

Contemporary Themes in the Hotel and Hospitality Sector (BMIH6001)

Student name: Ana Pescleveï

Student number: 2208738

Lecturer name: ERNEST WAVEI

I confirm that I have not used any AI tools in the research and creation of this assignment. I confirm that I have not presented any AI generated materials as my own work. I confirm I have copies of my drafts, notes, and other resources I used, which I may be asked to provide in evidence.

SUSTAINABILITY AND NET-ZERO IN THE HOTEL INDUSTRY

Abstract

The purpose of this study is to investigate energy efficiency initiatives in hotel operations alongside their effect on reaching net-zero emissions globally within the hospitality industry. The research used a PEST analysis framework to evaluate factors that influence sustainability strategies in hotels, in terms of political, economic, social, and technological factors. A pragmatic research philosophy is used with the data being collected secondarily from academic journals, industry reports and sustainability disclosures of major hotel chains, Marriott and Hilton.

Government policies together with the international agreements are shown to be key drivers of regulatory compliance, which is reinforced by economic analyses showing substantial, long-term cost savings from compliance despite high initial investments. The success story of Hilton's Light Stay system has been saved over \$1 billion in utility savings. Increasing consumer demand for green accommodations is specified by social factors, with the 83% of travellers factoring sustainability into their consideration. The technological innovations that underscore efficiency gains include smart building management systems in addition with the renewable energy integration.

The study highlights a variety of challenges such as high capital costs, operational disruption while retrofitting and differences between large chains and smaller properties. The paper concludes by finding that widespread deployment of energy efficient practices in the hospitality industry will require a comprehensive approach that integrates technological innovation, guest engagement, policy support and economic incentives.

TABLE OF CONTENTS

Introduction

Literature Review

Methodology

Theme Impact Analysis (PEST Analysis)

Conclusion

Recommendations

References

Introduction

As global climate challenges intensify, environmental regulations become stricter and eco-conscious guests grow, sustainability and net-zero emissions have become just as important for

the international hotel and hospitality industry. The sector is traditionally resource intensive, but it is embracing green innovations such as energy-efficient designs, renewable energy uptake and smart water management. They are setting a trend and Marriott and Hilton are setting the benchmarks. In 2022, Marriott reduced its carbon emissions per square metre by 24.6%, saved 45,000 MWh of energy together with installed more than 5,500 electric vehicle chargers. By 2030, Hilton has pledged to cut emissions intensity by up to 75%. Light Stay is the proprietary ESG tracking tool that has already reduced emissions by 44% alongside helped to produce more than \$1 billion in utility savings. Such efforts are part of a broader industry trend toward making sustainability integral to the operations of the company combining with environmental responsibility with excellent service standards and financial performance.

As climate concerns mount and 2030 SDGs become important, the hospitality industry has a quick pace forward towards sustainability. Eco-consciousness is rising, and regulations are tightening, and both no longer afford us time to delay. Energy efficiency in hotel operations is examined in this study with its effect on the sector is analysed using the PEST analysis framework.

Literature Review

Singh *et al.*, (2024) discussed that the hospitality sector plays a key role in global energy consumption, owing to its continued operations together with the requirement to deliver comfort for the guests. Hotel operations which have been identified as a critical area of concern requiring energy efficiency that have been aimed for decreasing the impacts on the environmental impact without compromising service quality. This literature review reports on the current strategies, technologies, and practice of the hotel industry in enhancing energy efficiency, as based on the findings from recent studies in addition with the industry reports. Rise of Sustainability alongside the Net Zero strategies defining operational excellence of the hotel industry aligning with environmental responsibility.

According to Ford and Sturman (2019), hospitality managers will need to embed sustainable practices with their core operations for meeting the growing expectations of the guests. According to Batbayar and Das (2019), the world is moving toward eco-conscious tourism and energy efficiency alongside waste reduction are some of the trends. According to Costa and Costa (2022), sustainable enhancement has a positive effect on competitiveness with the hotels implementing green technologies which helps in fulfilling the needs the regulatory together who the market needs. Prideaux *et al.*, (2007) meanwhile delve into the manner in which crises can be a catalyst for innovation in sustainable practices in the unpredictable environments. Net zero will not just do the Environment, it is a strategic imperative for the long-term success in global hospitality sector.

The operations of hotels are energy intensive with heating, ventilation, and air conditioning (HVAC) systems, lighting and hot water playing a major contribution in total energy consumption. As Menagai (2025) states, luxury hotels boast higher energy usage in comparison against mid-range and budget facilities because of these extensive facilities and services. For the successful implementation of energy-saving measures, it is important for having knowledge about these consumption patterns.

With the advancing technology, smart energy management systems are an enabler in hotels. Real time energy usage can be monitored and controlled with automated systems providing energy consumption optimisation depending on occupancy and usage patterns. Abid and Benadom, (2021) indicates that intelligent building control systems have had promise in balancing thermal comfort and energy efficiency. They use artificial intelligence to forecast and adjust energy usage with meaningful results.

A strategic approach of net zero emissions is in incorporating with renewable energy sources. Solar panels, wind turbines and geothermal systems are increasingly popular in hotels who want for running their operations without paying much. As an example, The Torridon in the Scotland have been utilising with the biomass energy which will help them in achieving the net zero emissions (The hotel journal, 2024).

MacAskill *et al.*, (2023) also believes that guest behaviour has significant impact on a hotel's energy consumption. By engaging guests in these sustainability efforts like the reuse of towels, adjusting with the room temperature with energy use can be meaningfully reduced. Educating guests and giving incentives has proven for increasing participation in energy-saving programmes.

To promote energy efficiency, governments and also industry bodies have devised policies combining with the certification programmes for hotels. Velora's *et al.*, (2025) states that certifications such as LEED, Green Key following with the Earth Check offer hotels structure for evaluating together with strengthening their sustainable practice. The number of hotels that earned such certifications increased in 2023, a sign that energy efficiency is in more companies' minds.

Energy efficient technologies and practices can be a great cost saver for hotels if invested in. Hilton (2024) reports more than \$1 billion in utility cost savings since launching its Light Stay system which monitors together with it manages energy consumption through its properties. These savings help generate a higher revenue alongside efficiently boost the hotel's green reputation among those sensitive to environment.

While there are benefits, as per Singh *et al.*, (2024), the widespread adoption of the practices that are energy-efficient in the hotel industry faces with several challenges. They face with the

high initial investment costs, lack of awareness about the possibility of financing and lack of access to them. Retrofitting existing buildings with energy-efficient technologies can be very disruptive and complicated in operations. These challenges need to be addressed by the collaboration between stakeholders such as government incentives in addition with the industry partnerships. Improving the energy efficiency of hotel operations is a complex challenge requiring technological innovation, engaging guests, support from policy following with a business case.

Methodology

The research approach taken in this study is a pragmatic philosophy which is a combination of objective in addition with the contextual points of view in the search for practical applications of sustainability in the hotel industry (Gillespie *et al.*, 2024). The approach is deductive, basing established theories of sustainability following with the energy efficiency on the industry data (Fife and Gossner, 2024). The descriptive research design was used for the systematic study of existing practices together with their outcome (Kumar and Praveenkumar, 2025). The study is based on secondary data collection from the academic journals, industry reports following with the sustainability disclosures by major hotel chains such as the Marriott, Hilton etc. and other credible sources like SAGE, IGI Global, ScienceDirect, MDPI, etc (Mazhar *et al.*, 2021). The study employs a PEST framework (Political, Economic, Social and Technological) analysis with which external factors affect energy efficiency strategies (Ho, 2014). Thematic analysis of sustainability reports is then employed for conducting the supplementary analysis which helps to identify patterns, strengths together with the gaps on current practices. This methodology approach provides a balanced approach of how energy efficiency initiatives are shaped, executed and appraised in the hotel together with the hospitality domain.

Theme Impact Analysis (PEST Analysis)

Political Factors

Sustainability agendas in hospitality are hugely influenced by government policies and international agreements. Mandatory reporting standards, climate change legislation following with especially carbon pricing mechanisms force more and more hotels to take greener measures. Hotel chains will have in integration of the charges for not complying with the European Union's Green Deal or Global carbon border adjustment mechanisms for carbon footprint in addition with it will be forced for the reduction of their carbon footprint as they will have to run their projects in the European markets (European Commission, 2023). Programmes such as the Energy Savings Opportunity Scheme (ESOS) together with the Streamlined Energy and Carbon Reporting (SECR) are mandatory in many UK companies.

Furthermore, programmes like LEED, Green Key in addition with the EarthCheck, sometimes with the backing of government bodies and tourism marketing boards, force hotels for satisfying the regulations set for the environment (Velaoras *et al.*, 2025). Whatley Manor Hotel & Spa in Malmesbury have the Michelin Green Star which aligns with the sustainability commitment of UK (The hotel journal, 2024).

Economic Factors

Economic implications of the hospitality sector energy efficiency and net zero schemes are considered as the substantial. The initial capital investment for technologies like solar panels, smart HVAC systems and LED lighting is often significant, but long-run operational savings usually more than the expenditures (Vijayan *et al.*, 2023). For example, Hilton's Lightstay system which has contributed more than \$1 billion in utility cost savings, demonstrates the economic value of monitoring along with the controlling energy consumption (Hilton, 2024). The Green House Hotel in Bournemouth has the 100 changes in their sustainable operational operations for sustainability without the reduction of the luxury (The hotel journal, 2024).

Figure 2: Solar panel lighting

(Source: Vijayan *et al.*, 2023)

Revenue growth is due to consumer demand for eco-friendly hotels as guests are more inclined for favouring the sustainable options. Booking.com's (2024) survey found that 83% global travellers consider sustainability important when choosing where to stay. The pressure of this market encourages hotels for following with the green practices to remain competitive.

However, UK inflation, supply chain disruptions and the hangover of the Covid pandemic has have decreased the available capital (Aigbedo, 2021). Financing to upgrade for sustainability is especially difficult for smaller as well as the independent hotels. Furthermore, varying energy prices could encourage following with the synchronise energy efficiency investments while influencing the timeline on return on investments.

Social Factors

The success of sustainability efforts in hotels is critically influenced by societal attitudes and guest behaviour. The environmental awareness of consumers is increasing following with the people are looking for accommodations that show responsibility in the decrease of carbon emissions and waste. MacAskill *et al.*, (2023) found that programmes aimed at guests for reusing the towels alongside decrease energy consumption when staying in hotels effectively reduced the energy use.

Another social aspect dealing with sustainability is employee engagement. Implementing combined with the maintenance of the energy-saving measures effectively can be supported by

information from staff trained in green practices (Chen and Chen, 2021). In addition, hotels are beginning to see sustainability as an added reputational value to the organisation, leading to employee morale and recruitment of talent with corporate social responsibility being a priority. The sustainable culture among the staffs together with the guests is developed by The Scarlet Hotel in Cornwall (The hotel journal, 2024).

Technological Factors

The advancements in sustainability in the hotel industry are all brought through the technological innovation. Building management systems (BMS) that make the utilisation of sensors together with the AI for optimising the energy utilisation have shown large efficiency gains (Bajwa *et al.*, 2024). According to Abid and Benhaddou (2021), intelligent control systems enable dynamic adjustment of HVAC, lighting and other utilities based on occupancy and weather patterns, reducing waste, while maintaining comfort.

Renewable energy technologies like solar photovoltaic (PV) panels, geothermal heating and cooling following with the wind turbines are becoming integrated into hotel infrastructure. The feasibility of renewables is also augmented by battery storage in addition with the grid integration. Like Premier Inn have utilised thermostats with the occupancy sensors that helps in reduction of the consumption of energy.

Innovations such as blockchain solutions for tracking energy, Internet of Things (or IoT) devices for real-time monitoring following with the digital twins allow for simulation of energy scenarios, among other things which provide new tools for optimising sustainability strategies (Borowski, 2021). However, excessive cost of technology deployment, necessity of specific technical expertise and security of data are adoption barriers.

Figure 3: Digitalisation in energy supply

(Source: Borowski, 2021)

Industry Responses: Strengths and Limitations

These external pressures have been resulted in many hotel chains responding proactively. The leadership shown by Marriott in reducing their own direct emissions by 24.6% since 2016 together with the installing 5,500 EV chargers worldwide clearly shows leadership in both elimination of direct carbon output and promotion of sustainable transportation (Greenlodgingnews, 2024). Hilton's Light Stay platform is one such, in the way they are turning sustainability goals into actual, measured financial in addition with the environmental outcomes.

A heterogeneous industry, with the smaller properties not having the resources in terms of technology or certifications. However, retrofitting older buildings is costly together with the

operationally disruptive (Iwuanyanwu *et al.*, 2024) limiting the pace of progress. In UK various hotels now provide with the EV charging stations together with the systems for water-saving.

Conclusion

The transition of energy efficiency and net-zero emissions in the hospitality industry represents an environmental imperative combined with a strategically sound opportunity from a business perspective. Using PEST analysis, this study shows that effective sustainability initiatives need for matching together political support, economic viability, social acceptance, and technological innovation. Although hotels such as Marriott in addition with the Hilton illustrate the benefits that can be realised by implementing these things systematically with the actual transformation across the industry requires addressing the financial barriers, regulatory standardisation and technological accessibility required for facilitating the widespread implementation. The future of the sector's competitiveness increasingly rests on striking a balance between operational excellences following with the environmental responsibility.

Recommendations

1. Industry-Wide Financing

The hospitality sector must devise collaborative financing solutions to solve capital investment barriers, especially among the small together with the independent hotels. Financial institutions should work with industry associations to establish green financing programmes, under favourable terms where they support commercial finance for energy efficiency upgrades. Renewable energy technologies in addition with the smart building systems, should be encouraged for being widely deployed through standardising government incentives and tax credits across regions (Cooper and Hall, 2022).

2. Sustainability Reporting

It is important for hotels in adopting the uniform sustainability reporting standards so that meaningful comparison or benchmarking of sustainability successes within hotels and across the industry can be facilitated. A digital platform should be built and be situated atop existing frameworks such as LEED together with the Green Key, enabling real-time tracking of energy consumption, carbon emissions as well as the cost savings (Velaoras *et al.*, 2025). Standardisation of this data would enable similar verticals for sharing knowledge and benefit from faster adoption of best practices across various property types and geographical locations.

3. Guest Engagement

They need to provide extensive guest education programmes that educate their guests on the important topic of sustainability and how that feeds into their experience with their specific hotel, but not at the expense of the quality of the service until it becomes second nature to them. Gamification elements are put in place for encouraging the energy-saving behaviour, real-time

feedback on environmental impact is provided following with the incentives are provided for sustainable choice (MacAskill *et al.*, 2023). Consistent implementation of this rule, however, requires that the staff training programmes highlight the dual benefits that environmental responsibility brings and added guest satisfaction.

4. Technology Integration

Smart building management systems and renewable energy solutions should be deployed in partnership between hotel operators, technology providers in combination with the energy companies in the industry to begin with. Finally, projects aimed at developing the most cost-effective retrofitting solutions for older buildings and introducing novel modular sustainability technologies, to be scaled for suiting with the different hotel size, should be encouraged by collaborative research initiatives (Singh *et al.*, 2024). Furthermore, such agreements on data sharing between hotel chains with similar technology would improve system optimisation and minimise implementation cost by sharing potential learning experiences.

References

- Aigbedo, H., 2021. Impact of COVID-19 on the hospitality industry: A supply chain resilience perspective. *International Journal of Hospitality Management*, 98, p.103012. DOI: <https://doi.org/10.1016/j.ijhm.2021.103012>
- Bajwa, A., Jahan, F. and Ahmed, I., 2024. A Systematic Literature Review On AI-Enabled Smart Building Management Systems For Energy Efficiency And Sustainability. *Noor alam and Ahmed, Ishtiaque, A SYSTEMATIC LITERATURE REVIEW ON AI-ENABLED SMART BUILDING MANAGEMENT SYSTEMS FOR ENERGY EFFICIENCY AND SUSTAINABILITY* (December 15, 2024). DOI: <https://doi.org/10.63125/4sjfn272>
- Batabyal, D. and Das, D.K. eds., 2019. *Global Trends, Practices, and Challenges in Contemporary Tourism and Hospitality Management*. IGI Global.
- Booking.com, 2024. *Latest Booking.com sustainable travel data reveals ongoing challenges for consumers & highlights a heightened opportunity for cross-industry collaboration*. Available at: <https://news.booking.com/latest-bookingcom-sustainable-travel-data-reveals-ongoing-challenges-for-consumers--highlights-a-heightened-opportunity-for-cross-industry-collaboration/> [Accessed on: 22-05-2025]
- Borowski, P.F., 2021. Digitization, digital twins, blockchain, and industry 4.0 as elements of management process in enterprises in the energy sector. *Energies*, 14(7), p.1885. DOI: <https://doi.org/10.3390/en14071885>

- Chen, C.H.V. and Chen, Y.C., 2021. Assessment of enhancing employee engagement in energy-saving behavior at workplace: an empirical study. *Sustainability*, 13(5), p.2457. DOI: <https://doi.org/10.3390/su13052457>
- Cooper, C. and Hall, C.M., 2022. *Contemporary tourism: An international approach*. http://www.goodfellowpublishers.com/free_files/Preface,%20contents%20and%20copyright-49fb75618a791b44632d1b317a8d7aa8.pdf
- Costa, V. and Costa, C. eds., 2022. *Sustainability and Competitiveness in the Hospitality Industry*. IGI Global.
- Fife, S.T. and Gossner, J.D., 2024. Deductive qualitative analysis: Evaluating, expanding, and refining theory. *International Journal of Qualitative Methods*, 23, p.16094069241244856. DOI: 10.1177/16094069241244856
- Ford, R.C. and Sturman, M.C., 2019. *Managing hospitality organizations: Achieving excellence in the guest experience*. SAGE Publications.
- Gillespie, A., Glăveanu, V. and de Saint Laurent, C., 2024. Pragmatism and methodology: Doing research that matters with mixed methods. *Cambridge University Press*. https://eprints.lse.ac.uk/121579/1/Gillespie_pragmatism_and_methodology_published.pdf
- Greenlodgingnews, 2024. *Some Highlights from Marriott International's 2023 Serve 360 Report*. Available at: <https://www.greenlodgingnews.com/some-highlights-from-marriotts-2023-serve-360-report/> [Accessed on: 22-05-2025]
- Hilton, 2024. *Hilton Worldwide, Inc. - Climate Change 2022*. Available at: https://esg.hilton.com/wp-content/uploads/sites/4/2023/05/CDP-Climate-2022_Hilton-Worldwide.pdf [Accessed on: 22-05-2025]
- Ho, J.K.K., 2014. Formulation of a systemic PEST analysis for strategic analysis. *European academic research*, 2(5), pp.6478-6492. https://www.academia.edu/download/38097664/ear_formulation_systemic_pest_analysis.pdf
- Iwuanyanwu, O., Gil-Ozoudeh, I., Okwandu, A.C. and Ike, C.S., 2024. Retrofitting existing buildings for sustainability: Challenges and innovations. *Engineering Science & Technology Journal*, 5, pp.2616-31. DOI: 10.51594/estj. v5i8.1515
- Kumar, A. and Praveenakumar, S.G., 2025. *Research methodology*. Authors Click Publishing.
- MacAskill, S., Becken, S. and Coghlan, A., 2023. Engaging hotel guests to reduce energy and water consumption: A quantitative review of guest impact on resource use in tourist accommodation. *Cleaner and Responsible Consumption*, 11, p.100156. DOI: <https://doi.org/10.1016/j.clrc.2023.100156>

Mazhar, S.A., Anjum, R., Anwar, A.I. and Khan, A.A., 2021. Methods of data collection: A fundamental tool of research. *Journal of Integrated Community Health*, 10(1), pp.6-10. DOI: <https://doi.org/10.24321/2319.9113.202101>

Menegaki, A.N., 2025. Powering Down Hospitality Through a Policy-Driven, Case-Based and Scenario Approach. *Energies*, 18(2), pp.1-36. DOI: <https://doi.org/10.3390/en18020328>

Merabet, G.H., Essaaidi, M., Haddou, M.B., Qolomany, B., Qadir, J., Anan, M., Al-Fuqaha, A., Abid, M.R. and Benhaddou, D., 2021. Intelligent building control systems for thermal comfort and energy-efficiency: A systematic review of artificial intelligence-assisted techniques. *Renewable and Sustainable Energy Reviews*, 144, p.110969. <https://arxiv.org/pdf/2104.02214>

Prideaux, B., Laws, E. and Faulkner, B., 2007. Events in Indonesia: Exploring the limits to formal tourism trends forecasting methods in complex crisis situations. In *Crisis management in tourism* (pp. 353-374). Wallingford UK: CABI.

Singh, A.B., Mishra, Y. and Yadav, S., 2024. Toward Sustainability: Interventions for Implementing Energy-Efficient Systems into Hotel Buildings. *Engineering Proceedings*, 67(1), p.80. DOI: <https://doi.org/10.3390/engproc2024067080>

The hotel journal, 2024. *The best eco-friendly hotels in the United Kingdom offer sustainable sanctuaries for every occasion*. Available at: <https://thehoteljournal.com/best-eco-friendly-hotels-united-kingdom-sustainable/> [Accessed on: 22-05-2025]

Velaoras, K., Menegaki, A.N., Polyzos, S. and Gotzamani, K., 2025. The role of environmental certification in the hospitality industry: Assessing sustainability, consumer preferences, and the economic impact. *Sustainability*, 17(2), p.650. DOI: <https://doi.org/10.3390/su17020650>

Vijayan, D.S., Koda, E., Sivasuriyan, A., Winkler, J., Devarajan, P., Kumar, R.S., Jakimiuk, A., Osinski, P., Podlasek, A. and Vaverková, M.D., 2023. Advancements in solar panel technology in civil engineering for revolutionizing renewable energy solutions—a review. *Energies*, 16(18), p.6579. DOI: <https://doi.org/10.3390/en16186579>