, not necessarily to their bargaining power. Because of this, we consider the bargaining power of buyers to be low in the sports sustainability industry.

Threat of substitutes - Low

If we first look at fan support, SL Benfica does not have to worry about substitutes, at least for now. To put things into perspective, if we account only for Portuguese individuals, as of February 9^{th,} 2022, 46% of Portuguese individuals support SL Benfica, while 24.7% and 23.8% support FC Porto and Sporting CP, respectively, leaving a mere 5.8% of Portuguese individuals distributed across the remaining Portuguese clubs (Observador 2019). This puts SL Benfica significantly ahead of its only possible substitutes in the Portuguese market. Furthermore, literature shows that fans and clubs possess a bond that goes much further than previously believed and that fan loyalty goes beyond the actual success of the club in the competitions it is inserted in or the club's current star players, as demonstrated by Maderer, Holtbruegge, and Woodland (2016). The authors suggest that fans' attitudinal loyalty is developed mainly because clubs give meaning to their lives, and although the club's success and its star players may undoubtedly add to that feeling of purpose, many other aspects, such as nostalgia, benefit

associations, or even greener policies, can be just as crucial in doing so. The situation remains the same if we look at substitutes from a sustainability perspective. Out of the three most prominent clubs in Portugal, SL Benfica has the most sustainable initiatives in quantity and quality and is the only one following what seems to be an actual sustainability strategy or at least the beginning of one. FC Porto seems to have a few partnerships and small initiatives. However, they are neither large enough to be considered a part of a larger strategy nor properly disseminated amongst the club's channels. Sporting CP seems to be planning a strategy with concrete objectives, but they are still in an initial phase compared to SLB.

5.1.2 PESTEL

Analysing the external environment surrounding the industry is vital; hence, a PESTEL analysis was conducted for this effect. First mentioned by Francis J. Aguilar in his book "*Scanning the Business Environment*", published in 1964, PESTEL's use was justified by the author by the proactive need businesses must have to understand the environment that surrounds them and continuously search for opportunities and anticipate threats.

Political

Sustainability has been increasingly crucial within political institutions and governing bodies, and sports do not deviate from this trend. FIFA and UEFA have been developing numerous sustainability strategies, pledging themselves to global initiatives and working towards spreading awareness of this topic within the sports community. Additionally, not only football clubs but also Olympic committees, sporting federations, and foundations have recognised the issue and helped foster sustainability frameworks. Furthermore, the Portuguese government acknowledges the need for compatibility between financial development and environmental protection in both its constitution (Constituição da República Portuguesa 1976, Art. 66) and in law 98/2021, passed by the Portuguese parliament on the 31st of December 2021. Overall, it

can be safely assumed that there is plenty of political awareness regarding sports sustainability, and it is only bound to increase throughout the years.

Economical

Economically speaking, it is worth noting that the global green technology and sustainability market is valued at $16.5 billion as of 2023 and is forecasted to more than triple in value by 2030, implying a compound annual growth rate of 20.8% (Laricchia 2023). This, along with the $600 billion estimated worth of the global sports industry (Sharma 2023) and the €29.5 billion European football market size estimation for the 2021/22 season (Deloitte's Sports Business Group 2023), is evidence that there is indeed a significant financial investment in sustainability within European football and more to come. In addition, it is well known that the most apparent path to tap into the European economic potential within the sports sector is participating in European competitions, like the UEFA Champions League or the UEFA Futsal League, and as such, for most sports clubs, investing in their squads becomes a priority when compared to similar investments in infrastructure. On the other hand, overinvestment in the squad can have adverse effects and hurt a club's sporting performance, and clubs must find the right balance year after year (Dantas, Borges, and Silva 2020). For Portuguese clubs like SL Benfica, however, one of the most prominent ways of realising financial gains is to sell their high-potential football players, as shown by the staggering €1 billion in player sales the club has made since the turn of the century (Muralidharan 2023), even though the club has also made at least €72 million from UEFA CL participation and prize money during their 22/23 campaign alone (SIC Notícias and Lusa 2023). Even though SL Benfica is not only a football club, as it encompasses many sports modalities, football is clearly where the most capital is invested. This is evident in the club's investment in their current football squad, which amounts to about 188 million euros (Lusa and Diário De Notícias 2023), as opposed to the mere 31 million Euro

proposed expenses in all other modalities combined for the 2023/24 season (Sport Lisboa e Benfica n.d.).

Social

Sports organisations can also catalyse social change, especially in Portugal. In Benfica's case, social change usually comes through the Benfica Foundation, which was established to promote social initiatives and give back to the community. Although SL Benfica is not the only club in Portugal with such a foundation, they have been able to somewhat "level the playing field" with initiatives such as humanitarian campaigns for Ukraine (Sport Lisboa e Benfica 2023) and the *"Para Ti Se Não Faltares"* campaign, that has managed to successfully prevent more than 3,000 children from dropping out of school in 2018 by using the concept of "inclusive sports". All the initiatives for the year 2018 involved over 30,000 beneficiaries from various nationalities and international backgrounds (Sport Lisboa e Benfica 2018). This number is forecasted to grow as the UN's SDGs emphasise the need to focus on social change.

Technology

The world of sports has become increasingly prone to the use of technology, not only for the pursuit of sporting accuracy but also for efficiency and sustainability. For example, TMO has been used in rugby since 2001 (Sheridan 2023). In contrast, football's counterpart, VAR, has only been introduced in European leagues during the 2017/18 season (Farrell 2019), while goal-line technology was used for some time before that. Football can also make use of ML algorithms to create processes that go in line with the UN's SDGs, making use of predictive analytics to optimise supply chains and improve efficiency, employing extended reality for education purposes within their communities, or even making use of groundbreaking renewable energy technology to achieve self-sufficiency, as pointed out by Păun (2023). Nonetheless, we can find evidence that most participants in the ecosystem highly advocate for further use of technology in the game when used to improve efficiency in proc350 Messes related to

organisation efficiency but not as much for aspects that affect the core rules and values of the modalities themselves (Beiderbeck et al. 2023).

Environmental

Concerning environmental factors, it is understood that environmental practices and precautions are being implemented by big European enterprises as well as medium and small ones (Eurobarometer 2022). The estimated carbon footprint for the global sports industry is 350 million tons of CO_2 (Sharma 2023); as such, much progress is still being made to achieve carbon neutrality. Nevertheless, in the Portuguese landscape, SL Benfica is the club leading the environmental sports revolution and the national reference in terms of sports sustainability, evident by the fact that they seem to be the only club with a clear development of sustainable initiatives already promoted in their official website (Sport Lisboa e Benfica n.d.), an opportunity the club needs to explore and continue to foster.

Legal

From a legal perspective, it is evident that environmental and social rules are being reinforced by governments worldwide, and companies that fail to follow these regulations may risk legal implications, fines, and reputational harm (Joyner 2017). On the 23rd of February 2022, the European Commission proposed a directive for corporate sustainability due diligence, the CSDD Directive, which would see all EU companies identify, prevent, and account for environmental human rights impacts mandatorily. This comes as no surprise, as voluntary climate action has yet to yield the results that were hoped for, and the situation is only likely to change when there are profound legal implications for European firms that do not comply with EU climate regulations. In this sense, this can also be seen as an opportunity for companies willing to modernise and improve their value chains to more sustainable models of their own accord and not do so in a rush later or in fear of legal repercussions. Furthermore, it is also worth noting that more and more financial fair-play regulations have been implemented in

European sports, especially football, designed to monitor the breakeven requirements specified by UEFA for European clubs and to ensure clubs do not incur excessive overdue payables. Despite the controversy, these financial fair-play regulations have been met by wealthy European clubs, who naturally oppose more regulation on their financial expenditures; research has mostly concluded that they are necessary for guaranteeing minimal sporting fairness (Muller, Lammert, and Hovemann 2012).

5.2 Internal Analysis

5.2.1 VRIO Framework

As stated by Barney (2000), the VRIO analysis, as a part of the resource-based view of sustained competitive advantage, aids in assessing the contribution of an organisation's resources to its position in the market. Companies must nurture and fully utilise their highly valuable, rare, inimitable, and Organised resources, as they will severely impact their ability to compete in the market (Mind Tools Content Team n.d.). As such, a simple VRIO analysis was undertaken to understand Benfica's most prominent resources.

Benfica's most prominent resources in 2023 were actually the UEFA awards, representing 37.9% of revenue by business unit; the sale of audiovisual (television) rights, accounting for 26% of revenue by business unit; sponsorships, depicting 12.2% of revenue by business unit; and the ticketing or game revenues expressing 12.2% of revenue by business unit (MarketScreener 2023). However, the previously stated resources are not sources of competitive advantage since they are resources almost every other football club has access to, although on different scales. Where Benfica can distinguish itself from the other football clubs at a national and international level is in the development of young athletes and the revenues from their respective sales (Sprung 2019). As previously stated, over the last decade, Benfica has made more than one billion euros in player sales (Hughes 2023). In fact, by 2017, as stated in Wired (Wired 2017), Benfica achieved £270 million – approximately €313 million – in

revenues for player sales only in 6 years, reinforcing their long-term strategy (Ransom 2023) of increasing revenue in the rubric of its balance sheet named *"Rendimentos com transações de direitos de atletas"* shown in its annual 2023 report (Sport Lisboa e Benfica 2023a). This long-term value creation strategy has been bearing fruit, placing Benfica as the European club with the highest revenues from the transfer market in the last ten years, and as the only club that has reached the mark of one billion euros in transfers in the same timespan (Fish 2023).

This being said, it is evident that unlike most other teams aiming to make money overseas, SLB is taking a different route. While other clubs participate in commercial relationships with companies worldwide, the Portuguese club has put its chips on this specific strategy. In the pursuit of competing with European football powerhouses and with the increasing costs of acquiring new players, the strategy of developing young talent has definitely been SL Benfica's main focus (ThierryHenry14 2018). As soon as the club recognises young players with potential, it sets out to develop them in three prominent ways: providing them with world-class coaches for training, a strong and solid developmental methodology, and technology that monitors factors like injuries, sun exposure, nutrition, and a variety of other variables (Sprung 2019).

In this sense, the club has created an alternative model that no European club provides, known as "Business 2 Football" (B2F). The model is centred around Benfica's long-term player development technique and is delivered directly from the club's campus. Some programs include coach development, team training camps, player development, technical collaborations, and specialised projects with federations and associations worldwide (Kronenberg 2023).

Bernardo Faria de Carvalho, global expansion officer at the club, said to football business intelligence newsletter *Off the Pitch* in 2023: "Talent development is the core of this club, and we need to make sure that our talent pool is big enough. Fewer and fewer kids play football in Portugal, and we have adjusted our strategy to that". Due to the scarcity of children playing

football in Portugal and with fewer football players overall, despite having 50 football schools spread out over the country, Bernardo Faria de Carvalho also claims that they are currently working on creating a worldwide set of academies in places where potential may be discovered at a very young age, such as South America, Africa, and the USA. (Kronenberg 2023).

Developing young talent has given the club solid performances on the pitch and high revenues once the players are sold, generating value on both fronts. The talent itself is hard to find, which is one of the reasons Benfica is expanding its influence all over the world. In addition, unlocking the potential of young players the way SL Benfica has done is inimitable, seeing that it takes time and commitment. Besides, only Benfica's three-factor development plan has yielded inimitable revenues in the Portuguese football market, as its direct rivals, who pursue similar talent-developing strategies, seem to fall short in both sporting and financial performances.

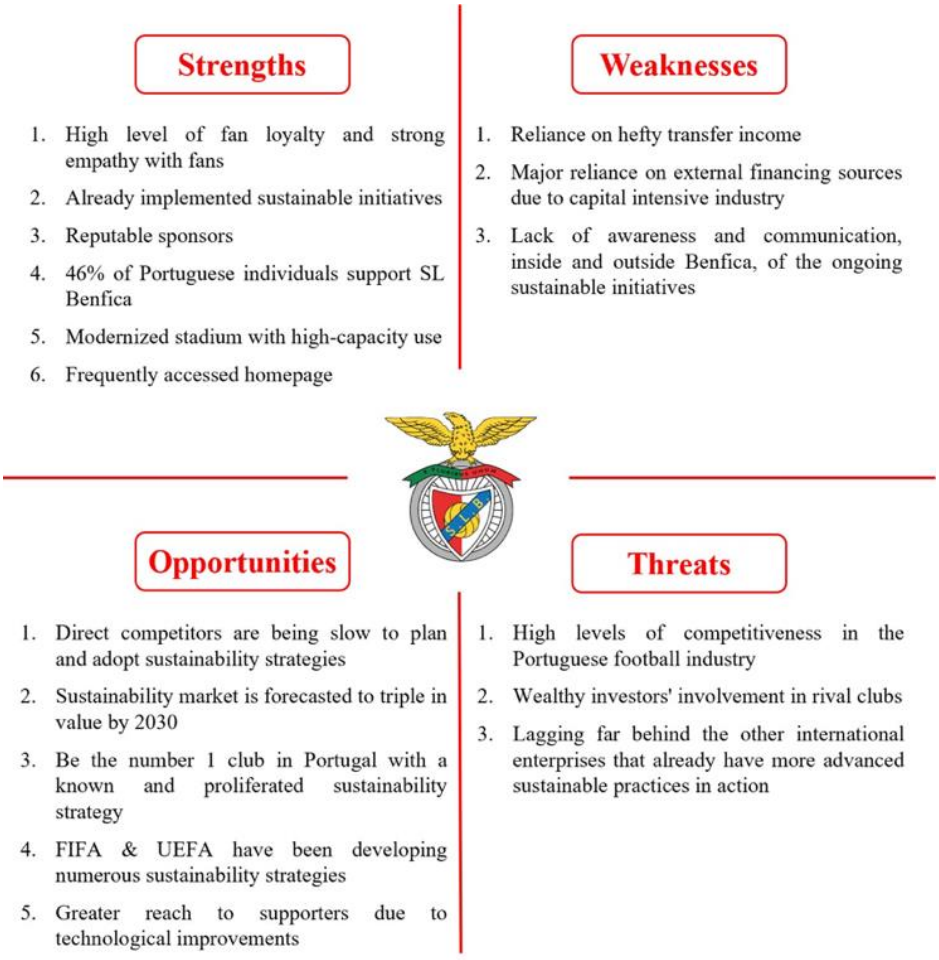
In this sense, Benfica has already structured its organisational processes around this critical resource, and by using the VRIO framework as an analysis tool, SL Benfica's strategic development of young players seems to bring the club a sustained competitive advantage in the long run, as other clubs do not seem to harness it quite the same way.

5.2.2 SWOT Analysis

A SWOT analysis was also performed to complement SL Benfica's internal structure analysis and further solidify the overall landscape for the project's strategic planning process. This analysis is regarded by literature as one of the best ways to understand how a specific organisation functions around its resources and faces major threats or weaknesses it may have (Bertelsen 2012). The study has proven to be the foundation for developing successful strategies and doing in-depth research on a firm and its market environment. SWOT stands for Strengths, Weaknesses, Opportunities, and Threats (Leigh 2010). The first pair of words describes a corporate internal examination, whereas the second focuses on an external assessment.

The SWOT analysis provides new perspectives on where a company is right now and assists in creating the ideal plan for any circumstance. One could be fully aware of an organisation's strengths but only know how dependable they are once listed alongside weaknesses and threats. Similarly, after thoroughly examining a company's vulnerabilities, these may show previously unnoticed potential (Mind Tools Content Team n.d.). Therefore, performing a SWOT analysis assists in exposing unsafe assumptions and performance blind spots inside a company (Gürel and Tat 2017).

Exhibit 4: SWOT Diagram for SL Benfica



Source: Own elaboration

The matrix presented in Exhibit 4, with the four previously described components, was created for strategic evaluation and represents SL Benfica's strengths, weaknesses, opportunities, and threats. The elements of SL Benfica's SWOT analysis were combined and used to create four different types of strategies:

S/O – Strategies optimally combining internal strengths with external potential opportunities.

W/O – Strategies aimed at mitigating internal areas of weakness by seizing opportunities from outside forces.

S/T – Strategies rendering the use of internal resources to combat threats.

W/T – Strategies strengthening internal weaknesses to counter threats.

The following SWOT analysis for Benfica was developed using the club's competencies, resources, and additional data on opportunities and threats, which led to factual, logical, and tactical combination choices:

S1/O5: The high level of emotional loyalty and empathy with fans, together with the increasing interest in football and the high number of members, can be improved through the development of technology, being able to connect with all fans spread across the entire globe.

S2/O2/W3/T3: With the sustainability market expected to more than triple in value by 2030, the club can explore and improve already implemented sustainability initiatives. It could be an essential factor that would help combat the need for more awareness of the club's ongoing sustainable initiatives and enhance its identity as a company at the forefront of this specific market. This could substantially narrow the brand identity gap between Benfica and other international sports organisations with more financial capabilities, making it easier for the club to navigate changing times and global priorities while also being a renowned organisation for sporting greatness.

W2/S3/O3: Given the heavy reliance on external funding sources due to the capital-intensive nature of the sports industry, reputable sponsors are critical partners for all sports clubs. By

being the number one club in Portugal with a well-known and proliferative sustainability strategy, Benfica would solidify its position in the Portuguese market and attract more sponsors willing to create partnerships with a club that shares its values of growth and prosperity. These sponsors would then mean either more revenue or less costs for the club, which would help it grow faster and allow it to reach new heights in the international sphere.

W3/O5: The internal and external need for more awareness and communication about ongoing sustainable initiatives can be addressed and improved by technology, modernising Benfica's website and application. This way, Benfica would increase its reach and add value to its widespread supporters.

T1/O4/S2/O1: Despite the competitiveness in the Portuguese football industry and even with FIFA and UEFA developing numerous sustainability strategies, Benfica's direct competitors, Sporting CP and FC Porto, have shown a lag in planning and adopting sustainability strategies when compared to what Benfica has already implemented. There is an opportunity to widen the sustainability gap and capitalise on being the number one club in Portugal in terms of SPs.

S6/O5: The club's widespread website and social media pages serve as a springboard for adding further features that would promote digital sales.

6. An Analysis of LEED Implementation in Estádio da Luz

Introduction

This section of the work project focuses on exploring the opportunity that the application of a green building certification to a stadium presents for a football club wanting to develop a concise sustainability strategy. Thus, firstly, the impact that buildings have on the environment and the solutions available to organisations to combat that was investigated, followed by research around what green building certifications consist of and the benefits they are able to deliver to companies. Lastly, an analysis of LEED implementation to Benfica's stadium, Estádio da Luz, was conducted. This analysis was subdivided into four parts: 1) a description of the advantages of LEED and the opportunities it creates for the corporate world; 2) understanding how this specific green building certification fits into Benfica's environment; 3) an assessment of the most adequate LEED rating system for the club; 4) and finally, an estimate of what the financial valuation of the implementation project could look like.

Environmental Impact of Buildings and Context Within the Sports Industry

Everyday millions of people have their routines revolve around different buildings. Whether it be for work, health, entertainment, or other purposes, buildings are intrinsically playing a big role in human life. Consequently, these constructions have a significant impact in the society and in the world's environment due to their processes of creation and operation. According to the World Green Building Council, 38% of the global energy-related carbon emissions and 50% of all extracted materials can be attributed to buildings (World Green Building Council 2022). Additionally, a NABERS study indicates that 40% of the world's energy and 30% of the available drinking water are used by buildings (National Australian Built Environment Rating System n.d.), further complementing the WGBC research. Moreover, most of the environmental impact of buildings comes in the use phase, as stated by Heeren et al. (2015).

Within the sports industry the picture reflects some of the same issues outlined in the paragraph above. A simple Google search such as “environmental impact of sports teams” returns a long list of results with most of them mentioning sports events and their effect on the environment. One of those articles highlights that energy consumption, transportation of athletes and supporters, and the construction and maintenance of venues for sporting events are the main sources of greenhouse gas emissions (Kaminsky n.d.). This is reinforced by a case study of Wolfsburg FC, a leader in response to the climate crisis within German football, where it was found that 60% of the carbon footprint can be attributed to fan travel, 8% to team and employee travel, and 18% to heating energy (Goldblatt n.d.). Undoubtedly, the whole purpose of the sports industry climaxes in the moment of the sporting event, whether it be a football match, Formula 1 race, or American football game, and in the heart of the event is the sporting venue. In regard to the environmental impact, this close connection between event and venue is also noted. The United Nations Environment Programme mentions exactly that: building and managing a sports facility and operating an event both have great consequences when it comes to air and water pollution, greenhouse gas emissions, waste generation, and many other environmental damages; thus, it further accentuates the significance of this event-venue crossover (Knowledge at Wharton 2013).

The Construction Industry’s Answer: Green Building Certifications

The construction industry has been conscious of such type of negative effects at least since the 60s, as evidenced by the development of ideas such as ecological architecture (Pacific Northwest National Laboratory 2021). However, serious growth of sustainability within the industry only started to be seen after the 1987 World Commission on Environment and Development, also known as *the Brundtland Report*, popularised the concept of sustainable development at a global level (Segger and Khalfan 2004). Along with this trend of increased awareness towards sustainability, some initiatives emerged with the intention of promoting a

more sustainable thinking approach within the industry. Amongst these initiatives, in 1990, the world's first green building standard, the BREEAM (Building Research Establishment Environmental Assessment Methodology), appeared in the United Kingdom, and was followed by the creation of the United States Green Building Council in 1993 (Pacific Northwest National Laboratory 2021).

There are many different definitions of what a green building is. The USGBC classifies it as a holistic concept that aims to amplify the positive and mitigate the negative effects that the built environment has on the natural environment and the people that inhabit the buildings every day, throughout the entire life cycle of a building. This life cycle encompasses all the phases of planning, design, construction, and operations of a building (Kriss 2014). Essentially, a green building is one that is able to maintain or improve the life quality of the environment it is inserted in (Iberdrola n.d.). A building can be attested as a green building through a green building certification, like the BREEAM standard mentioned previously. As Mark Simon, a built environment expert from the University of Yale, defines: "a green building certification verifies that a building has met environmental, energy, human health, and other standards in its design, construction, and performance" (Yale Sustainability 2020).

Nowadays, there is a wide array of green building certification options available. If looking exclusively at the ones administered by the World Green Building Council, there are more than 50 offered by the green building councils spread throughout the globe (World Green Building Council 2021). The main differentiation points between certifications lie in the focus areas of their sustainability requirements and in the evaluation method used (Di Noto 2023). In what concerns to the area of focus, organisations may choose to orientate their certifications towards human-health, energy efficiency, water efficiency, environmental performance, and/or many other directions within the realm of sustainability. Consequently, organisations looking to have buildings certified as green ought to understand the various alternatives and choose the

certification that better aligns with its objectives, as explained by Yale's Director of Planning Administration Cathy Jackson (Yale Sustainability 2020).

The following are a list of some of the most popular certifications worldwide and their respective distinctive characteristics:

BREEAM – the first green building classification system in the world, centres its assessment around environmental performance using a nine-category framework, which includes energy, health and wellness, innovation, use of the soil, materials, management, pollution, transport, and waste. This framework makes buildings more sustainable, by improving building performance and efficiency. Plus, the certification can be attained in new construction, refurbishment and fit-out, in-use, community, and infrastructure projects.

WELL Building Standard – this certification system differentiates its approach by targeting the health and wellness of the occupants that spend more than 90% of their time in the building. WELL designed buildings serve as a platform to improve nutrition, fitness, and sleep patterns, promote cognitive stimulation and emotional well-being, and assemble the building's community in a diverse way. Some added benefits of this standard include improved employee productivity, reduced absenteeism, and lower healthcare costs. Thus, the most common recipients of WELL certifications are commercial office buildings, in which big corporate names such as EY, Wells Fargo, and Deloitte are present.

Living Building Challenge – considered the most rigorous and demanding certification methodology, it requires buildings to go further than just not harming the environment but to have a regenerative effect by generating more energy than they need, thus offsetting any possible negative outcome. Another distinction is that projects must be operational for at least 12 months to be awarded the certification, proving it is based on actual performance.

LEED – this is the most globally recognised certification, in large part due to its extensive coverage of the sustainability elements, tackling both the environmental and social fronts.

Similarly to BREEAM, it has a wide variety of programs such as new constructions, existing buildings and operations, maintenance, neighbourhood development, and cities. The projects have to follow standards within various focus areas which are then subdivided into prerequisites (mandatory practices) and credits (recommendations). The LEED certification coordinates all building parts to "work together like a giant machine" (Yale Sustainability 2020), which produces greater long-term environmental and financial benefits.

How Green Building Certifications Can Add Value to Companies

Created with the intent to minimise the impact of buildings in the environment, green building certifications have been able to deliver their promise. When compared to traditional buildings, green buildings report reductions in energy consumption ranging in between 30 to 40%, in water consumption 20 to 30%, and in CO_2 emissions up to 35%. Furthermore, the effects of this approach transcend the improvements felt in the building's outputs, extending to its users. People working in green buildings show 30% fewer signs of "sick building syndrome" symptoms, like headaches and respiratory irritation, and sleep scores are also 6% higher on average (Mariotti 2023). Mental health is also positively affected with evidence of lower levels of stress and depression (United States Green Building Council n.d.). These improved health outcomes are then one of the likely reasons why in standardised tests of planning and critical thinking abilities the same workers deliver results 25% higher and show an increase of 16% in productiveness, when compared to workers in non-green buildings (Mariotti 2023). Moreover, for companies, this translates to lower rates of absenteeism due to sick leave, and better employee retention, as people will feel happier and healthier, which drives up job satisfaction (Method Recycling 2022).

However, environmental and health impacts are not enough for corporate firms to undertake projects, economic benefits play a substantial role in the decision-making process of CEOs (Belsie 2012). Within this scope, the improvements in areas such as water and energy

consumption and waste management end up dropping operating costs. On average, green buildings show operational savings of 10.5% in the first year, and of 16.9% over a 5-year span (Mariotti 2023). In fact, being equipped with design systems that drive up building efficiency create the opportunity for green building certifications to be used as operational efficiency frameworks (Method Recycling 2022). In this sense, a successful implementation of the framework results in lowered maintenance costs, and thus, when added to the operating costs' reduction, increase the amount of cost savings produced (Linstroth 2023). Besides this, the 16% increase in productivity of workers mentioned in the last paragraph is also expected to deliver promising returns.

With the approximation of the 2030 UN goals' deadline and the continuous rising of awareness towards sustainability, governments are pressed to push for greener communities and net zero emissions. Consequently, building standards have been getting their requirements reviewed to better comply with the green objectives set. In addition, policy makers have also set up funding opportunities, tax exemptions, permitting fee reductions, and many other initiatives to incentivise building owners to go green, which provides a financial opportunity for companies to renovate buildings with lower associated costs (uHoo Business 2023). Green building certifications, in this context, can serve as a platform to keep companies one step ahead of surging legal requirements established by governments, and thus, gain some clearance towards possible future legislations, which can bring added freedom and autonomy to the firms' operations.

Ultimately, the collection of all the environmental, health and well-being, economic, and legal benefits outlined offer an edge over the competition for organisations. The environmental impacts are capable of providing the building blocks for a successful marketing strategy that leverages the green brand image of the company, based on the initiatives and processes it undertakes, and the consequent differentiation of its product to generate an enhanced product

appeal (Indeed 2022). All in all, companies who pursue green building certifications not only establish themselves as drivers of change but also have a better chance to be an industry leader, as they will appear more appealing to the target market and will stand out more from the competition, as Burns (2020) states.

The Case for LEED Application in Benfica's Stadium

Advantages and Opportunities for Sports Organisations Pursuing LEED

According to the WGBC, LEED is the most used green building certification worldwide, and constitutes a symbol of excellence in green building (United States Green Building Council 2018). This recognition comes as a direct result of proven building performance from LEED certified buildings, which is attested by a variety of independent studies that show similar statistics as the ones from the general landscape of green building certifications described in the last chapter (United States Green Building Council 2013). Some of those studies' findings are presented here:

- As found in a 2011 US General Services Administration's study, energy consumption was 25% lower in LEED buildings when compared to the national average, water consumption was 11% lower, operational costs were 19% lower, and maintenance costs 20% lower. Operational costs of retrofit buildings were also discovered to decrease by 10% in just one year. Plus, buildings with LEED Gold or better grades of certification had particularly high performance (Fowler et al. 2011).
- According to a University of Notre Dame research, in an analysis of PNC Bank's branches, employees in LEED certified buildings generate $461,300 more revenue each than those in non-certified ones (Roddel 2012).
- On average, operating expenses are $2.53 per square foot lower when comparing LEED to non-LEED buildings. Similarly, utilities expenses are $0.80 per square foot lower (Browne 2020).

- A 2008 Deloitte survey discovered that after a green retrofit, workforce productivity had increased in 87% of the companies, 81% had better employee retention, and 75% reported better worker health (Business Development Bank of Canada n.d.).

This global credit amassed over the years puts the LEED certification in the top spot as a choice for businesses, since it provides excellent results in sustainable metrics and opens up opportunities for companies because of the effects on brand image and overall corporate strategy. Craig Ryan, BDC's Director of Corporate Sustainability, presents exactly one of these opportunities: a company that chooses to pursue LEED has better odds of getting financing from a bank as "bankers will perceive LEED certification as a sign of a well-managed company that has a clear strategic plan and good reporting" (Business Development Bank of Canada n.d.).

Besides, LEED is aligned with the UN's SDGs. As stated by the USGBC, the certification achieves synergies with 11 out of the total 17 Sustainable Development Goals and has, in particular, bigger impacts in SDG3 – Good Health and Well-being, SDG6 – Clean Water and Sanitation, SDG7 – Affordable and Clean Energy, SDG9 – Industry, Innovation, and Infrastructure, SDG11 – Sustainable Cities and Communities, SDG12 – Responsible Consumption and Production, and SDG13 – Climate Change (United States Green Building Council 2022). These characteristics make LEED a powerful tool for sports organisations involved in the *Sports for Climate Action* initiative that aim to halve GHG emissions by 2030 and net zero by 2040. Additionally, it also constitutes a way for football clubs involved in the *Football for the Goals* programme, as is the case of Benfica with *Fundação Benfica,* to take significant strides into implementing SDG strategies that lead to behavioural change.

Context of LEED in Benfica's Environment

In Portugal, as of November 2023, there are 107 projects in the USGBC database that have either been LEED certified or in the process of construction and getting the certification.

Amongst these projects, there is not one that corresponds to either a sports arena or stadium, independently of the size of the venue in consideration, and there are no projects that belong to organisations in competitive sports. Analysing the certified projects, it is also possible to check that the majority of the projects (10 out of the total 13) have been awarded the LEED Gold certification level, one has received the LEED Silver level, and only two LEED Platinum. These last two projects correspond to a Saint Laurent store in Avenida da Liberdade, Lisbon, and to the Sonae Tech Hub in Porto, both part of large internationally recognised brands (United States Green Building Council 2023e). The latter of the two, the Sonae Tech Hub, is also the highest rated LEED building in Portugal, with 89 points. It is an office building, part of the Sonae Campus, placed in the World Top 100 LEED buildings and was the fourth to receive the certification in Portugal (United States Green Building Council 2020).

Within the sports industry, there are at least 100 sports arenas or stadiums certified around the world. Although this number is not that significant when considering the global scale, the number of sports organisations chasing LEED is definitely growing (Vincent 2022). Furthermore, according to the USGBC, there is a minimum of 37 venues located in the USA alone, which represents a rather large portion of the spectrum. Most of these venues belong to American football, basketball, baseball, football, or ice hockey teams and are spread out across a variety of states (United States Green Building Council 2023d). Standing out from these venues is the Mercedes-Benz stadium, home of the NFL's Atlanta Falcons and the MLS's Atlanta United, which became the first stadium in the world to be granted a LEED Platinum certification (Merrill 2017).

When it comes to European football specifically, the progress is not as advanced as the one seen in America. In the USGBC database, there are only three football stadiums certified in Europe: the Szent Gellért Fórum and the Hidegkuti Nándor Stadion in Hungary, and the San Mamés Stadium in Spain (United States Green Building Council 2023f). The most relevant of

the three for Benfica's context is most definitely the San Mamés Stadium, playing ground of the La Liga side Athletic Club de Bilbao, which is the one with the largest attendance capacity: 53,331 seats (Athletic Club 2023). Moreover, San Mamés was the first football stadium to be LEED certified in Europe (Athletic Club 2016).

Ultimately, for Benfica, the pursuit of a LEED certification for its stadium would present an opportunity for the club to stand out as the first sports venue in Portugal to receive such accreditation and could even be classified as the "greenest stadium in the country". This could be a building block of a larger strategy that would guide Benfica to be the "greenest club in the country". Internationally, there is space for the club to be one of the first in Europe to have a LEED stadium, and, if Gold or Platinum levels were pursued, to emerge as one of the main sustainability pioneers within the sport. Besides, with the announcement of Portugal being one of the host countries for the 2030 World Cup, the stadium would be in the centre of the world stage to show off its sustainability efforts (Noble, Jopson, and Agini 2023). This is reinforced by the fact that all stadiums in the competition will be required to have sustainable building certifications by FIFA-approved standards (Weston 2023).

Assessment of the LEED Rating System for Estádio da Luz

Inaugurated in 2003, Benfica's stadium, Estádio da Luz, was constructed on the occasion of the UEFA Euro 2004 (Focus Group n.d.). Since then, and until 2020, when some rumours of plans for renovation surfaced, there have not been any signs of major construction projects being in the sights for the future (ZeroZero 2020). With this in consideration, and as there is not a specific LEED for Stadiums rating system, the most adequate system to be applied in Estádio da Luz is LEED v5 for Operations and Maintenance: Existing Buildings, which focuses on optimising the ongoing operational performance of existing buildings (Jain 2023). This would require Benfica to analyse the current state of its stadium and its respective operations, that could lead to the necessity of retrofitting the building to comply with LEED. In addition, this

5th version of the LEED rating system marks an important milestone in the alignment of the certification with the Paris Climate Accord's 2030 and 2050 targets (United States Green Building Council 2023c).

LEED rating systems evaluate projects using different levels of certification. For a project to be rewarded with a certain certification level it must reach the minimum number of points required by that level. The certification levels and the respective minimum requirement of points is here listed: LEED Certified (40-49 points), LEED Silver (50-59 points), LEED Gold (60-79 points), and LEED Platinum (80+ points) (United States Green Building Council 2023b). Points are awarded through the fulfilment of credits that, once added together, determine the project's certification level. Project teams are able to opt how to pursue LEED by choosing which credits to fulfil and how to fulfil them. Besides LEED credits, each project also has to meet specific prerequisites, which do not attribute points to the project but are mandatory to guarantee its certification (United States Green Building Council 2023a). The rating system, LEED v5 for Operations and Maintenance: Existing Buildings, is composed by a total of 15 prerequisites and 20 credits, with some of them grouped by categories that define their target area. See the appendix of this thesis for a table that contains the categories, all the prerequisites and credits, as well as the specific objective behind their implementation and the points available for each credit (Appendix 2).

Most LEED rating systems are generalised frameworks made to be applied to a variety of building types. Consequently, the unique characteristics of the project's site and structure, as is the case for stadiums, may make some points unattainable or at least more challenging to obtain. Vanderweil (2008) lists the most common challenges for sports organisations trying to pursue LEED certification for their venues:

1. Classification of fans: To measure point categories such as alternative transportation, a measurement of building occupancy is required. Most often this measurement comes in

the form of full-time equivalent employees, which counts all people based on average time spent during a given time period, and thus, provides a good level of accuracy and reflection of building usage. Stadiums, due to fan traffic in event days, stand as a unique case where the number of visitors largely outweighs the one of FTE employees. This creates challenges not only in the measurement itself, but also in the development of solutions for the various point categories.

2. Venue lighting: Due to league rules or binding agreements with broadcasting agents, teams may be obliged to reach certain lighting levels during games, which can make some points unattainable when it comes to energy efficiency or lighting pollution.
3. Indoor/outdoor duality: Many times venues have areas that are indoor and outdoor at the same time resulting in added difficulties in the measurement and achievement of the energy conservation process. Although, most times, these areas can be excluded from the calculations and not impede the project from getting points.
4. Non-traditional usage pattern: Stadiums differ a lot from conventional buildings that operate in peak vs. nonpeak hours, hence the design, implementation, and monitoring of the venue's specific systems can become more complex and time consuming. Facility workers that deal with varying climate conditions and changing event schedules will face constant challenges to deliver the energy saving measures. In addition, the payoff time of energy upgrades might differ depending on the specific usage characteristics of each venue.
5. Vendors' adherence to sustainability: Various services provided and needed in stadiums are outsourced. Whether it be food and souvenir vendors, or cleaning and maintenance services, the companies performing these tasks might not get on board with the initiatives developed to tackle sustainability.

6. Venues with multiple teams: Some stadiums or arenas are shared between teams, making it difficult to align needs and interests of both parties, which can lead to the unfeasibility of some greening opportunities. Additionally, the increase in usage will most likely reduce the payoff of implemented energy efficiency measures.

Estimate of Financial Valuation for LEED Implementation

When considering retrofitting a stadium to conform to LEED it is crucial to perform a financial analysis of the project's feasibility. Consequently, a rough estimate of the financial valuation of LEED implementation was performed using the DCF model to generate an NPV for the project. For this, a series of assumptions was made to facilitate the calculations and overcome the lack of necessary data. The values for the tax and discount rate were the ones used in Benfica's report, "Relatório e Contas", for the 2022/23 season (Sport Lisboa e Benfica 2023a). The LEED fees were calculated with the USGBC's LEED Price Estimate tool, that uses the project's gross floor area (United States Green Building Council 2023b) (Appendix 3 and 4). This area was assumed to include the stadium and the surrounding venues, such as, the museum, parking lot, and pavilions, and was approximately measured using Google Earth (Appendix 5). The cost of retrofitting the stadium was estimated to be a premium of 4% over the initial construction cost of the stadium. The value of the premium was obtained through a study that determined that most LEED Gold projects can be fulfilled with only a 4% premium over the initial costs (Mariotti 2023). Additionally, the initial construction cost of Benfica's stadium was 134 million euros (Record 2002). The percentages for reductions of consumptions and costs, achieved through LEED, were the ones mentioned in the chapter "Advantages and Opportunities for Sports Organisations Pursuing LEED". Annual stadium maintenance costs were established according to Ribeiro (2012), who calculated these same costs for Estádio do Dragão. There were two valuation estimates calculated to compute the NPV value, one using

energy and water consumption reductions, and another substituting these two with operational cost reduction.

In the first situation, the annual energy consumption was calculated using an energy consumption per seat value, which was defined by a study performed around Premier League stadiums (Murray 2021). This value was then multiplied by the number of seats in Estádio da Luz, 64.642 (Transfermarkt, n.d.). This operation resulted in the annual energy consumption, which multiplied by the cost of energy in Portugal originated the annual amount saved due to energy consumption reduction. The cost of energy in Portugal was calculated as the average between the current offers of each of the country's energy providers, according to Lojaluz (n.d.). Water consumption savings were calculated in a similar manner. As stated by Moustgaard (2021), a stadium's annual water consumption can reach 100,000 cubic metres. From this number, the amount of water used for the football field, 10,000 cubic metres (Water Lovers of Singapore 2016), was subtracted due to its importance in the context of a football club, originating the value of water consumption used to calculate the amount of water saved yearly. The latter number was multiplied by the cost of water for private institutions of public interest, in which Benfica falls into, defined by EPAL, the company in charge of water supply in Lisbon (Empresa Portuguesa das Águas Livres n.d.). The result is the amount of water saved due to this resource consumption's reduction.

In the second situation, operational costs were established as the average between the stadium's operational costs reported by Benfica in 2022 and 2023 (Sport Lisboa e Benfica 2023a). The operational costs multiplied by the percentage reduction in costs originated the value of savings in stadium operations. This value replaced the savings in energy and water consumption from the first case.

Following the application of the assumptions undertaken, the discounted cash flow model was calculated, for a 5-year period, generating an NPV for the LEED implementation, for each of

the situations described above. The Excel tables containing all the values and calculations performed can be seen in the appendix of this thesis (Appendixes 6, 7, and 8).

The NPVs computed reiterate the understanding gathered from the research around the benefits of green building certifications, and particularly LEED, that it presents a very good opportunity for organisations to review and improve its operations. With possible savings that could reach the hundreds of thousands of euros, or even millions, SL Benfica ought to analyse this possibility of using LEED as: a way of optimising its operations' efficiency and as the initial and main building block to cement and construct a corporate sustainability strategy.

7. Discussion

The present project resulted from Sport Lisboa e Benfica's desire to develop and apply a sustainability strategy that could be used in the coming years, pushing players, staff members, and fans alike to mirror the club's actions and contribute towards sustainable goals. This way, the club can hope to become a leading player in the sports sustainability sector worldwide and possibly take advantage of previously unexplored opportunities and synergies. Scientific evidence was crucial for justifying the strategy's development, asserting that it is possible to be both profitable and sustainable. At the same time, approaching examples of some of the most predominant practices from contemporary sports was also crucial, providing an example of how much success, or lack thereof, to expect from SPs in this sector.

That being said, there was no better way to reap the rewards from sustainability than directing our gaze into the organisation that gave birth to the SDGs themselves and, since its inception, has promoted international cooperation focused on economic, social, and environmental progress: the United Nations. The key was to find a correspondence between the values SL Benfica aspired to achieve and the practices the UN and its SDGs incentivised. This was accomplished by developing tailored practical implementations congruent with the UN's SDGs, which could also serve as the core of SL Benfica's sustainability strategy. Furthermore, after uncovering that the UN had already come up with initiatives such as the *Sports for Climate Action* and *Football for the Goals* frameworks, primarily intended for sports institutions such as SL Benfica, it was now imperative to understand how the proposed implementations could help the club integrate these initiatives, and what requirements and benefits to expect from them.

In a nutshell, this research revolved around the SDGs established by the United Nations, which in turn created official frameworks that could help sports organisations pursue them. Such frameworks are the S4CA and F4TG, representing a unique opportunity for SL Benfica to be

at the forefront of sustainable sports. This can open the door for a future where sustainability can drive future company prosperity, and SL Benfica can be more deeply connected with officially recognised institutions that can sustainably add value to its operations. It is also worth noting that based on the premise that the Benfica Foundation had already become an F4TG member, the research's main query became more centred around analysing S4CA's goals and benefits, where SL Benfica is not present.

The issue now revolved around the proposal to integrate SL Benfica into these programs, which stated that clubs should pursue a more explicit strategy based on transparently measuring and estimating future outcomes of its social and environmental practices, all elements of the previously proposed implementations. However, before these implementations could be made, a thorough analysis of SL Benfica's place within Portuguese sports' SP efforts was conducted, concluding that even though the club can be considered the Portuguese sports club with the most influential SPs, three problems remained: lack of transparency, lack of awareness, and rivals catching up. Even though ECO Benfica is well organised, there seems to be a lack of transparency about SPs, namely the lack of sustainability reports available to the broader public and the lack of specificity about the SPs' impacts on the club's overall carbon footprint. Furthermore, fans overall do not seem to know that SL Benfica is the Portuguese club with the most environmentally focused SPs in place today, something that can be attributed to the lack of marketing by SL Benfica itself. Finally, even though Sporting CP and FC Porto are not yet at SL Benfica's level regarding their SPs, they seem to have very structured plans to tackle these issues soon, leaving SL Benfica behind if no further actions are taken. This is where this project's proposed implementations could come in handy. These implementations have undergone cost/benefit analysis, enabling the club's SPs to face the recent needs associated with climate action and society's well-being and financially benefit from them nonetheless.

For a club like SL Benfica to be associated with such a recognised brand as the S4CA, three well-established requirements must be respected. Firstly, Benfica needs to have one mid-term target to reduce GHG emissions by 50% by 2030. Secondly, Benfica needs to have one long-term target to reach net zero GHG emissions by 2040, considering scope emissions one to three. Benfica must also have established committing, planning, proceeding, and reporting processes. Even though these are the main requirements to enter, they are not the only ones. If SL Benfica is serious about joining the organisation, it must also abide by S4CA's principles: promoting greater environmental responsibility, reducing overall climate impact, advertising climate change education, promoting responsible and sustainable consumption, and facilitating communication towards climate change responses.

In this context, one way to achieve a competitive advantage with sustainable commitment is to bet on the digital segment within the club. The previously proposed "Sustainability League" fits perfectly as a potential medium to short-term strategic move that can benefit the club at all levels, sustainability included. This initiative allows Sport Lisboa e Benfica to have a more thorough overview of its environmental/social contributions, quantifying or qualifying them practically and effectively. In addition, since fans are inevitably responsible for a large part of the Scope 3 emissions of sports organisations, the objective of evaluating and minimising this type of emissions, encouraged by the S4CA framework, would also be achieved. As proven, SL Benfica should seek to adapt to the current digital transformation era, capitalising on the influence that gamification can have along with the current diverse consumer culture of fantasy leagues; thus, betting on introducing the "Sustainability League" brings all these worlds together. By acting as an incentive for supporters to carry out proposed activities by the club, it would be a decision that would not only have a positive impact internally but also be beneficial to all stakeholders, whether these are the partners who help make the initiative a reality or the fans themselves. The league, an additional feature in the Benfica Official App, would

complement all the ongoing sustainable contributions of the ECO Benfica program or the social actions promoted by the Benfica Foundation. Additionally, the several fan-focused participatory actions carried out by league participants to earn points would primarily translate into financial, social, and environmental returns for the club, as evidenced before. These impacts will be particularly relevant and will certainly make a significant contribution in the context of the United Nations Sustainable Development Goals, primarily SDGs 2, 3, 7, 11, 12, 13, 15, and 17, above and beyond all the others reported.

The opportunity for Benfica to have its stadium certified as a green building is also connected with mobility strategies and could prove to be another effective medium-term strategy to achieve S4CA requirements. A green building certification would require the club to review the stadium's operations in various areas, such as energy and water consumption, waste management, transportation of building occupants, and many more. Essentially, it would impart to the organisation a holistic understanding of the venue's functioning and allow a more informed approach to then implement sustainable initiatives that would optimise the operations. This operational optimisation approach of a green building certification brings various returns: savings in operational and maintenance costs, mainly connected to energy and water savings; health benefits such as reduced signs of "sick building syndrome" symptoms and lower levels of stress and depression; increased performance of building users; and better employee retention, due to increased job satisfaction. For SL Benfica, the most adequate certification to follow would be LEED, provided by the USGBC, since it is the most recognised in the world. This certification would transfer this recognition towards the club, hence taking the most out of other advantages of green building certifications, which enhance an organisation's green brand image and serve as a signal of a well-managed company to the corporate world.

Achieving a LEED certification would allow Benfica to standout not only in Portugal as the first sports venue with a green building certification but also as one of the first in European

football, and possibly the first stadium in Europe with such an award, if LEED Gold or Platinum levels are achieved. Additionally, this opens up the opportunity to market the stadium as the greenest football stadium in Portugal, which could be the building block of a strategy to assert Benfica as the greenest football club in the country. The image benefits from such endeavours would only be highlighted with the 2030 FIFA World Cup, requiring all stadiums to have some green building certification approved by FIFA.

The financial valuation performed for this project corroborates the findings around the value-adding characteristics of green building certifications. Although it is a rough estimate, based on many assumptions, a project that can generate millions in savings ought not to be overlooked by any organisation, especially when you add the capabilities of serving as a blueprint to build a concise corporate sustainability strategy and as a brand image enhancer.

Another way of achieving sustainability on a massive scale is through mobility strategies on matchdays, which offers the club and its stakeholders a more efficient perspective on mobility. Although a more long-term approach, this practical implementation could also prove useful if the club was to pursue S4CA entrance. This research emphasised three interconnected objectives: mitigating carbon emissions, promoting fan engagement, and strengthening the club's brand and financial position. This directly corresponds to SDGs 13, 11, and 17. The primary objective of this particular implementation was to assess the possible reductions in carbon emissions that may be achieved by adopting environmentally friendly transportation options. Concurrently, the study also assessed the qualitative dimensions of sustainable mobility, examining its impact on fan satisfaction and loyalty. In order to establish a thorough and practical comprehension of the corresponding costs and benefits, this research also resorted to professional assumptions when necessary due to a lack of data. The analysis examines the temporal dynamics associated with adopting sustainable mobility methods, considering short-term, medium-term, and long-term perspectives.

The scope of the research is broadened to investigate potential opportunities for external collaboration and financial assistance. Tackling SDG 17, the discussion is around the potential for securing sponsorships from environmentally aware companies, forming alliances with environmental groups to enhance the effectiveness of sustainability projects, and attracting investors who share a dedication to eco-friendly methods. This research endeavours to comprehensively analyse the financial environment, offering Benfica practical and applicable knowledge that goes beyond short-term benefits, promoting long-term viability and adaptability.

In the context of the appliance for the S4CA and F4TG, and jointly with the pursue of a LEED certification, digital innovation, and mobility modernization, Benfica can also indulge in some type of waste management initiatives. There are two specific initiatives that were selected as critical ones for Benfica's future focus: recycled stadium seating and reusable cups strategies. Both these strategies target specifically the reduction in plastic consumption and consequently the amount of plastic being wasted. By implementing these strategies Benfica will not just become a more sustainable enterprise but will also become more financially viable club since these projects are expected to have a positive net present value. Both these strategies are aligned with the UN SDGs 9 and 12, specifically the targets 9.4, 12.2, 12.4, 12.5 and 12.6. This strengthens the connection between these strategies and the two UN initiatives S4CA and F4TG.

Benfica needs to make sustainable progress, and the best way to do it is through partnerships, here we suggested that Benfica expands the existing relationship with Adidas and creates new partnerships, and Patagonia emerged as the new partnership with most potential value for the club. Adidas is perceived as the fourth most sustainable brand in the world and Patagonia is perceived as the number one, so these would be valuable brands that would push the Benfica brand up in the sustainability world. The perception is as important as the actions, and one could

even argue what's the point of implementing all the suggested strategies if the perception remains unchanged, as seen by the fact that most people don't even know SL Benfica is the SP leader in Portuguese sports today.

Implementing a variety of strategies in so many different fronts will not be an easy task, and might be very challenging to manage, measure and keep all suggestions aligned, this is why it is crucial for enterprises to have management tools and specifically for this field, an ESG management tool. Both tools suggested, Aplanet and GreenPlat, are ESG management tools that not only help with the management and measuring of the strategies and the club but also use an Artificial Intelligence algorithm to suggest next steps for specific targets. This would help Benfica immensely in managing existing initiatives and strategizing what steps to take next.

Football for the Goals is another initiative launched by the UN, but this one is focused on the football industry, as opposed to S4CA, which focuses on the whole sports industry. The requirements to enter F4TG compared to the requirements to enter S4CA are much more subjective and not well established. Essentially, SL Benfica must have sustainability practices in line with the United Nations' SDGs, support human rights and equality, and climate change mitigation measures, all of which are present in the implementations this project suggests. The Benfica Foundation is already a member of the F4TG initiative, working mainly on supporting human rights and equality. That being said, it would only prove beneficial for the club itself to join the initiative as well, something that can easily be achieved given the club's standing as the Portuguese leader in SPs, and even more so if the particular implementations here suggested are considered.

With this in mind, joining the S4CA and F4TG initiatives enables players within the sports industry to exercise real-world impacts and demonstrate that they are doing their part in addressing global climate change. Principally, the initiatives steer sports organisations towards

minimising their massive carbon emissions, something present in any of today's industries. In this respect, the reduction that the UN has tried to accomplish should consist of pragmatic steps and quantifiable achievements by the clubs participating in these initiatives. Perhaps the most obvious of these advantages comes in the form of the club's demonstration of environmental responsibility and sustainability concerns to the broader public. It is evident that by adhering to official UN sustainability frameworks, SL Benfica can showcase its dedication to environmental preservation, augmenting the club's public perception and building the image of an institution committed to social responsibility. It is also worth noting that, as previously stated, sports fans share a special bond with their respective sports teams (Maderer, Holtbruegge, and Woodland 2016), and if their club engages in SPs, it will not take long for them to adopt this mindset as well. For example, the NBA, one of the first signers of the UN's S4CA initiative, noted that introducing supporters in sustainable operations proved highly beneficial. In fact, the organisation developed "NBA Green", a platform dedicated to influencing fans to adopt eco-friendly practices (NBA 2023). The NBA ensured that its "NBA Green" campaign and community outreach were mainly oriented towards effective recycling and conserving energy (Colon 2023).

Adopting energy-efficient and sustainable practices also has the potential to result in financial benefits for the club. Implementing strategies such as energy saving, waste reduction, and sustainable procurement can yield long-term cost reductions in operational activities. Subsequently, Arsenal Football Club has been a trailblazer in environmental activities, starting with the fact that it was the first Premier League club to sign up for the UN's *Sports for Climate Action*. The club added water dispensers to all facilities as part of the strategic moves, saving nearly 150,000 single-use bottles annually (United Nations 2021). Furthermore, Arsenal FC installed automated LED lighting to cut operational costs, thus enhancing financial viability. One other benefit of implementing sustainable initiatives is the potential to attract dedicated

and environmentally concerned supporters and garner support from sponsors and partners that value and endorse such practices. Consequently, these efforts contribute to enhancing the club's brand overall. For example, AELTC, the organiser of the Wimbledon Championship, also joined the *Sports for Climate Action* Initiative in 2019 (Wimbledon n.d.) and agreed on a long-term partnership with Evian to make Wimbledon environment-friendly by 2030 (Carp 2023). An on-court refillable system with reusable bottles for players is already in place. Also, underpinning publicly its culture of consciousness and caring for the environment, Evian launched a recycle-at-Wimbledon program in 2022 and even a year earlier introduced recycling bins into the town centre, demonstrating its intention to be a circular brand by 2025. As proven, through the implementation of sustainable practices, a sports organisation has the potential to positively impact the overall welfare of communities and engage with fans towards climate change while also serving as a role model for supporters and other neighbouring corporations. La Liga side Atlético de Madrid, through the Atlético de Madrid Foundation, sets the standard of how a club's sustainable initiatives can have this effect on surrounding communities. In 2022, its campaign *"Limpieza de Mares Interiores"*, in partnership with WhaleFin, began with the objective of removing and classifying all human-generated waste from rivers, streams, and swamps from Madrid municipalities (Atlético de Madrid 2022). Since its inception, this project has outgrown the initial target area of Madrid, and its focus has spread into "inland seas" all over Spain, raising awareness about the importance of preserving these ecosystems (Atlético de Madrid 2023a). Additionally, from the start of the 2023/24 season, the reach increased again to the waters of the Spanish coast due to an alliance with Coca-Cola and its campaign *"Mares Circulares".* The initiative counts on the collaboration of first-team and academy players, club workers and members, as well as students and residents from affected areas. As a joint project with Coca-Cola, the first expedition removed up to 96 kilograms of waste from water ecosystems (Atlético de Madrid 2023b). Another example, previously mentioned, is the non-

profit division of Forest Green Rovers FC, which is called FGR Community. This division collaborates with the registered charitable organisation *Green Britain Foundation*, educational institutions, community organisations, and sports teams in the Gloucestershire region and surrounding areas (Forest Green Rovers n.d.). Their primary objective is to impart knowledge, provide assistance, and foster engagement among individuals via football. At the FGR Community, activities are delivered around the primary subject of sustainability. The firm operates in an environmentally conscious manner and conveys knowledge on sustainability to individuals within the surrounding region. As an effect, the FGR Community is actively addressing the climate crisis by implementing an education program that serves as a valuable tool in mitigating environmental challenges. According to the same source, the group also engages in knowledge-sharing activities such as green energy and the preparation of vegetarian cuisine. S4CA and F4TG could also pave the way for the club to exhibit its leadership capabilities internationally. This means having the potential to get noticed and garner respect from fans, stakeholders, and other sports organisations on a global scale. Recently, Southampton Football Club – the latest Premier League club to join UN's *Sports for Climate Action* Framework – announced its "The Halo Effect" sustainability strategy. Chief Legal and Risk Officer Tim Greenwell underscored the importance of leveraging the club's platform to propel positive change toward a more sustainable future (Southampton Football Club 2021). The institution's commitment is evident in a holistic strategy that envisions offsetting up to 3,000 tonnes of CO_2 emissions in the next four years (Edgley 2021). Additionally, the club has promised to plant 250 trees for each first-team debutant from the academy, representing its sustainable development on and off the pitch. S4CA also serves as a reputational driver that resonates with stakeholders and eventually draws like-minded sponsors and partners. Hence, by its engagement in these United Nations initiatives, Benfica not only addresses the SDGs but

also stands to gain economic benefits and embrace wider aspects of brand development, community engagement, and financial sustainability.

In conclusion, as a starting point for this project, theoretical evidence was provided to sustain the hypothesis that sustainability can significantly benefit organisations in general, especially for sports enterprises such as SL Benfica. That being said, countless practical examples of sports organisations where sustainability had a positive impact were also provided, especially of those who joined the two sports-related official UN frameworks mentioned previously.

8. Conclusions and Recommendations

As evidenced throughout this work project, sustainability is one of the most important concepts to implement if human beings are to continue their "business as usual" for the foreseeable future: its environmental, social, and economic implications are far too impactful not to be addressed. The UN's Sustainable Development Goals mark the forefront of sustainability, but although this blueprint has been a critical introduction in the push for worldwide cooperation, the UN has reported the progress towards their achievement as very underwhelming. The ever more pressing issue requires everyone's cooperation and all-around contribution, including businesses, who should look at sustainability and see more than just bureaucratic obligations to meet, realising its massive potential. The literature review shows empirical evidence of the countless benefits organisations can reap if sustainability is pursued. From aligning and correlating organisational strategy with higher management quality to reducing financial risk and improving operational efficiency, one thing is clear: sustainability creates corporate value and long-term success.

Within sports, the studied impact of the industry has been proven to be substantial, especially when it comes to the environmental impact of large sports events, which are responsible for moving large masses of people. Moreover, literature has also shown that progress has been lacklustre and that sports organisations, particularly in football, are missing out on using the power of fans to promote sustainable behaviours and create a more attractive identity. For SL Benfica, this represents an opportunity to develop a strategy that reinforces its leading position against its rivals in sustainability initiatives and fan base. This position is backed by the study performed regarding the role of the club within sustainability, which demonstrates that the ECO Benfica strategy has managed to keep it ahead of its rivals. However, as shown, ECO Benfica's advantage over rivals' strategies is slim and lacks transparency and communication to the public, which must be improved. Primarily, the strategy should use the club's sizeable and loyal

fan base and access to sponsors to take advantage of the rival's slow pace of action in this field and the growth of the sustainability market. A successful implementation could see SL Benfica rise as one of the leading Portuguese organisations in sustainability regardless of the industry. To structure its strategy, SL Benfica should join the UN's initiatives *Sports for Climate Action* and *Football for the Goals* (and not only the Benfica Foundation), as they were developed to guide sports organisations towards set sustainability targets, are aligned with the SDGs, and require the club to outline a cohesive plan of action.

To achieve these goals, it is recommended that SL Benfica use the "Sustainability League" initiative to qualify and quantify its social and environmental impact, leveraging its large mass of fans to minimise the significant scope 3 emissions of the club while simultaneously bringing in financial returns. In addition, to reinforce the promotion of fan engagement, the strengthening of the club's brand, and mitigating carbon emissions, with emphasis on scope 3, SL Benfica should look to implement sustainable mobility strategies for matchdays that offer alternative transportation solutions associated with different temporal dynamics. These solutions open the door to new sponsorship and partnership opportunities and bring financial improvements to the club's operations. From another angle, SL Benfica should consider retrofitting the stadium to meet the LEED rating system's requirements. Simultaneously, it improves the club's image by certifying its main building as a green building, thus providing an opportunity to market it as the greenest football stadium in Portugal, and the club's financial situation since the operational and maintenance savings are very significant. Even if the club does not obtain the LEED certification, the club can use the rating system as an operational efficiency optimisation framework.

9. Bibliography

Accenture. 2021. “Almost One-Third of Europe’s Largest Listed Companies Have Pledged to Reach Net-Zero by 2050 Accenture Study.” *Newsroom Accenture*, October 7, 2021. https://newsroom.accenture.com/news/almost-one-third-of-europes-largest-listed-companies-have-pledged-to-reach-net-zero-by-2050-accenture-study-finds.htm?utm_source=pocket_mylist.

Accenture. 2022. “Companies Have Unprecedented Opportunity to Transform How They Manage, Measure and Report the Impact and Value of Their ESG Priorities, Accenture Report Finds.” Newsroom Accenture. January 20, 2022. https://newsroom.accenture.com/news/2022/companies-have-unprecedented-opportunity-to-transform-how-they-manage-measure-and-report-the-impact-and-value-of-their-esg-priorities-accenture-report-finds.

Aras, Güler, and David Crowther. 2012. *Business Strategy and Sustainability*. Website. 1st ed. Vol. 3. Emerald Group Publishing Limited. https://research.ebsco.com/linkprocessor/plink?id=32b3f900-5d17-3e20-924e-34f3d3ffca7a.

Athletic Club. 2016. “First Stadium with LEED Certification.” *Athletic Club*, April 30, 2016. Accessed November 10, 2023. https://www.athletic-club.eus/en/news/2016/05/01/first-stadium-with-leed-certification.

Athletic Club. 2023. “San Mames and Its Architecture: A Magnificent Stadium.” Athletic Club - San Mamés. Accessed November 10, 2023. https://sanmames.athletic-club.eus/en/blog/san-mames-architecture-stadium-bilbao/

Atlético de Madrid. 2022. “Impulsamos, junto a WhaleFin, la campaña ‘Limpieza de Mares Interiores.’” Fundación Atlético De Madrid. October 24, 2022. Accessed November 20, 2023. https://www.atleticodemadrid.com/noticias/impulsamos-junto-a-whalefin-la-campana-limpieza-de-mares-interiores.

Atlético de Madrid. 2023a. “Enrique Cerezo comprobó la evolución del proyecto ‘Limpieza de Mares Interiores.’” Fundación Atlético De Madrid. August 31, 2023. Accessed November 20, 2023. https://www.atleticodemadrid.com/noticias/enrique-cerezo-comprobo-la-evolucion-del-proyecto-limpieza-de-mares-interiores.

Atlético de Madrid. 2023b. “La Fundación impulsa la Limpieza de Mares Interiores en Manzanares el Real.” Fundación Atlético De Madrid. October 3, 2023. Accessed November 20, 2023. https://www.atleticodemadrid.com/noticias/la-fundacion-impulsa-la-limpieza-de-mares-interiores-en-manzanares-el-real.

Atz, Ulrich, Tracy Van Holt, Elyse Douglas, and Tensie Whelan. 2020. “The Return on Sustainability Investment (ROSI): Monetizing Financial Benefits of Sustainability Actions in Companies.” Website. In *Sustainable Consumption and Production*, 1st ed., II:303–54. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-55285-5_14.

Barney, Jay B. 2000. *Firm Resources and Sustained Competitive Advantage*. Website. *Economics Meets Sociology in Strategic Management*. Vol. 17. Emerald Group Publishing Limited. https://doi.org/10.1016/S0742-3322(00)17018-4.

Bartolacci, Francesca, Andrea Caputo, and Michela Soverchia. 2019. *Sustainability and Financial Performance of Small and Medium Sized Enterprises: A Bibliometric and Systematic Literature Review*. Website. *Business Strategy and the Environment*. 3rd ed. Vol. 29. ERP Environment and John Wiley & Sons Ltd. https://doi.org/10.1002/bse.2434.

Bateh, Justin, Camille Heaton, Gordon W. Arbogast, and Ardell Broadbent. 2014. "Defining Sustainability In The Business Setting". *Journal of Sustainability Management (JSM)* 1 (1):1-4. https://doi.org/10.19030/jsm.v1i1.8386.

Beiderbeck, Daniel, Nicolas Evans, Nicolas Frevel, and Sascha L. Schmidt. 2023. "The Impact of Technology on the Future of Football – A Global Delphi Study." *Technological Forecasting and Social Change* 187 (February). https://doi.org/10.1016/j.techfore.2022.122186.

Belsie, Laurent. 2012. "Who Makes Financial Decisions within Private Companies?" *National Bureau of Economic Research*, January 2012. Accessed October 30, 2023. https://www.nber.org/digest/jan12/who-makes-financial-decisions-within-private-companies.

Berns, Maurice, Andrew Townend, Zayna A. Khayat, Balu Balagopal, Martin Reeves, Michael S. Hopkins, and Nina Kruschwitz. 2009. "The Business of Sustainability: What It

Means to Managers Now." MIT Sloan Management Review 51 (1): 20–26. https://dialnet.unirioja.es/servlet/articulo?codigo=3121005.

Bertelsen, Beth. 2012. *Everything You Need to Know About SWOT Analysis*. [Newmarket, Ont.]: BrainMass Inc. Accessed November 9, 2020. https://research.ebsco.com/linkprocessor/plink?id=7a48b2ce-1fe9-3aa5-b5fb-8c29d4a2cb44.

Blankenbuehler, Marlene, and Michelle B. Kunz. 2014. "Professional Sports Compete to Go Green." *American Journal of Management* 14 (4). http://www.na-businesspress.com/AJM/BlankenbuehlerM_Web14_4_.pdf.

Brown, Maury. 2023. "Inside The Numbers That Show Formula 1's Popularity and Financial Growth." *Forbes*, March 29, 2023. https://www.forbes.com/sites/maurybrown/2023/03/29/inside-the-numbers-that-show-formula-1s-popularity-and-financial-growth/.

Browne, Nyanya. 2020. "LEED-Certified Buildings Lower Operating Expenses, Commands Higher Rents for Residential Units." Office of Revenue Analysis. December 2, 2020. Accessed November 1, 2023. https://ora-cfo.dc.gov/blog/leed-certified-buildings-lower-operating-expenses-commands-higher-rents-residential-units#:~:text=The%20study%20found%20that%20operating,buildings%20(see%20Figure%201).

Burns, Robert Irving. 2020. “Green Building Certification: What Is It and How Can Businesses Achieve It? - RIB New.” RIB. November 18, 2020. Accessed October 29, 2023. https://rib.co.uk/green-building-certification-what-is-it-and-how-can-businesses-achieve-it/.

Business Development Bank of Canada. n.d. “How a LEED Green Building Certification Can Help Your Business.” BDC. Accessed October 29, 2023. https://www.bdc.ca/en/articles-tools/sustainability/climate-action-centre/articles/how-leed-green-building-certification-can-help-your-business.

Cardoso, Sónia. 2023. “Nova Estratégia de Sustentabilidade Sonae.” Press release. October 12, 2023. https://www.sonae.pt/pt/media/blog/post/nova-estrategia-de-sustentabilidade-sonae/.

Carp, Sam. 2023. “Simulators, AI Commentary and Fortnite… What Wimbledon’s Sponsors Have Planned for the 2023 Championships.” SportsPro. July 3, 2023. https://www.sportspromedia.com/analysis/wimbledon-2023-sponsors-barclays-simulator-ibm-ai-amex-fortnite-evian-vodafone/?zephr_sso_ott=IQxIAB.

Charles Krautmann, Anthony, and David Berri. 2007. “Can We Find It at the Concessions?: Understanding Price Elasticity in Professional Sports.” *Journal of Sports Economics* 8 (2): 183–91. https://doi.org/10.1177/1527002505275093.

Cheung, Jane, Christopher Nowak, Catherine Fillare, Cristene Gonzalez-Wertz, Gillian Orrell, and Steven Peterson. 2022. “Balancing Sustainability and Profitability.” *IBM*, April 7, 2022.

https://www.ibm.com/thought-leadership/institute-business-value/en-us/report/2022-sustainability-consumer-research.

Chladek, Natalie. 2019. “The Importance of Sustainability in Business.” HBS Online. November 6, 2019. Accessed November 22, 2023. https://online.hbs.edu/blog/post/business-sustainability-strategies.

Chron. 2017. “Ten Reasons to Have a Sustainability Strategy.” Chron.Com. November 21, 2017. Accessed November 23, 2023. https://smallbusiness.chron.com/ten-reasons-sustainability-strategy-33027.html.

Colon, Bailey. 2023. “NBA Green: Dr. Allen Hershkowitz Leads Sustainability Efforts around the League.” NBA. April 22, 2023. Accessed September 29, 2023. https://www.nba.com/news/nba-green-dr-allen-hershkowitz-leads-sustainability-efforts-around-the-league.

Crowther, David, and Shahla Seifi. 2020. *Governance and Sustainability*. Website. 1st ed. Vol. 15. Emerald Publishing Limited. https://research.ebsco.com/linkprocessor/plink?id=e7111d62-b56c-321c-9906-3b63eeb782b3.

Dantas, Florbela, Ana Borges, and Rui Silva. 2020. “Impact of UEFA Champions League and UEFA Europa League on Financial Sustainability—Case Study of Two Small Football Portuguese Teams.” *Sustainability* 12 (21): 9213. https://doi.org/10.3390/su12219213.

Deloitte. 2022. “Deloitte 2022 CxO Sustainability Report.” *Deloitte*. https://www.deloitte.com/content/dam/assets-shared/legacy/docs/2022-deloitte-global-cxo-sustainability-report.pdf.

Deloitte’s Sports Business Group. 2023. “A Balancing Act: Annual Review of Football Finance.” *Deloitte*. Deloitte LLP. Accessed November 11, 2023. https://www2.deloitte.com/uk/en/pages/sports-business-group/articles/annual-review-of-football-finance-europe.html.

Delta Cafés. n.d. “A Nossa Sustentabilidade, o Nosso Futuro.” *Grupo Nabeiro*. Accessed October 23, 2023. https://gruponabeiro.com/app/uploads/2020/05/Relatorio_Sustentabilidade_2018.pdf.

Di Noto, Joe. 2023. “An Overview of Green Building Certifications (Video + Comparison Guide).” Kaiterra. April 24, 2023. Accessed October 28, 2023. https://learn.kaiterra.com/en/resources/an-overview-of-green-building-certifications-video-comparison-guide.

Donovan, James. 2020. “When It Comes to Sport, Is Sustainability Being Left on the Bench?” LinkedIn. April 17, 2020. Accessed November 16, 2023. https://www.linkedin.com/pulse/when-comes-sport-sustainability-being-left-bench-james-donovan/.

Edgley, Timothy. 2021. “Southampton FC Plant Trees for Academy Player’s Senior Debut.” *Daily Echo*, February 1, 2021. Accessed October 3, 2023.

https://www.dailyecho.co.uk/news/19053044.southampton-fc-plant-trees-academy-players-senior-debut/.

Empresa Portuguesa das Águas Livres. n.d. “Tarifários - Água.” EPAL - Grupo Águas De Portugal. Accessed November 13, 2023. https://www.epal.pt/EPAL/menu/clientes/tarif%C3%A1rio/%C3%A1gua.

Eurobarometer. 2022. “Eurobarometer: EU SMEs Working towards Sustainability.” Internal Market, Industry, Entrepreneurship and SMEs. March 28, 2022. Eurobarometer: EU SMEs working towards Sustainability (europa.eu).

Expresso. 2022. “Energia: Portugal nunca instalou tanta capacidade solar como em 2021.” *Jornal Expresso*, February 1, 2022. Accessed September 30, 2023. https://expresso.pt/economia/2022-02-01-energia-portugal-nunca-instalou-tanta-capacidade-solar-como-em-2021.

Farrell, Matthew. 2019. “A Brief History (And Defense) of VAR.” Soccer Politics / the Politics of Football. April 1, 2019. Accessed October 4, 2023. https://sites.duke.edu/wcwp/2019/04/01/a-brief-history-and-defense-of-var/.

FIFA. 2022. “Another Way: The Forest Green Rovers Story.” *FIFA*, October 6, 2022. https://www.fifa.com/fifaplus/en/articles/forest-green-rovers-environment-green-league-one-dale-vince.

Fish, Hal. 2023. “Which Clubs Have Made the Most Money in the Transfer Market in Last 10 Years?” GiveMeSport. September 5, 2023. Accessed October 16, 2023. https://www.givemesport.com/ranking-clubs-made-the-most-money-in-the-transfer-window-last-10-years/#atalanta-bc---pound-151-36m.

Focus Group. n.d. “Sport Lisboa e Benfica Stadium.” Accessed November 3, 2023. https://www.focusgroup.eu/estadioslb?lang=en.

Forest Green Rovers. n.d. “Another Way.” *Forest Green Rovers*. https://www.fgr.co.uk/another-way.

Forest Green Rovers. n.d. “FGR Community.” *Forest Green Rovers*. Accessed November 20, 2023. https://www.fgr.co.uk/fgr-community.

Fowler, Kim, Emily Rauch, Jordan Henderson, and Angela Kora. 2011. “Re-Assessing Green Building Performance: A Post Occupancy Evaluation of 22 GSA Buildings.” PNNL-19369. *Pacific Northwest National Laboratory*. Pacific Northwest National Laboratory. Accessed November 1, 2023. https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-19369.pdf.

Gaboleiro, Ana. 2023. “Estas são as empresas mais responsáveis em Portugal.” Imagens De Marca. March 28, 2023. Accessed September 24, 2023. https://www.imagensdemarca.pt/artigo/estas-sao-as-empresas-mais-responsaveis-em-portugal/.

Galpin, Timothy, Lee Whittington, and Greg Bell. 2015. “Is Your Sustainability Strategy Sustainable? Creating a Culture of Sustainability.” *Corporate Governance* 15 (1): 1–17. https://doi.org/10.1108/CG-01-2013-0004.

Global Sustainable Sport. 2023. “How Sustainable Is Sport?” January 24, 2023. https://www.globalsustainablesport.com/how-sustainable-is-sport/.

Goldblatt, David. n.d. “Understanding Sports’ Carbon Emissions.” PlaytheGame. Accessed October 27, 2023. https://www.playthegame.org/themes/sport-and-climate-change/understanding-sports-carbon-emissions/.

Grupo Nabeiro. 2021. “Comunidades.” March 5, 2021. Accessed October 21, 2023. https://gruponabeiro.com/sustentabilidade/comunidades.

Grupo Nabeiro. 2021a. “Planeta.” March 5, 2021. Accessed October 21, 2023. https://gruponabeiro.com/sustentabilidade/planeta.

Grupo Nabeiro. 2021b. “Sustentabilidade.” March 11, 2021. Accessed October 21, 2023. https://gruponabeiro.com/sustentabilidade.

Gürel, Şadiye, and Merba Tat. 2017. “SWOT ANALYSIS: A THEORETICAL REVIEW.” The Journal of International Social Research 10 (51): 994–1006. https://doi.org/10.17719/jisr.2017.1832.

Hansen, Tony, and Yvon Chouinard. 2023. “Patagonia Shows How Turning a Profit Doesn’t Have to Cost the Earth.” McKinsey & Company. April 20, 2023. https://www.mckinsey.com/industries/agriculture/our-insights/patagonia-shows-how-turning-a-profit-doesnt-have-to-cost-the-earth.

Harrison, Virginia S., Michail Vafeiadis, and Joseph Bober. 2022. “Greening Professional Sport: How Communicating the Fit, Proximity, and Impact of Sustainability Efforts Affects Fan Perceptions and Supportive Intentions.” *Sustainability* 14 (6). https://doi.org/10.3390/su14063139.

Hedstrom, Gilbert S. 2018. *Sustainability: What It Is and How to Measure It*. Website. Walter de Gruyter Inc. https://research.ebsco.com/linkprocessor/plink?id=2b0eecd2-1061-3508-8fee-1ff6d4da869f.

Heeren, Niko, Christopher L. Mutel, Bernhard Steubing, York Ostermeyer, Holger Wallbaum, and Stefanie Hellweg. 2015. “Environmental Impact of Buildings—What Matters?” *Environmental Science & Technology* 49 (16): 9832–41. https://doi.org/10.1021/acs.est.5b01735.

Henczel, Tayllor. 2021. “The Environmental Impact Of Professional Sports.” The Environmentor. April 20, 2021. https://blog.tentree.com/the-environmental-impact-of-professional-sports/.

Hughes, Kealan. 2023. “Kings of Transfer Market in 21st Century Revealed with 15 Clubs Earning £5.1BILLION in Profit.” *The Sun*, September 5, 2023. Accessed October 9, 2023. https://www.thesun.co.uk/sport/23800706/transfer-profit-benfica-porto-ajax-felix-pepe/.

Iberdrola. n.d. “Green or Sustainable Buildings.” Accessed October 16, 2023. https://www.iberdrola.com/sustainability/sustainable-green-buildings.

Indeed, ed. 2022. “38 Green Certifications for Companies (And Their Benefits).” June 25, 2022. Accessed October 29, 2023. https://www.indeed.com/career-advice/career-development/green-certifications.

Inoua, Sabiou M., and Vernon L. Smith. 2023. “The Classical Theory of Supply and Demand.” *arXiv (Cornell University)*, July. https://doi.org/10.48550/arxiv.2307.00413.

International Olympic Committee. 2019. “NOC and IF Sustainability Project: *Sports for Climate Action*.” Press release. 2019. https://theuiaa.org/documents/Sustainability/IOC-SPORTS-FOR-CLIMATE-ACTION.pdf.

Jain, Kushal. 2023. “Understanding Green Building Certifications for Existing Buildings in Germany.” LinkedIn. October 22, 2023. Accessed October 28, 2023. https://www.linkedin.com/pulse/understanding-green-building-certifications-existing-buildings-jain/?utm_source=rss&utm_campaign=articles_sitemaps&utm_medium=google_news.

Joyner, Jeffrey. 2017. “Ten Reasons to Have a Sustainability Strategy.” Chron. November 21, 2017. Accessed November 23, 2023. https://smallbusiness.chron.com/ten-reasons-sustainability-strategy-33027.html.

Kaminsky, Andrew. n.d. “The Top 3 Ways That Sport Impacts Our Environment.” Sport and Sustainability International. Accessed October 26, 2023. https://www.sportsustainability.org/news-events/the-top-3-ways-that-sport-impacts-our-environment.

Knowledge at Wharton. 2013. “Reducing Sports’ Impact on the Environment.” December 13, 2013. Accessed October 27, 2023. https://knowledge.wharton.upenn.edu/article/reducing-sports-impact-environment/.

Kolk, Ans, and Jonatan Pinkse. 2008. “A Perspective on Multinational Enterprises and Climate Change: Learning from ‘an Inconvenient Truth’?” *Journal of International Business Studies* 39 (August): 1359–78. https://doi.org/10.1057/jibs.2008.61.

Kriss, Jacob. 2014. “What Is Green Building?” USGBC. August 6, 2014. Accessed October 16, 2023. https://www.usgbc.org/articles/what-green-building.

Kronenberg, Kasper. 2023. “Benfica adjust their international strategy – talented American footballers will be a future cornerstone” Off the Pitch. May 8, 2023. Accessed October 18, 2023. https://offthepitch.com/a/benfica-adjust-their-international-strategy-talented-american-footballers-will-be-future?check_logged_in=1.

Laricchia, Federica. 2023. “Green Technology and Sustainability Market Size 2022-2030.” Statista. July 21, 2023. Accessed October 2, 2023. https://www.statista.com/statistics/1319996/green-technology-and-sustainability-market-size-worldwide/.

Leigh, Doug. 2010. *SWOT Analysis*. Website. *Handbook of Improving Performance in the Workplace: Selecting and Implementing Performance Interventions*. Vol. 2. International Society for Performance Improvement. https://doi.org/10.1002/9780470587102.ch5.

Linstroth, Tommy. 2023. “Three Reasons To Consider Green Building Certification In Your Business’ Next Buy Or Build.” *Forbes*, January 10, 2023. Accessed October 14, 2023. https://www.forbes.com/sites/forbesbusinesscouncil/2023/01/10/three-reasons-to-consider-green-building-certification-in-your-business-next-buy-or-build/?sh=331b5e8e56c4.

Lockwood, David, and Matt Warwick. 2022. “Qatar World Cup: Fifa’s Carbon Neutrality Claim ‘Misleading and Incredibly Dangerous.’” BBC Sport. November 2, 2022. https://www.bbc.com/sport/football/63466168.

Lojaluz. n.d. “Preço kWh Eletricidade e Gás Das Fornecedoras.” Accessed November 13, 2023. https://lojaluz.com/faq/preco-kwh.

Long, Michael. 2022. “‘Our Partnership Revenue Grew Fivefold in Three Years’: Sports Sustainability Experts Make the Business Case for Carbon Reduction.” *SportsPro*, May. https://www.sportspromedia.com/interviews/sports-Sustainability-business-case-carbon-reduction-forest-green-right-

formula/?zephr_sso_ott=NgbKrC#:~:text=Many%20professional%20and%20grassroots%20sports,stakeholders%20to%20reduce%20emissions%20in.

Lozano, Rodrigo, María Barreiro-Gen, and Afnan Zafar. 2021. "Collaboration for Organisational Sustainability Limits to Growth: Developing a Factors, Benefits, and Challenges Framework." *Sustainable Development* 29 (4): 728–37. https://doi.org/10.1002/sd.2170.

Lusa and Diário De Notícias. 2023. "Benfica foi o sétimo clube que mais investiu no atual plantel fora das 'big 5.'" *DN*, September 13, 2023. Accessed December 8, 2023. https://www.dn.pt/desporto/benfica-foi-o-setimo-clube-que-mais-investiu-no-atual-plantel-fora-das-big-5-17016288.html.

Macedo, Cristiana. 2019. "Delta Cafés assume compromissos sustentáveis e lança primeira cápsula 100% biodegradável." Ambiente Magazine. May 16, 2019. Accessed October 20, 2023. https://www.ambientemagazine.com/delta-cafes-assume-compromissos-sustentaveis-e-lanca-primeira-capsula-100-biodegradavel/.

Maderer, Daniel, Dirk Holtbruegge, and Rachel Woodland. 2016. "The Impact of Brand Associations on Brand Loyalty in the Football Industry: A Comparison of Fans from Developed and Emerging Football Markets." *Sports, Business, and Management* 6 (5): 499–519. https://doi.org/10.1108/SBM-06-2016-0026.

Mariotti, Tony. 2023. "Green Building Statistics (2023)." *Ruby Home Luxury Real Estate* (blog). September 11, 2023. Accessed October 29, 2023.

https://www.rubyhome.com/blog/green-building-stats/#:~:text=Key%20Green%20Building%20Statistics,-According%20to%20the&text=Building%20green%20typically%20can%20cost,new%20green%20buildings%20is%2010.5%25.

MarketScreener. 2023. “Sport Lisboa e Benfica-Futebol : Aktionäre Vorstände Geschäftsführer und Unternehmensprofil | A0MSP7 | PTSLB0AM0010 | MarketScreener.” Accessed October 15, 2023. https://de.marketscreener.com/kurs/aktie/SPORT-LISBOA-E-BENFICA-FU-51092/unternehmen/.

Maryville University. 2019. “The Importance of Environmental Awareness When Running a Business.” Maryville Online. July 18, 2019. https://online.maryville.edu/blog/importance-of-environmental-awareness-when-running-a-business/.

McCullough, Brian P. 2020. “Do Sports Teams’ Sustainability Efforts Matter to Fans?” The Conversation. https://theconversation.com/do-sports-teams-Sustainability-efforts-matter-to-fans-147171.

McCullough, Brian, and Timothy Kellison. 2016. “Go Green for the Home Team: Sense of Place and Environmental Sustainability in Sport.” *Journal of Sustainability Education* 11 (2): 1–14. https://scholarworks.gsu.edu/cgi/viewcontent.cgi?article=1044&context=kin_health_facpub.

Melović, Boban, Sunčica Rogić, Julija Cerović Smolović, Branislav Dudic, and Michal Greguš Ml. 2019. “The Impact of Sport Sponsorship Perceptions and Attitudes on Purchasing

Decision of Fans as Consumers—Relevance for Promotion of Corporate Social Responsibility and Sustainable Practices." *Sustainability* 11 (22): 6389. https://doi.org/10.3390/su11226389.

Merrill, Annie. 2017. "Mercedes-Benz Stadium Becomes North America's First LEED Platinum Professional Sports Stadium." HOK. November 15, 2017. Accessed November 10, 2023. https://www.hok.com/news/2017-11/mercedes-benz-stadium-becomes-first-professional-sports-stadium-to-receive-leed-platinum-certification/.

Method Recycling. 2022. "Benefits of Green Building Certifications for Property Managers." August 4, 2022. Accessed October 29, 2023. https://methodrecycling.com/world/journal/benefits-of-green-building-certifications-for-property-managers.

Mil-Homens, Pedro. n.d. "Bem-vindos ao Benfica Campus." SL Benfica. November 10, 2023. https://www.slbenfica.pt/pt-pt/futebol-formacao/formacao/bem-vindo.

Mind Tools Content Team. n.d. "SWOT Analysis." Mind Tools. Accessed October 14, 2023. https://www.mindtools.com/amtbj63/swot-analysis.

Miranda, Jaime, Imme Scholz, John Agard, Kaltham Al-Ghanim, Sergey N. Bobylev, Opha Pauline Dube, Ibrahima Hathie, et al. 2023. "Global Sustainable Development Report 2023: Times of Crisis, Times of Change: Science for Accelerating Transformations to Sustainable Development." *United Nations*. New York, United States of America: United Nations. Accessed September 26, 2023. https://sdgs.un.org/sites/default/files/2023-09/FINAL%20GSDR%202023-Digital%20-110923_1.pdf.

Moustgaard, Nicolai. 2021. “Football Supporters Demand Sustainable Behaviour in Football Clubs.” LinkedIn. January 26, 2021. Accessed November 13, 2023. https://www.linkedin.com/pulse/football-supporters-demand-sustainable-behaviour-clubs-moustgaard/.

Muller, J. Christian, Joachim Lammert, and Gregor Hovemann. 2012. “The Financial Fair Play Regulations of UEFA: An Adequate Concept to Ensure the Long-Term Viability and Sustainability of European Club Football?” *International Journal of Sport Finance* 7 (2): 117+. Accessed November 11, 2023. https://go.gale.com/ps/i.do?p=AONE&u=googlescholar&id=GALE|A323349961&v=2.1&it=r&sid=bookmark-AONE&asid=b5331a80.

Muralidharan, Ashwin. 2023. “Benfica Most Expensive Player Sales - How SLB Made over €1.5 Billion in Outgoing Transfers.” Goal.Com US, August 3, 2023. Accessed September 8, 2023. https://www.goal.com/en-us/lists/joao-felix-darwin-nunez-benfica-1-billion-player-transfer-sales/blt2d8e0cf43c34b1af.

Murray, William. 2021. “Assessing and Reducing the Environmental Impact of the English Premier League.” MSc Thesis, University of Strathclyde. https://www.esru.strath.ac.uk/Documents/MSc_2021/Murray.pdf

National Australian Built Environment Rating System. n.d. “What Is NABERS?” NABERS. Accessed October 19, 2023. https://www.nabers.gov.au/about/what-nabers?utm_medium=website&utm_source=archdaily.com.

NBA. 2023. “NBA Green.” NBA Cares. September 13, 2023. Accessed October 11, 2023. https://cares.nba.com/programs/nba-green/.

Nidumolu, Ram, C.K. Prahalad, and M.R. Rangaswami. 2014. “Why Sustainability Is Now the Key Driver of Innovation.” Harvard Business Review. August 1, 2014. https://hbr.org/2009/09/why-sustainability-is-now-the-key-driver-of-innovation.

Noble, Josh, Barney Jopson, and Samuel Agini. 2023. “Spain, Portugal and Morocco to Host 2030 Football World Cup.” *Financial Times,* October 4, 2023. Accessed November 11, 2023. https://www.ft.com/content/3fce1dce-1819-497c-9281-f81a8ac896aa.

Normand, Chloé. 2022. “Sports & Environment: 17 Eco-Friendly Initiatives.” Sport Heroes. April 5, 2022. https://blog.sportheroes.com/environmentally-friendly-sports-initatives.

Nulli Rinalducci, Simone. 2023. “Environmental Responsibility Definition & EXAMPLE.” *Sustainability Success* (blog). December 30, 2023. https://sustainability-success.com/environmental-responsibility-examples/.

Observador. 2019. “Quase metade dos portugueses é do Benfica. Porto e Sporting em segundo e terceiro lugar.” *Observador,* November 2, 2019. Accessed October 29, 2023. https://observador.pt/2019/11/02/quase-metade-dos-portugueses-sao-do-benfica-porto-e-sporting-quase-empatados-em-segundo-lugar/.

Pacific Northwest National Laboratory. 2021. “Green Buildings.” PNNL. September 18, 2021. Accessed October 14, 2023. https://www.pnnl.gov/explainer-articles/green-buildings#:~:text=A%20history%20of%20green%20buildings,as%20more%20energy%2Defficient%20buildings.

Păun, Dan. 2023. “Many Facets of Football Sustained by Innovative Technology.” Website. In *Book of Abstracts*, 1st ed., 16:27–31. Faculty of Contemporary Arts Belgrade, Information Technology School, Institute for Contemporary Education. https://www.institut.edu.rs/wp-content/uploads/2023/05/Book-of-Abstracts_LINK_IT-EdTech23.docx.pdf.

Pompliano, Joe. 2023. “How Formula 1 Became the World’s Fastest Growing Sport.” *Huddle Up* (blog). May 8, 2023. https://huddleup.substack.com/p/how-formula-1-became-the-worlds-fastest.

Pusey, Oscar. 2022. “Football and Sustainability: How Is the World’s Favourite Sport Addressing the World’s Biggest Challenge?” Zero Carbon Academy. April 28, 2022. https://www.zerocarbonacademy.com/posts/football-and-Sustainability-how-is-the-worlds-favourite-sport-addressing-the-worlds-biggest-challenge.

Rafi, Talal. 2022. “Why Sustainability Is Crucial for Corporate Strategy - Climate Champions.” Climate Champions. June 16, 2022. https://climatechampions.unfccc.int/why-Sustainability-is-crucial-for-corporate-strategy/?gclid=CjwKCAjwvfmoBhAwEiwAG2tqzAMxdOaR5IhyMI_4a2Nw-J98YZb_eWDRPhOxbZp3X6b5RlxuIKrjihoCRF0QAvD_BwE.

Raisi, Omar Al. 2023. “Premier League Clubs Retail, Merchandise, Apparel & Product Licensing Revenue Data.” The Sports Journal, January. https://sportsjournal.io/premier-league-merchandise-revenue-data/.

Ransom, Danny. 2023. “SL Benfica: The Talent Factory.” International Soccer Science & Performance Federation. August 16, 2023. Accessed October 15, 2023. https://www.isspf.com/talent-identification-soccer-sl-benfica/.

Record. 2002. “Custo do novo estádio da Luz aumenta 12,6 por cento.” *Record*, January 8, 2002. Accessed November 14, 2023. https://www.record.pt/futebol/futebol-nacional/liga-betclic/benfica/detalhe/custo-do-novo-estadio-da-luz-aumenta-126-por-cento.

Ribeiro, Nuno. 2012. “Metodologia Facility Management Aplicada Ao Estádio Do Dragão.” *Instituto Politécnico Do Porto*. Instituto Politécnico do Porto. Accessed November 14, 2023. https://recipp.ipp.pt/bitstream/10400.22/3328/1/DM_NunoRibeiro_2012_MEC.pdf.

Roddel, Shannon. 2012. “Green Companies Earn More ‘green,’ New Study Shows.” Notre Dame News. March 26, 2012. Accessed November 1, 2023. https://news.nd.edu/news/more-than-tree-hugging-green-companies-earn-more-green-new-study-shows/.

Roseira Cayolla, Ricardo, Marco Escadas, Rui Biscaia, Timothy Kellison, Joana A. Quintela, and Teresa Santos. 2023. “Fans’ Perceptions of pro-Environmental Sustainability Initiatives in Sport and Triple Bottom Line Benefits.” *International Journal of Sports Marketing and Sponsorship* 24 (2): 395–421. https://doi.org/10.1108/ijsms-07-2022-0141.

Santos Dias, Sónia. 2023. “Delta é a marca para a qual a sustentabilidade mais contribui para o valor financeiro.” *Jornal De Negócios*, September 7, 2023. Accessed October 23, 2023. https://www.jornaldenegocios.pt/sustentabilidade/governacao/detalhe/delta-e-a-marca-para-a-qual-a-sustentabilidade-mais-contribui-para-o-valor-financeiro.

Segger, Marie-Claire Cordonier, and Ashfaq Khalfan. 2004. “Origins of the Sustainable Development Concept.” Oxford Academic. In *Sustainable Development Law: Principles, Practices, and Prospects*, Online, 15–24. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199276707.003.0002.

Sharma, Saaniya. 2023. “What Is the Carbon Footprint of Sport?” Carbon Literacy Project. February 2023. https://carbonliteracy.com/what-is-the-carbon-footprint-of-sport/.

Sheridan, Jim. 2023. “What Is the TMO at the Rugby World Cup 2023 and Is It the Same as VAR?” *The Sun*, October 19, 2023. Accessed October 4, 2023. https://www.thesun.co.uk/sport/5451921/tmo-six-nations-var/.

Simmonds, Daphne, and Anol Bhattacherjee, eds. 2012. *Environmental Sustainability in Organizations: The Information Technology Role*. Website. *AMCIS 2012 Proceedings*. 11th ed. Americas Conference on Information Systems. https://aisel.aisnet.org/cgi/viewcontent.cgi?article=1167&context=amcis2012.

Solberg, Lauren. 2022. “Why Sustainable Strategies Outperformed in 2021.” Morningstar, Inc. January 19, 2022. https://www.morningstar.com/sustainable-investing/why-sustainable-strategies-outperformed-2021

Sonae. 2023. “A nossa abordagem” Sonae. 2023. Accessed October 22, 2023. https://sustentabilidade.sonae.pt/pt-pt/abordagem/.

Sonae. 2023a. “O nosso compromisso - Sonae.” Sonae. 2023. Accessed October 22, 2023. https://sustentabilidade.sonae.pt/pt-pt/o-nosso-compromisso/.

Song, Lan, Xiaojiao Zhan, Huahan Zhang, Ming Xu, Jianguo Liu, and Chunmiao Zheng. 2022. “How Much Is Global Business Sectors Contributing to Sustainable Development Goals?” *Sustainable Horizons* 1 (January): 100012. https://doi.org/10.1016/j.horiz.2022.100012.

Southampton Football Club. 2021. “Saints Join UNFCCC’s Sports for Climate Action Initiative.” Southampton F.C. January 26, 2021. Accessed September 15, 2023. https://www.southamptonfc.com/en/news/article/saints-join-unfcccs-sports-for-climate-action-initiative.

Sport Lisboa e Benfica. 2018. “Fundação Benfica, Relatório e Contas.” 2018. SLB. Accessed September 10, 2023. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjo8qTtjqCBAxU8RKQEHQQ0CUgQFnoECA8QAQ&url=https%3A%2F%2Fmedia.slbenfica.pt%2F-%2Fmedia%2FBenficaDP%2FBusiness%2FFundacao%2Fdocs%2FFB_Relatorio_2018_assinado&usg=AOvVaw1j4InuOeSNMCL7TD_x1LNq&cshid=1694351695036870&opi=89978449.

Sport Lisboa e Benfica. 2023. “Apoie a Fundação Benfica Doando 0,5%, Sem Custos, Do Seu IRS!” SL Benfica. March 30, 2023. Accessed October 22, 2023. https://www.slbenfica.pt/pt-pt/agora/noticias/2023/03/30/clube-fundacao-benfica-irs-solidario-de-1-de-abril-a-30-de-junho-2023.

Sport Lisboa e Benfica. 2023a. “Relatório e Contas 2022/23.” *SL Benfica*. Sport Lisboa e Benfica - Futebol, SAD. Accessed October 17, 2023. https://www.slbenfica.pt/pt-pt/instituicao/sad/prestacao-de-contas/contas-anuais.

Sport Lisboa e Benfica. n.d. “Projeto ECO Benfica.” SL Benfica. Accessed November 4, 2023. https://www.slbenfica.pt/pt-pt/instituicao/eco-benfica/sobre.

Sport Lisboa e Benfica. n.d. “Casas, Filiais e Delegações do SL Benfica.” SL Benfica. 2023. Accessed November 8, 2023 https://www.slbenfica.pt/pt-pt/instituicao/casas-do-benfica.

Sport Lisboa e Benfica. n.d. “Estádio.” SL Benfica. 2023. Accessed November 20, 2023 https://www.slbenfica.pt/pt-pt/instituicao/instalacoes/estadio/caracteristicas-zonas.

Sport Lisboa e Benfica. n.d. “Benfica Escolas de Futebol.” SL Benfica. Accessed December 8, 2023 https://www.slbenfica.pt/pt-pt/modalidades/escolas-modalidades/escolas-futebol/contactos-e-inscricoes.

Sport Lisboa e Benfica. n.d. “Benfica Official Stores.” SL Benfica. Accessed December 4, 2023 https://www.slbenfica.pt/pt-pt/instituicao/instalacoes/benfica-official-stores.

Sport Lisboa e Benfica. n.d. “Palmarés.” SL Benfica. Accessed December 2, 2023 https://www.slbenfica.pt/pt-pt/instituicao/clube/palmares.

Sport Lisboa e Benfica. n.d. “Orçamento: Época Desportiva 2023-2024.” SL Benfica. Accessed December 8, 2023. https://www.slbenfica.pt/pt-pt/instituicao/clube/orcamento.

Sport Lisboa e Benfica. n.d. “ECO Benfica.” SL Benfica. Accessed December 8, 2023a. https://www.slbenfica.pt/pt-pt/instituicao/eco-benfica.

Sport Lisboa e Benfica. n.d. “Benfica Campus.” SL Benfica. Accessed November 13, 2023. https://www.slbenfica.pt/pt-pt/instituicao/instalacoes/benfica-campus.

Sprung, Shlomo. 2019. “Benfica’s Develop-And-Sell Strategy Has It Turning Record Profits While Succeeding On The Field.” *Forbes*, December 10, 2019. Accessed October 29, 2023. https://www.forbes.com/sites/shlomosprung/2019/12/10/benfica-turning-record-profits-develop-and-sell-strategy/?sh=7c33fd454846.

Stobierski, Tim. 2021. “15 Eye-Opening Corporate Social Responsibility Statistics.” Harvard Business School Online. June 15, 2021. https://online.hbs.edu/blog/post/corporate-social-responsibility-statistics.

Sroufe, Robert. 2018. *Integrated Management: How Sustainability Creates Value for Any Business*. Website. 1st ed. Bingley, West Yorkshire, United Kingdom of Great Britain and Northern Ireland: Emerald Publishing Limited. https://research.ebsco.com/linkprocessor/plink?id=e6c32902-f3b3-3ed9-82b9-c4a00796ebb8.

STX Group. 2023. “Why Should the Sports Industry Be More Sustainable?” STRIVE by STX. July 19, 2023. https://strive.stxgroup.com/latest-news/why-should-the-sports-industry-be-more-sustainable/.

Sweet, Julie. 2023. “United Nations Global Compact-Accenture CEO Study.” Accenture. 2023. https://www.accenture.com/content/dam/accenture/final/accenture-com/document/Accenture-CEO-Study-United-Nations-Global-Compact.pdf.

The Brand Hopper. 2023. “Marketing Strategies And Brand Campaigns Of Patagonia.” June 20, 2023. https://thebrandhopper.com/2023/06/20/marketing-strategies-and-brand-campaigns-of-patagonia/.

ThierryHenry14. 2018. “Big Data in Sports: How S.L. Benfica Is Using Machine Learning to Build a European Football Powerhouse - Technology and Operations Management.” https://d3.harvard.edu/platform-rctom/submission/big-data-in-sports-how-s-l-benfica-is-using-machine-learning-to-build-a-european-football-powerhouse/

Transfermarkt. n.d. “SL Benfica - Stadium - Estádio Da Luz.” Accessed November 15, 2023. https://www.transfermarkt.com/benfica-lissabon/stadion/verein/294.

Trendafilova, Sylvia, Brian McCullough, Michael Pfahl, Sheila N. Nguyen, Jonathan Casper, and Manuela Picariello. 2014. “Environmental Sustainability in Sport: Current State and Future Trends.” *Global Journal on Advances in Pure & Applied Sciences* 3 (March): 9–14. https://www.icsspe.org/system/files/Trendafilova%20et%20al.%20-

%20Environmental%20sustainability%20in%20sport%20Current%20state%20and%20future%20trends.pdf.

UEFA. 2022. "UEFA Joins United Nations '*Football for the Goals*' Initiative as Inaugural Member." *UEFA*, July 6, 2022. Accessed October 9, 2023. https://www.uefa.com/insideuefa/news/0277-158f0f1a3cd0-cf3459f23a0c-1000--uefa-joins-united-nations-football-for-the-goals-initiative/.

uHoo Business. 2023. "Why Do You Need To Obtain Green Building Certifications?" uHoo. March 24, 2023. Accessed October 29, 2023. https://getuhoo.com/blog/business/why-do-you-need-to-obtain-green-building-certifications/.

United Nations and UEFA. 2022. "United Nations Launches the *Football for the Goals* Initiative UEFA Joins as Inaugural Member." Press release. July 6, 2022. https://www.un.org/sustainabledevelopment/wpcontent/uploads/2022/07/UN_Press_Release_FFTG_ENG.pdf.

United Nations Climate Change. 2018. "*Sports for Climate Action* Framework." Press release. December 2018. https://unfccc.int/sites/default/files/resource/Sports_for_Climate_Action_Declaration_and_Framework_0.pdf.

United Nations Climate Change. 2018a. "*Sports for Climate Action* On The Race To Zero: Information Pack." Press release. December 2018. https://unfccc.int/sites/default/files/resource/S4CA_prospective%20signatory%20booklet.pdf.

United Nations Development Programme. 2023. “Background on the Goals : United Nations Development Programme.” UNDP. 2023. Accessed November 11, 2023. https://www.undp.org/sdg-accelerator/background-goals.

United Nations. n.d. “Sports for Climate Action.” United Nations Climate Change. https://unfccc.int/climate-action/sectoral-engagement/sports-for-climate-action.

United Nations. n.d. “Climate Change.” Accessed September 29, 2023. https://www.un.org/en/global-issues/climate-change.

United Nations. 2021. “Four Premier League Clubs Taking Climate Action.” *United Nations Climate Change*, February 26, 2021. Accessed October 1, 2023. https://unfccc.int/news/four-premier-league-clubs-taking-climate-action.

United Nations. 2023. “THE 17 GOALS : Sustainable Development.” UN. 2023. Accessed November 11, 2023. https://sdgs.un.org/goals.

United States Green Building Council. 2013. “LEED Facts.” USGBC. August 7, 2013. Accessed November 1, 2023. https://www.usgbc.org/articles/leed-facts.

United States Green Building Council. 2018. “Press: About LEED” USGBC. August 14, 2018. https://www.usgbc.org/press/about-leed.

United States Green Building Council. 2020. “Project 4A Building - Tech Hub SONAE.” USGBC. May 13, 2020. https://www.usgbc.org/projects/project-4a-building-tech-hub-sonae.

United States Green Building Council. 2022. “Synergies between LEED and SDGs.” USGBC. November 8, 2022. Accessed October 20, 2023. https://www.usgbc.org/resources/synergies-between-leed-and-sdgs.

United States Green Building Council. 2023. “LEED v5 Rating System - Building Operations + Maintenance: Existing Buildings Beta Version.” *USGBC*. United States Green Building Council. Accessed November 3, 2023. https://www.usgbc.org/sites/default/files/2023-09/LEED-v5-OM-Existing-Buildings-beta-version_1.pdf.

United States Green Building Council. 2023a. “LEED Certification for Existing Buildings and Spaces.” USGBC. 2023. Accessed October 4, 2023. https://www.usgbc.org/leed/rating-systems/existing-buildings.

United States Green Building Council. 2023b. “LEED Price Estimate.” USGBC. 2023. Accessed November 20, 2023. https://www.usgbc.org/tools/leed-certification/pricing-tool.

United States Green Building Council. 2023c. “LEED Rating System.” USGBC. 2023. Accessed October 11, 2023. https://www.usgbc.org/leed#:~:text=LEED%20(Leadership%20in%20Energy%20and,environmental%2C%20social%20and%20governance%20benefits.

United States Green Building Council. 2023d. “LEED v5 Is the Newest Version of LEED.” USGBC. September 2023. Accessed October 23, 2023. https://www.usgbc.org/leed/v5.

United States Green Building Council. 2023e. “USGBC’s Green Going Out Guide.” Google. October 20, 2023. Accessed November 9, 2023. https://www.google.com/maps/d/viewer?mid=1ouZh5fPkA0hGmRSljNnuGNn3wss&hl=en_US&ll=37.012936991344105%2C-87.07278102167905&z=4.

United States Green Building Council. 2023f. “LEED Project Profiles.” USGBC. November 2023. Accessed October 4, 2023. https://www.usgbc.org/projects?Country=%5B%22Portugal%22%5D&SearchResult=1&SearchResultsortOption=%22Featured+Projects%22.

United States Green Building Council. 2023g. “LEED Project Profiles.” USGBC. November 2023. Accessed October 4, 2023. https://www.usgbc.org/projects?Country=%5B%22United+Kingdom%22%2C%22Albania%22%2C%22Andorra%22%2C%22Armenia%22%2C%22Austria%22%2C%22Belarus%22%2C%22Belgium%22%2C%22Bulgaria%22%2C%22Croatia%22%2C%22Cyprus%22%2C%22Czech+Republic%22%2C%22Czechia%22%2C%22Denmark%22%2C%22Estonia%22%2C%22Finland%22%2C%22France%22%2C%22Georgia%22%2C%22Germany%22%2C%22Greece%22%2C%22Hungary%22%2C%22Iceland%22%2C%22Ireland%22%2C%22Italy%22%2C%22Latvia%22%2C%22Liechtenstein%22%2C%22Lithuania%22%2C%22Luxembourg%22%2C%22Malta%22%2C%22Monaco%22%2C%22Montenegro%22%2C%22Netherlands%22%2C%22Norway%22%2C%22Poland%22%2C%22Romania%22%2C%22Russia%22%2C%22Serbia%22%2C%22Slovakia%22%2C%22Slovenia%22%2C%22Spain%22%2C%22Sweden%22%2C%22Switzerland%22%2C%22Ukraine%22%5D&Search+Library=%22stadi%22&SearchResultsortOption=%22Featured+Projects%22.

United States Green Building Council. n.d. “Benefits of Green Building.” USGBC. Accessed October 28, 2023. https://www.usgbc.org/press/benefits-of-green-building.

Van Halm, Isabeau. 2022. “Weekly Data: The 2022 World Cup May Emit More than Any International Sporting Event in the Last 12 Years.” *Energy Monitor*, December 14, 2022. https://www.energymonitor.ai/carbon-markets/weekly-data-the-2022-world-cup-may-emit-more-than-any-international-sporting-event-in-the-last-12-years/?cf-view&cf-closed.

Vanderweil, Peter. 2008. “Greening Stadiums: Study of Environmentally Responsible Methods of Building and Retro-Fitting Stadiums.” MSc Dissertation, Massachusetts Institute of Technology. https://dspace.mit.edu/bitstream/handle/1721.1/58641/315847657-MIT.pdf?sequence=2

Varmus, Michal, Milan Kubina, Pavol Boško, and Martin Mičiak. 2022. “Application of the Perceived Popularity of Sports to Support the Sustainable Management of Sports Organizations.” *Sustainability* 14 (3): 1927. https://doi.org/10.3390/su14031927.

Vincent, Susie. 2022. “Zero Waste Sports Stadiums Are Already in Play.” TRUE. October 6, 2022. Accessed November 9, 2023. https://true.gbci.org/zero-waste-sports-stadiums-are-already-play.

Wade, George. 2023. “What Are Scope 1, 2 and 3 Carbon Emissions?” Zevero. January 4, 2023. Accessed September 17, 2023. https://www.zevero.earth/post/what-are-scope-1-2-and-3-emissions.

Water Lovers of Singapore. 2016. “Why Water Is More Important to Football than You Think.” Water Chatter. June 15, 2016. Accessed November 13, 2023. https://waterchatter.wordpress.com/2016/06/15/why-water-is-important-to-football/.

Weston, Barney. 2023. “World Cup Bid Process Makes a Mockery of Green Pledges – It’s Time for Reform.” *The Guardian*, November 1, 2023. Accessed November 11, 2023. https://www.theguardian.com/football/2023/nov/01/world-cup-bid-process-makes-a-mockery-of-green-pledges-its-time-for-reform.

Wimbledon. n.d. “The UN Sport for Climate Action Framework.” Accessed September 18, 2023. https://www.wimbledon.com/en_GB/about_wimbledon/2020-07-01_the_un_sport_for_climate_action_framework.html.

Wired. 2017. “The Unlikely Secret behind Benfica’s Fourth Consecutive Primeira Liga Title.” *Wired*, May 13, 2017. Accessed September 9, 2023. https://wired.co.uk/article/bc/microsoft-sl-benfica.

World Green Building Council. 2021. “Sustainable Building Certifications.” World GBC. October 6, 2021. Accessed October 11, 2023. https://worldgbc.org/sustainable-building-certifications/.

World Green Building Council. 2022. “How Sustainable Buildings Are #BuildingResilience and Driving the Sustainable Development Goals - World Green Building Council.” August 10, 2022. Accessed October 14, 2023. https://worldgbc.org/article/how-sustainable-buildings-

are-buildingresilience-and-driving-the-sustainable-development-goals/#:~:text=Buildings%20are%20responsible%20for%2038,in%20areas%20with%20air%20pollution.

Yale Sustainability. 2020. “Yale Experts Explain Green Building Certifications.” October 19, 2020. Accessed November 16, 2023. https://sustainability.yale.edu/explainers/yale-experts-explain-green-building-certifications#:~:text=%E2%80%9CA%20green%20building%20certification%20verifies,Centerbrook%20Architects%20in%20Centerbrook%2C%20Connecticut.

ZeroZero. 2020. “Luz com 80 mil lugares? Arquiteto do estádio avança com possibilidade de expansão.” *ZeroZero*, October 29, 2020. Accessed November 2, 2023. https://www.zerozero.pt/noticias/luz-com-80-mil-lugares-arquiteto-do-estadio-avanca-com-possibilidade-de-expansao/301890.

ZipDo. 2023. “Essential Sustainability In Sports Statistics in 2023.” *ZipDo*, September. https://zipdo.co/statistics/Sustainability-in-sports/.

APPENDIX

Appendix 1: United Nations Sustainable Development Goals

Goal	Description	Related Topics
	End poverty in all its forms everywhere	Poverty Eradication
	End hunger, achieve food security and improved nutrition and promote sustainable agriculture	Rural Development; Food Security and Nutrition and Sustainable Agriculture
	Ensure healthy lives and promote well-being for all at all ages	Health and population; Sustainable Transport; National Strategies and SDG integration
	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Education
	Achieve gender equality and empower all women and girls	Gender Equality and Women's Empowerment
	Ensure availability and sustainable management of water and sanitation for all	Water and Sanitation
	Ensure access to affordable, reliable, sustainable and modern energy for all	Energy
	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Green Economy; Sustainable Tourism; Employment, decent work for all and social protection
	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	Industry; Sustainable Transport
	Reduce inequality within and among countries	Africa

	Make cities and human settlements inclusive, safe, resilient and sustainable	Disaster Risk Reduction; Sustainable Transport; Sustainable Cities and Human Settlements; National Strategies and SDG integration
	Ensure sustainable consumption and production patterns	Chemicals and Waste; Sustainable Consumption and Production; Sustainable Tourism
	Take urgent action to combat climate change and its impacts	Atmosphere; Climate Actions and Synergies; Small Island Development States; National Strategies and SDG integration
	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	Oceans and Seas; Small Island Development States; Sustainable Tourism
	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	Biodiversity and Ecosystems; Forests; Mountains; National Strategies and SDG integration; Desertification, Land Degradation and Drought
	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	Information for integrated Decision-Making and Participation; Institutional Frameworks and international cooperation for Sustainable Development; Violence Against Children; National Strategies and SDG integration
	Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development	Capacity Development; Finance; Financial Inclusion; Multi-stakeholder Partnerships; Science; Technology; Trade; National Strategies and SDG integration

Source: (United Nations 2023)

Appendix 2: LEED Criteria Table

Title	Type	Objective	Points
Assessment for Climate Resilience	Prerequisite	Ensure long-term safety and sustainability through a comprehensive assessment of the natural hazards that might affect the project's site in the present or future	-
Social Impact Assessment	Prerequisite	Prioritize community well-being, inclusivity, and diversity, and promote social equity using an analysis driven by a social impact checklist	-
Operational Carbon Projection	Prerequisite	Provide a baseline projection of operational carbon emissions from energy use and increase carbon literacy at the project level	-
Operational Planning and Response for Climate Resilience	Credit	Install an Emergency Response Plan that addresses the most impactful hazards identified in Prerequisite: Assessment for Climate Resilience, thus, aiming to ensure safety and maintain critical operations during and after emergencies	1
Equity within Operations and Maintenance Staff	Credit	Promote social equity by addressing needs and disparities among operations and maintenance workers. This is done by supporting skill development, personal well-being, and encouraging corporate social responsibility among involved firms.	1
Location and Transportation (LT)			
Sustainable Transportation Policy	LT Prerequisite	Outline a policy that promotes transportation options that support human-centred mobility and reduce negative effects of single-occupant vehicles on GHG emissions, public health and safety, traffic congestion, and land development	-

Sustainable Transportation Performance	LT Credit	Measure the performance of sustainable transportation in the project regarding the objectives of the LT Prerequisite: Sustainable Transportation Policy	1-14
Sustainable Sites (SS)			
Site Management Policy	SS Prerequisite	Simultaneously provide a clean, well-maintained, and safe building exterior and support high-performance building operations and integration into the surrounding landscape by preserving ecological integrity and encourage environmentally sensitive site management practices	-
Rainwater Management	SS Credit	Reduce runoff volume and improve water quality by replicating the site's natural hydrology and balance	1-2
Heat Island Effect	SS Credit	Reduce heat islands and counteract the intensifying heat caused by climate change to minimise effects on microclimates and human and wildlife habitats	1
Light Pollution Reduction	SS Credit	Increase night sky access, improve nighttime visibility, and reduce consequences of development for wildlife and people	1
Water Efficiency (WE)			
Water Management Policy	WE Prerequisite	Establish a policy that conserves low-cost potable water resources and promotes effective water management while supporting high-performance building operations	-
Water Metering	WE Prerequisite	Track water consumption to conserve low-cost potable water resources, support water management, and identify opportunities for additional water savings	-
Water Performance	WE Credit	Support water management, reduce potable water consumption, and preserve no and low-cost potable water resources	1-15

Energy and Atmosphere (EA)			
Energy and Carbon Policy Management	EA Prerequisite	Promote continuity of information to ensure that energy-efficient operating strategies are maintained and provide a foundation for green jobs training and system analysis	-
Refrigerant Policy and Maintenance Practices	EA Prerequisite	Reduce the emissions of refrigerants from existing equipments due to the very high global warming potential of older refrigerants and possible ozone depleting potential	-
Minimum Energy Performance	EA Prerequisite	Establish a minimum level of operating energy performance to promote resilience and reduce the environmental and economic harms associated with excessive energy use that disproportionately impact frontline communities	-
Decarbonisation and Efficiency Plans	EA Credit	Support long-term planning for deep reductions in greenhouse gas emissions from building energy and refrigerants through 2050	1-5
GHG Emissions Reduction	EA Credit	Reduce environmental and economic harm associated with greenhouse gas emissions from building energy use that disproportionately impacts frontline communities	1-12
Refrigerant Impact Reduction	EA Credit	Encourage reduce leakage of older refrigerants with high global warming potential (GWP) and ozone depleting potential, and encourage the installation of equipment using refrigerants with low GWP, particularly next-gen refrigerants with very low GWP	1-2
Grid Harmonisation	EA Credit	Reduce the stress on the grid from peak loads, reduce greenhouse gas emissions, increase grid reliability, and	1-2

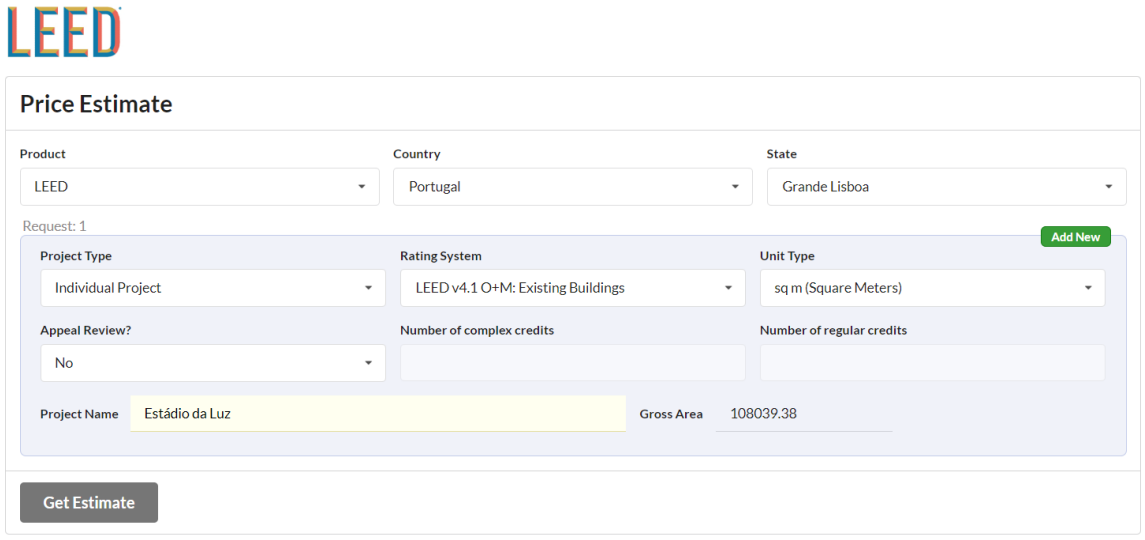
		make energy generation and distribution systems more affordable and efficient	
Energy Performance and Commissioning	EA Credit	Achieve higher levels of operating energy performance, and to support highly cost-effective improvements in building operations that lower energy waste and cost, reduce greenhouse gas emissions, and improve indoor environmental quality	1-14
Materials and Resources (MR)			
Materials Management Policy	MR Prerequisite	Conserve natural resources, promote a circular economy, and encourage responsible materials stewardship through reduction, reuse, and recycling. Reduce the disproportionate burden on underserved communities located near landfills and incinerators that is generated by building occupants' waste	-
Waste Performance	MR Credit	Prevent waste and reduce the amount of materials from building operations and maintenance that is disposed of in landfills or incinerators	1-7
Embodied Carbon of Interior Materials during Renovations	MR Credit	Cycle hard-to-recover and high-embodied carbon products during remodelling and renovation. Foster closed-loop product take-back and manufacturing products	1-2
Indoor Environmental Quality (EQ)			
Occupant Needs Assessment	EQ Prerequisite	Promote a better understanding of who is in the building on a regular basis, if there is a current population-specific or regionally specific health hazard, or evidence that there will be a future health hazard. Define occupant needs related to the indoor environment, and ensure and sustain access to indoor health-promoting features	-

Green Cleaning Policy	EQ Prerequisite	Foster a healthy building interior and site, and reduce the potential negative impact of cleaning, disinfecting and maintenance products and processes on the cleaning personnel, building occupants, and the environment	-
Verification of Ventilation and Filtration	EQ Prerequisite	Understand the amount of outdoor air being delivered by the ventilation systems, exhaust, and filtration and compare to ventilation standards for indoor air quality	-
Environmental Tobacco Smoke	EQ Prerequisite	Prevent or minimise exposure of building occupants, indoor surfaces, and ventilation air distribution systems to environmental tobacco smoke	-
Indoor Air Quality Performance	EQ Credit	Support indoor air quality awareness and identify opportunities for additional air quality improvements or energy savings. Promote occupants' comfort, well-being, and productivity by achieving acceptable indoor air quality	1-13
Occupant Satisfaction Survey	EQ Credit	Assess how well the building is performing for the occupants, particularly in regards with comfort	1-5
Green Cleaning	EQ Credit	Foster a healthy building interior and site, and reduce the potential negative impact of cleaning, disinfecting and maintenance products and processes on the cleaning personnel, building occupants, and the environment	1-2
Integrated Pest Management	EQ Credit	Minimise pest problems and exposure to pesticides	1
Project Priorities and Innovation (IN)			
Project Priorities	IN Credit	Promote achievement of credits that address geographically sensitive or adaptation-specific environmental, social equity, and public health	1-9

		priorities. Encourage projects to think creatively to test and accelerate new sustainable building practices and strategies	
LEED Accredited Professional	IN Credit	Encourage the team integration required by a LEED project and to streamline the application and certification process	1
Total Points Available			**110**

Source: (United States Green Building Council 2023)

Appendix 3: LEED Price Estimate Tool and Inputs Used



Source: (United States Green Building Council 2023b)

Appendix 4: Estimated Cost of LEED Certification

LEED

Price Estimate

Estimate On: 26 Nov 2023, 00:02:38 am

Product	LEED
State	Grande Lisboa
Country	Portugal
Currency	EUR - Euro

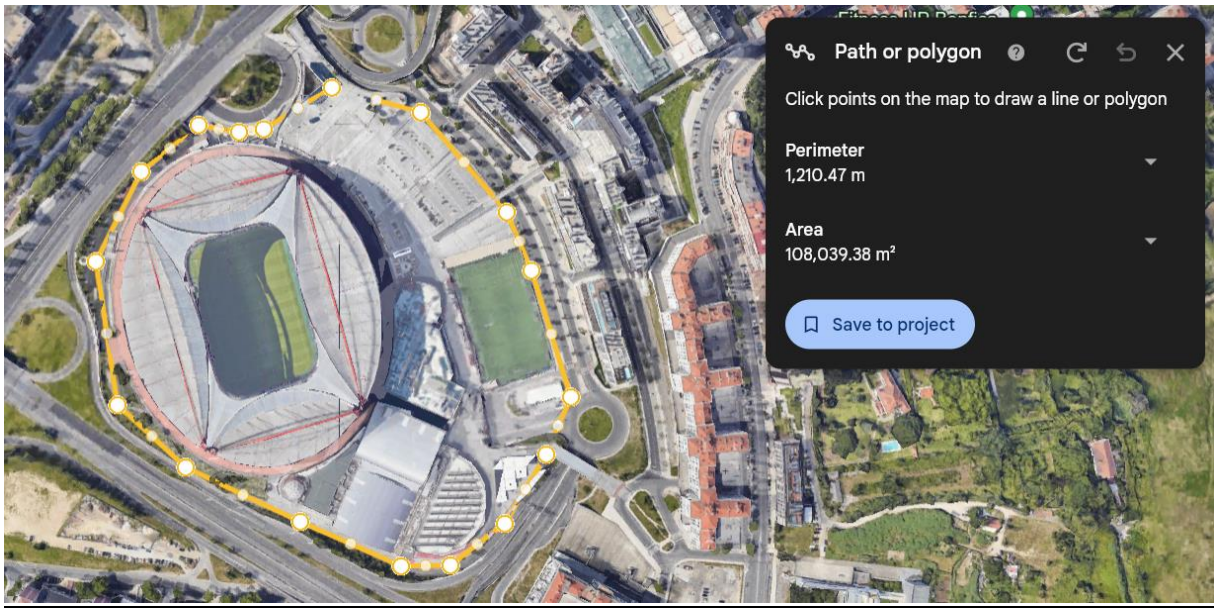
Project Type: Individual Project **Rating System:** LEED v4.1 O+M: Existing Buildings Request: 1

Item	Timeline			
	Precert + Standard		Standard	
	Member*	Non Member	Member*	Non Member
Registration	€ 1,188.00	€ 1,496.00	€ 1,188.00	€ 1,496.00
Precertification Preliminary Review	€ 3,960.00	€ 4,928.00	--	--
Estádio da Luz - 108,039.380 sq m				
|--- Standard Preliminary Review	€ 14,784.00	€ 17,740.80	€ 14,784.00	€ 17,740.80
Total	**€ 19,932.00**	**€ 24,164.80**	**€ 15,972.00**	**€ 19,236.80**

*USGBC Silver level and higher. For additional information on USGBC membership please visit www.usgbc.org.

Source: (United States Green Building Council 2023b)

Appendix 5: Estimated Project Area for LEED Certification



Source: Google Earth

Appendix 6: Initial Data used in LEED Project Valuation

Initial Data	
Discount rate	5.75%
Tax rate	22.5%
LEED Fees	
Registration [€]	1,496
Precertification [€]	4,928
Std Prelim Review [€]	17,740.80
LEED Benefits	
Energy Consumption Reduction	25%
Water Consumption Reduction	11%
Operational Costs Reduction (1st year)	10%
Operational Costs Reduction (5-year avg)	16.9%
Operational Costs Reduction (Overall after 1st year)	19%
Maintenance Costs Reduction	20%
Stadium	
Avg Energy Consumption p/ Seat [kWh]	161.03
Stadium Capacity	64,642
Annual Energy Consumption[kWh]	10,409,301
Avg Energy Price [€/kWh]	0.14
Energy Consumption Reduction [kWh]	2,602,325.32
Annual Energy Savings [€]	364,325.54
Annual Water Consumption [m3]	90,000
Water Price [€/m3]	1.43
Water Consumption Reduction [m3]	9,900
Annual Water Savings [€]	14,173.83
Annual Operational Costs [€]	23,338,000
Annual Maintenance Costs [€]	8,779,000
LEED Cost	
Avg Premium Over Construction Cost	4%
Stadium Construction Cost [€]	134,000,000
Cost of Retrofitment to LEED	5,360,000

Source: Own Elaboration

Appendix 7: Calculations for Estimate of NPV for First Scenario

LEED Valuation - Scenario 1						
Year	**0**	**1**	**2**	**3**	**4**	**5**
Maintenance Savings	0	1,755,800	1,755,800	1,755,800	1,755,800	1,755,800
Energy Savings	0	364,325.54	364,325.54	364,325.54	364,325.54	364,325.54
Water Savings	0	14,173.83	14,173.83	14,173.83	14,173.83	14,173.83
Pre Tax Savings	0	2,134,299.37	2,134,299.37	2,134,299.37	2,134,299.37	2,134,299.37
Taxes	0	480,217.36	480,217.36	480,217.36	480,217.36	480,217.36
After Tax Savings	0	1,654,082.01	1,654,082.01	1,654,082.01	1,654,082.01	1,654,082.01
Operational CF	**0**	**1,654,082.01**	**1,654,082.01**	**1,654,082.01**	**1,654,082.01**	**1,654,082.01**
CAPEX	-5,360,000	0	0	0	0	0
LEED Fees	-24,164.80	0	0	0	0	0
Investment CF	**-5,384,164.80**	**0**	**0**	**0**	**0**	**0**
Free Cash Flow	-5,384,164.80	1,654,082.01	1,654,082.01	1,654,082.01	1,654,082.01	1,654,082.01
Discounted Cash Flow	-5,384,164.80	1,564,143.75	1,479,095.74	1,398,672.10	1,322,621.37	1,250,705.79
Cumulative Cash Flow	-5,384,164.80	-3,820,021.05	-2,340,925.31	-942,253.21	380,368.16	1,631,073.95
NPV	**1,631,073.95**					

Source: Own Elaboration

Appendix 8: Calculations for Estimate of NPV for Second Scenario

LEED Valuation - Scenario 2						
Year	**0**	**1**	**2**	**3**	**4**	**5**
Maintenance Savings	0	1,755,800	1,755,800	1,755,800	1,755,800	1,755,800
Operational Savings	0	2,333,800	4,346,703	4,346,703	4,346,703	4,346,703
Pre Tax Savings	0	4,089,600	6,102,502.50	6,102,502.50	6,102,502.50	6,102,502.50
Taxes	0	920,160	1,373,063.06	1,373,063.06	1,373,063.06	1,373,063.06
After Tax Savings	0	3,169,440	4,729,439.44	4,729,439.44	4,729,439.44	4,729,439.44
Operational CF	**0**	**3,169,440**	**4,729,439.44**	**4,729,439.44**	**4,729,439.44**	**4,729,439.44**
CAPEX	-5,360,000	0	0	0	0	0
LEED Fees	-24,164.80	0	0	0	0	0
Investment CF	**-5,384,164.80**	**0**	**0**	**0**	**0**	**0**
Free Cash Flow	-5,384,164.80	3,169,440.00	4,729,439.44	4,729,439.44	4,729,439.44	4,729,439.44
Discounted Cash Flow	-5,384,164.80	2,997,106.38	4,229,109.37	3,999,157.79	3,781,709.50	3,576,084.63
Cumulative Cash Flow	-5,384,164.80	-2,387,058.42	1,842,050.95	5,841,208.74	9,622,918.24	13,199,002.87
NPV	**13,199,002.87**					

Source: Own Elaboration