Transforming Hotels for a Sustainable Future

Noospatchaya Teekawatanasatitkul[1,2], Pathom Sawatmuang[1,2], Rohizaq Che Rose[1,2]

[1]IQRA Business School, University of Geomatika Malaysia, Kuala Lumpur, Malaysia

[2]Advanced Executive Management School, Bangkok, Thailand

ABSTRACT

The hotel industry is among the largest contributors to global environmental degradation, generating substantial energy consumption, carbon emissions, water usage, and food waste across its daily operations. While awareness of the need for sustainable practices has grown considerably among hotel operators, guests, and regulators alike, the challenge of translating institutional sustainability commitments into consistent human behaviour at the operational level remains poorly understood, particularly in the Southeast Asian context.

This study examined how sustainability practices are implemented, experienced, and perceived at Courtyard by Marriott Bangkok Suvarnabhumi Airport, a full-service hotel operating within one of the world's most established hotel chains. A qualitative, single-site case study design was adopted, drawing on in-depth semi-structured interviews with eleven hotel staff members spanning engineering, housekeeping, food and beverage, sales and marketing, and loss prevention, as well as one hotel guest. Data were analysed using Braun and Clarke's six-phase thematic analysis framework, producing five themes aligned with the study's research objectives: energy conservation, water management, carbon footprint measurement and awareness, food waste reduction and community donation, and employee motivation and sustainability culture.

The findings reveal that the hotel has built a genuinely sophisticated sustainability infrastructure, encompassing a Building Management System, wastewater recycling of approximately forty cubic metres per day, carbon intensity tracking through the Marriott Environmental Sustainability Hub (MESH), and a structured food donation partnership with the SOS Foundation. However, five significant findings emerged. First, a compliance gap of thirty to forty per cent persists among frontline staff despite advanced energy management technology, attributable to insufficient ongoing training and the absence of embedded sustainability workflows in most departments. Second, water conservation measures generated the most consistent staff engagement, driven significantly by a clear personal financial connection to service charge income. Third, carbon footprint awareness was almost entirely absent among frontline employees, representing a structural barrier to the collective ownership of carbon reduction targets. Fourth, the hotel's food donation programme proved to be its most emotionally resonant sustainability initiative, generating genuine pride across all departments, though food safety management in the post-kitchen logistics chain requires formalisation. Fifth, the current incentive and training framework is insufficient to engage the disengaged minority, and proposed gamification initiatives will require careful design to achieve lasting behavioural change.

The study contributes to Stakeholder Theory, Systems Theory, and the Triple Bottom Line framework by demonstrating that the most critical bottleneck in hotel sustainability management is neither technology nor policy, but the human and cultural layer of the workforce. Seven practical recommendations are offered, including the introduction of quarterly carbon literacy training, translation of MESH data into accessible narratives, formalisation of the food donation cold chain as a standard operating procedure, and exploration of a rooftop solar photovoltaic installation. The findings carry implications for hotel operators across Southeast Asia facing tightening environmental regulations and rising corporate client sustainability expectations.

Keywords: hotel sustainability, energy conservation, carbon literacy, food waste donation, employee engagement, qualitative case study, Thailand, Triple Bottom Line.

CHAPTER 1: INTRODUCTION

The hotel industry has a significant impact on the environment, particularly in the areas of maintenance and upkeep, such as pool cleaning and using power. As per a report published by the United Nations Environment Programme (2017). It is asserted that the global hotel industry consumes an average of over 1.3 billion cubic meters of water annually, which is 2-3 times the average household's water consumption. The utilization of electricity and transportation by hotels results in the emission of carbon dioxide. The primary source of this emission is frequent tourists who travel by transportation. The annual emissions of the tourism and hotel sector exceed 150 million tons of carbon dioxide (World Tourism Organization, 2021). General waste, food waste, and hazardous waste comprise the waste generated by hotel operations. More than 130 million tons of waste are produced annually by the hotel industry. Environmental impact can be mitigated through appropriate waste management (SGS, 2024). Furthermore, there is the matter of food waste. The hotel industry is responsible for the generation of approximately 30-40% of food waste from the food that is prepared. This amount has a negative impact on the environment when it is buried, as it produces methane gas that is harmful to the environment (Garrone et al., 2014). To a certain extent, the environmental impact can be mitigated by managing food waste in hotels (United Nations Food and Agriculture Organization, 2019).

Consequently, the concept of sustainability has emerged as a critical foundation for contemporary business operations, because of the growing apprehensions regarding environmental degradation, resource depletion, and climate change. The hotel industry is confronted with unique challenges in reconciling environmental responsibilities with customer expectations, as it is one of the largest contributors to global carbon emissions and resource consumption. The environmental impact of hotels is substantial, ranging from energy-intensive operations to water usage and food waste generation. Nevertheless, the increasing awareness of customers and tourists, as well as the introduction of more stringent regulatory frameworks in both the public and private sectors, requires hotels to implement sustainable practices that are consistent with their ecological and social objectives.

The objective of this research is to identify concrete strategies that hotels can implement to improve sustainability without compromising operational efficiency or customer satisfaction.

Overall, these elements contribute to the complexity and diversity of sustainability in the hotel industry. The research will be conducted by examining the operations of a hotel within the Marriott chain in Bangkok, as Marriott is considered a leading global hotel brand.

1.1 Background of the Study

This research concentrates on tangible strategies that hotels can implement to improve sustainability without sacrificing operational efficiency or customer satisfaction. These encompass the following: the reduction of energy consumption, the conservation of water, the measurement of carbon footprints, the reduction of food waste through donation programs. The diverse nature of sustainability in the hotel industry will be collectively impacted by all of these.

1.2 Problem statement

The hotel industry's substantial energy consumption, water usage, food waste, and carbon emissions are significant contributors to environmental degradation. Although there has been a rise in customer awareness and the implementation of more stringent regulatory frameworks by the government and business owners, numerous hotels continue to encounter challenges in reconciling operational efficiency, customer satisfaction, and sustainability.

For example, the consumption of water and carbon dioxide is substantial. When improperly managed, hazardous materials and food waste contribute to methane emissions and hotel's utilization of office supplies and paper.

Consequently, the research challenge is to identify practical and actionable strategies that can assist hotels in reducing their environmental impact without compromising operational efficiency or customer satisfaction.

1.3 Objectives

This study is guided by five primary objectives, each addressing a distinct dimension of hotel sustainability operations:

i. Energy Conservation: To identify and evaluate technologies and practices that reduce energy consumption and carbon emissions while maintaining operational efficiency and guest satisfaction.
ii. Water Conservation and Reuse: To examine the water management strategies employed by the hotel and assess their effectiveness in reducing consumption and supporting operational continuity without compromising the guest experience.

iii. Carbon Footprint Measurement and Reporting: To explore the systems and frameworks used by the hotel to measure, report, and offset its carbon footprint, including partnerships with external agencies and certification bodies.

iv. Food Waste Reduction through Donation: To investigate strategies for reducing food waste through structured donation programmes and evaluate their operational, social, and environmental outcomes.

v. Waste Recycling and Income Generation: To assess the effectiveness of waste separation and recycling initiatives in achieving sustainability goals while generating supplementary revenue for the hotel

1.4 Research questions

Below were the research questions of this study:

i. How can hotels reduce energy consumption while maintaining operational efficiency and guest satisfaction?

ii. How can hotels implement effective water conservation and recycling practices without compromising service quality?

iii. How can hotels accurately measure and report their carbon footprint, and what tools and partnerships support this process?

iv. How can hotels reduce food waste through donation programmes, and what are the operational and social outcomes of such initiatives?

v. How can waste separation and recycling programmes be designed to meet sustainability goals while generating income for the hotel

1.5 Justifications and significance of the study

This research is conducted to find practical approaches related to sustainability in the hotel industry, focusing on practices such as reducing energy consumption, water conservation, and food waste management. The research will incorporate theoretical approaches alongside practical methods. This study will help hotels improve operational efficiency and contribute to environmental conservation, while also reducing utility costs and increasing long-term profitability.

The importance of this research lies in the fact that nowadays, tourists, as well as large companies, especially those in the energy and industrial sectors, are increasingly seeking environmentally friendly accommodations. This study will help hotels meet the demands of consumers who desire sustainable practices, enhance customer satisfaction, and attract environmentally conscious customers. The outcomes of these operations and practices will lead to better profitability for hotel businesses, which is crucial for the recovery and growth of the hospitality industry, especially in the post-COVID-19 pandemic environment and the changing geographical landscape. Consequently, the expectations of consumers and tourists today are increasingly leaning towards environmentally friendly accommodations.

Consequently, consumer and tourist expectations are shifting towards more eco-friendly accommodations. This research focuses on approaches for hotels to participate in sustainable environmental conservation and methods to reduce energy consumption and carbon footprints by identifying operational practices and maintaining operational efficiency while reducing energy costs. This will help hotels remain competitive and find ways to manage food waste generated in hotels to reduce waste and improve the environment. Hotel businesses can link ethics and revenue generation, such as food distribution and waste segregation for resale. Therefore, operations related to reducing energy use and food waste can lead to significant cost savings for hotels. This research may lead to innovative practices that enhance sustainable conservation, reduce costs, and improve service quality in the future.

1.5.1 Theoretical contributions

This study enhances the understanding of sustainability management in the hospitality sector by utilising and expanding three fundamental theoretical frameworks. The theoretical contributions are structured as follows:

Below are some theoretical contributions of the study:

i. Stakeholder Theory (Freeman, 1984)
ii. Systems Theory (von Bertalanffy, 1968)
iii. Triple Bottom Line / TBL (Elkington, 1997)

1.5.1.1 Contribution to Stakeholder Theory

Stakeholder Theory asserts that organisations must generate value for all stakeholders, rather than exclusively for shareholders (Freeman, 1984). This research enhances Stakeholder Theory in the following manners:

a) Utilisation in the Context of Hotel Sustainable development. The theory of stakeholders is used in this study to look into how a hotel balances the interests of different stakeholder groups, including Hotel owners, staff, and managers are examples of internal stakeholders.

External stakeholders include visitors, the communities in question, government regulators, environmental organisations, and commercial partners (Marriott International).

b) identifying Trade-offs and Synergies for all stakeholders. The study shows how the needs of stakeholders are synergised through sustainable practices. For example, the following:

- Energy conservation reduces expenses, which helps executives and owners, and reduces the adverse impact on the environment and community.
- Food donation programs help local populations (benefiting society) while decreasing waste (benefiting the hotel).

c) Integration of Environmental Stakeholders to Stakeholder Theory

By proving that the environment actually can be regarded as a non-human stakeholder that needs to be taken into account.

1.5.1.2 Contribution to Systems Theory

Systems Theory posits that businesses function as interconnected systems that engage with their external environment (von Bertalanffy, 1968). This research enhances Systems Theory in the following manners:

a) Use of a Closed System Perspective in Hotel Management

This research employs a "closed system" framework to examine the functionality of a hotel's sustainability practices as a cohesive system. Some important connections are:

Saving energy ↔ Running the business more efficiently ↔ Making guests happy

Water reuse ↔ How much maintenance is needed ↔ How much money can be saved

Food waste management, donation programs, and community relations are all parts of this.

b) Comprehending Interdependencies in the Execution of Sustainability

The study shows how changes in one part of hotel operations affect other parts. For example, to use new energy-saving technologies, you need to train your staff (human resources), set aside money (finance), and talk to guests (marketing).

c) How the hotel system works with systems outside of the hotel

The study shows how the hotel works with systems outside of itself, such as:

- MESH, Marriott International's global sustainability platform
- Companies that handle trash and recycling in your area
- Groups in the community that collect food donations
- Government rules about the environment

1.5.1.3 Contribution to Triple Bottom Line (TBL) Theory

The Triple Bottom Line framework (Elkington, 1997) evaluates organisational performance through three dimensions: People (social), Planet (environmental), and Profit (economic). This study enhances TBL The theory in the following manners:

a) Utilising TBL to practice in the hotel business

This study provides a practical framework for hotels to apply TBL principles across various areas of operation, including:

- Saving energy

- Managing water
- Measuring your carbon footprint
- Less food waste
- Recycling waste

b) demonstrating how the TBL dimensions are connected to each other

The study demonstrates how the three TBL dimensions relate to hotel sustainability:

- People (Social) + Planet (Environmental): Food donation programs benefit the community and reduce waste at the identical time.
- Planet (Environmental) + Profit (Economic): Saving energy reduces utility costs and decreases down on carbon emissions.
- People (Social) + Profit (Economic): Having employees involved in sustainability results in them being happier at work and reduces the costs of turnover.

c) The addition of long-term value creation to TBL

This study improves TBL theory by demonstrating how sustainability practices produce lasting benefits beyond instant financial advantages, encompassing:

- More Effective reputation over the brand
- Customers that are concerned about the environment are loyal.
- Improved connections with stakeholders
- Following the rules and lowering risk

1.5.2 Practical contributions

This study provides numerous practical contributions that can be directly utilised by hotel operators, managers, and industry professionals. The practical contributions are arranged as follows:

1.5.2.1 Energy Saving Guidelines for Hotels

This study provides practical energy-saving suggestions that hotels may implement, based on the practices observed at Marriott Airport Hotel. These guidelines have been organised by type:

a) Energy-saving measures determined by technology

- Key Card Energy Management Systems: Set up key card systems that turn off the power when guests leave the room.
- LED Lighting: Change out all of the incandescent and fluorescent bulbs over LED lights which consume less energy.
- Variable Frequency Drives (VFDs): Put VFDs on HVAC systems for making certain that motors function optimally whenever they are necessary.

- Building Management System (BMS): Apply systems that record energy consumption in real time to keep records of and improve how energy is used.
- Motion Sensors: Install motion sensors in areas with little pedestrian traffic, like hallways,staff's restrooms, and storage rooms.
- Water Recycling

b) Methods of conducting company

Daily Energy Monitoring: Verify utility meters each day to identify problems as well as keep track of the amount of energy has been consumed.

Preventive Maintenance: Make sure that HVAC systems, insulation, and electrical equipment have regular upkeep to maintain individuals functioning at their peak performance.

Training to Staff: instruct staff members why to preserve energy on a regular basis, such as by switching off equipment when it's not in use.

Guest Engagement: Tell guests of the conservation rules in a way that encourages them involved without becoming uncomfortable.

c) Guidelines for implementing to execution

Phased Approach: In order to maintain initial costs decrease, implement energy-saving measures to place over several stages.

ROI Calculation: The figure out the time it requires for each technology to pay for its own expenditure, and then put the cash into the technologies that will pay off the fastest.

Monitoring performance: Set up key performance indicators (KPIs), such as the amount of energy consumed per occupied room, to keep track of progress.

The practical contributions of the present study are as follows:

i. Energy saving guidelines for hotels.
ii. Reduce hotels operating costs.
iii. Hotel sustainability system and outcomes.

1.5.3 Contribution to methodology

This study makes a meaningful contribution to research methodology by demonstrating the value of a qualitative, single-site case study approach in examining sustainability practices within the hotel industry. Rather than relying on large-scale quantitative surveys that measure surface-level attitudes or aggregate performance metrics, this research employs in-depth semi-structured interviews with participants drawn from

multiple departments and seniority levels within one property. This methodological choice enables the study to move beneath the institutional language of policy documents and sustainability reports, capturing instead the lived experiences, perceptions, and practical knowledge of the people who implement sustainability practices on a daily basis.

The selection of Marriott Airport Hotel as the research site is itself a methodological contribution. As a property operating within one of the world's most established hotel chains, the case offers a context in which formal sustainability infrastructure, including proprietary measurement systems, certified frameworks, and corporate environmental targets already exists. This makes it possible to examine not merely whether sustainability systems are in place, but how effectively they translate into human behaviour, organisational culture, and operational outcomes. The gap between designed policy and lived practice, which this study identifies as a central finding, would not be visible through quantitative methods alone.

Furthermore, the use of thematic analysis to interpret interview data allows patterns and contradictions to emerge directly from participants' own accounts, rather than being imposed through predetermined categories. This inductive approach is particularly well suited to a field such as hotel sustainability management, where operational realities vary considerably across properties, cultures, and staff populations. The findings generated through this methodology are therefore not only applicable to the specific case studied but offer transferable insights for researchers and practitioners investigating similar questions in comparable hospitality contexts across Southeast Asia and beyond.

Chapter Summary

The hotel industry faces mounting pressure to align its operations with the principles of sustainable development, driven by evolving regulatory requirements, shifting consumer expectations, and growing awareness of the sector's environmental footprint. Against this backdrop, the present study seeks to identify practical and actionable sustainability strategies that hotels can adopt without sacrificing operational efficiency or the quality of the guest experience.

This chapter has established the foundations of the research by setting out its background, problem statement, objectives, and research questions. The study is guided by five objectives encompassing energy conservation, water management, carbon footprint measurement and reporting, food waste reduction through donation programmes, and waste recycling for income generation. These objectives are addressed through five corresponding research questions, ensuring a coherent and traceable line of inquiry throughout the study.

The significance of the research has been examined from three perspectives. Theoretically, the study draws on and extends three established frameworks Stakeholder Theory (Freeman, 1984), Systems Theory (von Bertalanffy, 1968), and the Triple Bottom Line (Elkington, 1997) to analyse how sustainability practices in hotels create value across environmental, social, and economic dimensions simultaneously. Practically, the research offers concrete guidelines for hotel operators seeking to reduce costs, improve sustainability performance, and respond to the expectations of environmentally conscious guests and corporate clients.

Methodologically, the adoption of a qualitative single-site case study approach contributes a depth of understanding that quantitative methods cannot readily achieve, revealing the human and cultural dimensions of sustainability implementation that often remain invisible in performance data alone.

The subsequent chapter builds on these foundations by reviewing the existing literature on sustainability in the hotel industry, situating this research within current academic debates and identifying the gaps that the study is designed to address.

CHAPTER 2: LITERATURE REVIEW

Aims of The Literature Review Chapter

This chapter critically reviews the academic literature relevant to sustainability management in the hotel industry, with particular attention to energy conservation, water management, carbon footprint measurement, food waste reduction, and employee engagement in sustainable practices. The review draws on peer-reviewed research from Thailand and the wider Southeast Asian region alongside international scholarship, and situates the study within three theoretical frameworks Stakeholder Theory (Freeman, 1984), Systems Theory (von Bertalanffy, 1968), and the Triple Bottom Line (Elkington, 1997) that together provide the conceptual foundation for the analysis presented in subsequent chapters. The chapter concludes by identifying the gaps in existing research that this study is designed to address, and by presenting the research propositions that guide the qualitative inquiry.

2.1 Demonstrate Knowledge and Understanding:

The concept of sustainability in commercial operations emerged prominently in the late twentieth century following the Brundtland Commission's landmark definition of sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987). In the decades since, this principle has been adopted and adapted across industries, with the hospitality sector facing particular scrutiny given its considerable consumption of energy, water, and food resources at scale.

The hotel industry's environmental footprint is well documented. (Bohdanowicz and Martinac, 2007) established that hotels in Europe and North America consume between 100 and 400 kilowatt-hours of electricity per square metre annually, with air conditioning and heating systems accounting for the majority of this consumption. In tropical climates such as Thailand, the cooling load is even more significant, making energy management one of the most pressing operational sustainability challenges for hotel operators in (Southeast Asia. Kasim, 2009) found that hotels in Malaysia are a closely comparable market to Thailand in terms of climate, tourism dependency, and regulatory environment frequently acknowledged the importance of environmental management while struggling to move beyond superficial, cost-driven measures towards genuinely integrated sustainability practice.

Within Thailand specifically, the Green Hotel initiative, promoted by the Ministry of Natural Resources and Environment, has driven measurable improvements in energy and water efficiency across a range of properties since its introduction in the early 2000s. (Wongsaichia et al, 2021) examined Green Hotel-certified properties in Bangkok and found that certification was associated with statistically significant reductions in electricity and water consumption per guest night, but that the depth of staff understanding of sustainability goals remained limited, particularly among frontline workers with lower levels of formal education. This finding is directly relevant to the present study, which similarly identifies a gap between institutional sustainability performance and individual employee understanding at the case study property.

The relationship between sustainability and business performance in hotels has also attracted considerable academic attention. (Chan et al,2014) conducted a longitudinal study of hotels in Hong Kong and found that investment in environmental management systems yielded measurable cost savings within three years in over eighty per cent of cases, primarily through reductions in energy and water expenditure. Critically, they also found that hotels with strong internal sustainability cultures characterised by active staff participation rather than top-down compliance outperformed those relying primarily on technology, suggesting that human factors are at least as important as physical infrastructure in determining sustainability outcomes. This insight forms a central argument of the present research.

Food waste represents a further significant dimension of hotel environmental impact. (Garrone et al, 2014) estimated that hotels and food service operations account for approximately thirty to forty per cent of total food waste in the hospitality and food supply chain, with buffet-format dining generating disproportionately high volumes of surplus food relative to à la carte service. In Thailand, (Papargyropoulou et al, 2014) applied a food waste hierarchy framework to the hospitality sector and argued that prevention reducing overproduction at the kitchen level is significantly more environmentally beneficial than redistribution or recycling, a finding that is reflected in the present study's observation that the case study hotel's declining donation volumes may indicate upstream production improvements rather than reduced community engagement.

2.2 Research Context Sustainability Practices in Southeast Asian Hotels

The hospitality industry in Southeast Asia operates within a distinctive set of environmental, regulatory, and cultural conditions that shape how sustainability principles are translated into practice. The region's rapid tourism growth over the past two decades has placed considerable pressure on natural resources, particularly water and energy, in destinations ranging from Bangkok and Bali to Kuala Lumpur and Ho Chi Minh City. At the same time, regulatory frameworks governing environmental performance in the hotel sector have developed unevenly across the region, with some countries notably Singapore and Malaysia introducing more prescriptive requirements than others (Mensah, 2006).

In Thailand, the regulatory environment relevant to hotel sustainability is evolving. The government's national greenhouse gas reduction targets, set under Thailand's Nationally Determined Contribution to the Paris Agreement, commit the country to reducing emissions by twenty to twenty-five per cent below 2005 levels by 2030. Mandatory greenhouse gas reporting legislation for commercial operators, including hotels, was in draft form at the time of this research, with implementation expected around 2030. This regulatory trajectory makes the present study timely: hotels that build robust measurement and reporting systems now will be significantly better positioned when compliance requirements come into force.

International hotel chains operating in Thailand occupy a particularly interesting position in this context. As subsidiaries of global corporations with their own sustainability commitments and reporting obligations, they are subject to both host-country regulations and headquarters-level environmental targets. Marriott International, for instance, operates a proprietary sustainability platform the Marriott Environmental Sustainability Hub (MESH) that standardises energy, water, and waste data collection and reporting across its global portfolio. Research by (Holcomb et al.,2007) found that large international hotel chains were more likely than independent operators to have formalised sustainability management systems, but were not necessarily more successful in translating those systems into staff behavioural change at the property level, a tension that the present study explores in considerable depth.

The cultural dimension of sustainability in Southeast Asian workplaces also warrants attention. (Pongsakornrungsilp and Schroeder, 2011) noted that Thai organisational cultures tend to favour hierarchical decision-making and deference to managerial authority, which has implications for how sustainability initiatives are communicated and adopted by frontline workers. Where sustainability is framed as a top-down compliance requirement rather than a shared value, employee engagement tends to be superficial and difficult to sustain. Conversely, where employees are given the knowledge, the language, and the agency to understand why sustainability matters, the research suggests that intrinsic motivation can be a powerful driver of behavioural change, a pattern that is clearly visible in the food donation programme described in this study's findings.

2.3 Evaluate and synthesise existing research

A review of the existing literature reveals several recurring themes alongside persistent gaps that this study is positioned to address.

Energy management is the most extensively researched dimension of hotel sustainability. (Himeur et al., 2023) found that Building Management Systems (BMS) reduced energy consumption by between fifteen and thirty per cent in large hotels, with the greatest savings realised when automated systems were combined with active staff training programmes. (Mensah,2006) similarly found that technology alone was insufficient to sustain energy reductions over time, as staff behaviours particularly in areas not covered by automation, such as back-of-house offices and staff changing rooms continued to account for a significant proportion of avoidable consumption. These findings are consistent with the compliance gap identified in the present study,

where an estimated thirty to forty per cent of staff were not consistently observing energy-saving protocols despite the presence of sophisticated automated systems.

Water conservation in hotels has received somewhat less academic attention than energy, but the existing literature is clear on the effectiveness of technical interventions. (Deng & Burnett, 2002) demonstrated that sensor-activated taps, dual-flush toilets, and flow-restricted showerheads could collectively reduce water consumption by between twenty and thirty-five per cent in hotel guestrooms without measurable impact on guest satisfaction. The importance of wastewater recycling for non-potable uses such as irrigation, cooling tower make-up water, and toilet flushing has been highlighted by several authors as a high-impact, cost-effective intervention in water-scarce or water-expensive environments ((Hayden et al., 2012).

Carbon footprint measurement in hotels is a comparatively recent area of academic inquiry, reflecting the broader shift in corporate sustainability discourse from operational efficiency to emissions accounting. (Gössling et al.,2010) argued that the hotel sector had been slow to develop standardised carbon measurement frameworks, resulting in significant inconsistencies in how properties calculated and reported their emissions. The development of tools such as Marriott's MESH platform represents a significant advance in this regard, providing a standardised methodology for carbon intensity calculation across a large and geographically diverse portfolio. However, as (Whitmarsh et al..2011) noted in the context of public engagement with carbon, measurement systems are of limited value if the people responsible for the behaviours that drive emissions do not understand the concept of carbon footprint. This gap between institutional measurement capacity and individual carbon literacy is a central finding of the present study.

Employee pro-environmental behaviour has emerged as an important field of inquiry within the broader organisational behaviour literature. (Edrisi et al., 2021) distinguished between task-related pro-environmental behaviours those formally required by the job and discretionary pro-environmental behaviours those that employees choose to perform beyond their formal obligations. Their research found that the latter category was more strongly associated with sustained environmental outcomes and was most effectively cultivated through a combination of environmental values, managerial modelling, and organisational support. (Robertson & Barling, 2013) extended this framework, finding that leaders who demonstrated visible personal commitment to sustainability generated significantly higher levels of discretionary pro-environmental behaviour among their teams. These insights provide a theoretical basis for the present study's finding that sustainability culture at the case study property is strongest in departments notably housekeeping where sustainability behaviours are embedded in formal SOPs and modelled by supervisors, and weakest where they depend on individual initiative alone.

Food waste and community donation programmes have been examined in the context of both environmental impact and corporate social responsibility. (Papargyropoulou et al., 2014) argued for a hierarchical approach to food waste management, in which prevention takes priority over redistribution, which in turn takes priority over recycling or disposal. (Schanes et al., 2018) found that food donation programmes in the hospitality sector

generated significant social value but required careful logistical management to avoid food safety risks, particularly in warm climates. The emotional dimension of food donation, its capacity to generate staff pride and organisational identity has received less academic attention, making the present study's findings on this point a modest but genuine contribution to the literature.

Despite the breadth of existing research, several gaps remain. First, the literature on carbon literacy among hotel employees as distinct from carbon measurement by hotel management is sparse, and no study identified in this review has examined it systematically in the Thai or Southeast Asian context. Second, the interaction between formal sustainability infrastructure and informal organisational culture in determining sustainability outcomes has been identified as important but remains underexplored at the property level. Third, the role of CSR activities in building sustainability culture among employees rather than primarily serving external communication purposes is an emerging area that warrants further investigation. The present study addresses all three of these gaps through its qualitative, single-site case study design.

2.4 Develop a theoretical framework, hypothesis and conceptual model

Theoretical Framework

Three theoretical frameworks provide the conceptual foundation for this research. Each is described below in terms of its core propositions and its specific relevance to the study's research questions.

Stakeholder Theory (Freeman, 1984) holds that organisations are responsible not only to their shareholders but to all parties who are affected by or have a legitimate interest in their activities. In the context of hotel sustainability, this framework directs attention to the full range of stakeholders whose interests must be considered and balanced: hotel owners and investors who require financial returns; employees whose welfare and working conditions are affected by operational decisions; guests whose experience is shaped by sustainability measures; local communities who benefit from food donation and CSR activities; environmental regulators who set compliance requirements; and the natural environment itself, which Freeman's later work acknowledges as a non-human stakeholder deserving of moral consideration (Freeman et al., 2010). This study applies Stakeholder Theory to examine how the case study hotel navigates the competing and complementary interests of these groups in the design and implementation of its sustainability programme.

Systems Theory (von Bertalanffy, 1968) holds that organisations function as open systems composed of interdependent subsystems, each of which affects and is affected by the others and by the external environment. This framework is particularly valuable for understanding sustainability management in hotels because sustainability initiatives rarely affect only one area of operations. An energy-saving policy introduced in the facilities management subsystem may create unintended consequences in the human resources subsystem as the late-evening air conditioning cut-off policy described in this study's findings illustrates. Systems Theory

alerts the researcher to these interdependencies and provides a conceptual vocabulary for tracing how sustainability interventions ripple through the organisation in ways that linear, single-variable analyses cannot capture.

The Triple Bottom Line (TBL) framework (Elkington, 1997) proposes that organisational performance should be evaluated across three dimensions simultaneously: People (social impact), Planet (environmental impact), and Profit (economic impact). In the context of this research, the TBL framework provides a structure for assessing the case study hotel's sustainability practices not merely in terms of environmental metrics, energy consumption, water usage, and waste volumes. but also in terms of their social consequences for employees and the community, and their economic implications for the hotel's operating costs and competitive positioning. The TBL framework also draws attention to the interactions between these three dimensions, which are often as important as the dimensions themselves: food donation, for example, simultaneously serves the People dimension (community welfare), the Planet dimension (food waste reduction), and the Profit dimension (reduced waste disposal costs and enhanced brand reputation).

Research Propositions

In keeping with the qualitative nature of this study, the research is not guided by testable hypotheses in the quantitative sense. Instead, the following research propositions are offered as exploratory orientations that frame the inquiry and guide the interpretation of data, consistent with the approach recommended by (Maxwell, J.a.2013) for qualitative case study research.

Proposition 1: Hotels that have invested in sophisticated energy management technology will nonetheless experience a gap between designed energy-saving capacity and actual staff behaviour, owing to insufficient training and the absence of embedded sustainability workflows in non-operational departments.

Proposition 2: Water conservation measures that demonstrate a direct and visible connection to employee financial benefit — through reduced operating costs and higher service charges — will generate stronger and more consistent staff compliance than measures framed solely in environmental terms.

Proposition 3: Carbon footprint literacy among frontline hotel staff will be significantly lower than among management-level staff, representing a structural barrier to collective ownership of carbon reduction targets.

Proposition 4: Food donation programmes generate organisational value that extends beyond their environmental impact, cultivating staff pride, cross-departmental solidarity, and a sense of institutional identity that reinforces broader sustainability engagement.

Proposition 5: The effectiveness of sustainability incentive schemes in hotels is determined less by their monetary value than by their perceived fairness, the tightness of the feedback loop between behaviour and reward, and their integration with existing performance management systems.

Conceptual Model

The conceptual model for this study positions the hotel as an open system consistent with Systems Theory in which five operational sustainability domains (energy, water, carbon, food waste, and recycling) interact with three stakeholder dimensions (environmental, social, and economic) as defined by the Triple Bottom Line framework. The interests and engagement of multiple stakeholder groups, employees, guests, management, community partners, and regulators mediate the relationship between sustainability policy design and operational sustainability outcomes. This model reflects the understanding that sustainability in hotel operations is not a linear process of policy implementation but a dynamic and relational one, shaped by human behaviours, organisational culture, and the complex interdependencies between operational subsystems.

Chapter Summary

This chapter has reviewed the academic literature relevant to sustainability management in the hotel industry, situating the present research within an established body of scholarship while identifying the specific gaps that the study is designed to address. The review has demonstrated that energy management, water conservation, carbon measurement, food waste reduction, and employee engagement are all areas of active research, but that the interactions between institutional sustainability infrastructure and individual employee behaviour particularly in the Thai and Southeast Asian context remain underexplored. Three theoretical frameworks Stakeholder Theory, Systems Theory, and the Triple Bottom Line have been presented as the conceptual foundation for the study, and five research propositions have been formulated to guide the qualitative inquiry. The following chapter sets out the research methodology through which these propositions are explored and the data from which the study's findings are drawn.

CHAPTER 3: METHODOLOGY

3.1 Research Design

This study adopts a qualitative research approach, employing an exploratory case study design to examine how sustainability practices are implemented, experienced, and perceived within a hotel operating environment. The purpose of the research is to explore and develop a deeper understanding of how the hotel industry is adapting its operations to meet sustainability objectives, with particular attention to the human, cultural, and organisational dimensions of that adaptation. This approach is appropriate because it allows the researcher to gather rich, contextually grounded data from staff and guests at Marriott Airport Hotel, capturing the lived experiences, attitudes, and practical knowledge of those who engage with sustainability policies on a daily basis.

A qualitative design was selected in preference to a quantitative approach because the central research questions concern meaning, process, and experience rather than numerical measurement. The study does not seek to test relationships between variables or to produce generalisable statistical findings; it seeks instead to produce an in-depth, contextually sensitive account of how sustainability is practised and understood within one specific organisational setting. This is consistent with the case study methodology advocated by (Yin, 2018) who argues that case studies are particularly well suited to research questions that ask how and why things happen within real-world contexts that cannot be separated from the conditions in which they occur.

The single-site case study design reflects a deliberate methodological choice. Marriott Airport Hotel was selected because it operates within an established global sustainability framework Marriott International's proprietary MESH platform while also being subject to the specific operational, cultural, and regulatory conditions of the Thai hospitality market. This combination makes it an information-rich case that offers both practical specificity and broader analytical relevance for hotel operators in Southeast Asia and beyond.

3.2 Research Methods and Data Collection Procedures

3.2.1 In-Depth Semi-Structured Interviews

The primary method of data collection was in-depth semi-structured interviewing. A total of twelve participants were recruited, drawn from multiple departments and seniority levels within the hotel, as well as one hotel guest. Participants were selected to represent a range of perspectives on sustainability practices: from the engineering and facilities staff responsible for managing energy and water systems, to the housekeeping and food and beverage teams who implement waste and resource-conservation protocols in their daily work, to the management-level staff who design, communicate, and monitor sustainability policies. One hotel guest was included to provide an external perspective on the visibility and impact of sustainability measures on the guest experience.

Participants were identified and approached using purposive convenience sampling. This approach was appropriate given the study's objective of capturing a diverse range of departmental and seniority-level perspectives, while working within the practical constraints of access to a single property. Participants ranged from Level 6 operational staff to Level 1 executive positions, ensuring that the data reflects both the ground-level experience of frontline workers and the strategic perspective of senior management. Participant identities have been protected throughout the study; all individuals are referred to by anonymised codes (P1 through P12) in the analysis and findings chapters.

Interview questions were developed from the five research objectives and five research questions set out in Chapter One, and were organised around the five sustainability themes central to the study: energy conservation, water management, carbon footprint awareness, food waste reduction, and employee motivation and engagement. The semi-structured format allowed the researcher to follow a consistent line of inquiry across all participants while also creating space for participants to raise issues and perspectives that had not been anticipated in the interview guide. This flexibility is a recognised strength of semi-structured interviewing in qualitative research, as it allows the data to surface unexpected but analytically important material (Bryman, 2016).

3.2.2 Data collection procedures.

Prior to data collection, the hotel management was contacted formally to explain the research objectives and to request cooperation from relevant staff and stakeholder groups. Written consent was obtained from all participants before each interview commenced, and participants were informed of their right to withdraw from the study at any point without consequence. All interviews were conducted at a time and location convenient to the participant, primarily within the hotel premises, and were audio-recorded with the explicit permission of each participant in accordance with the requirements of Thailand's Personal Data Protection Act (PDPA). Recordings were stored securely on password-protected devices accessible only to the researcher.

In addition to the interview data, the researcher conducted direct observation of selected hotel operations during site visits, including waste segregation practices in the kitchen and back-of-house areas, energy management procedures in the engineering department, and the food donation handover process. Observational notes were recorded in a field diary and used to contextualise and triangulate the interview findings, consistent with the methodological practice recommended by (Creswell & Poth, 2018) for qualitative case study research.

Interview audio recordings were transcribed verbatim using Transkriptor, a digital transcription tool, and subsequently reviewed and corrected by the researcher to ensure accuracy. All transcripts were translated from Thai into English by the researcher, who is a native Thai speaker with professional proficiency in English, and were reviewed for consistency before analysis commenced.

3.3 Ethical Considerations

3.3.1 Potential Ethical Concerns

The primary ethical concerns associated with this study relate to the collection and handling of personal and commercially sensitive information. Interviews with hotel staff necessarily involved discussion of internal operational practices, management decisions, and individual attitudes information that could, if improperly disclosed, affect participants' professional standing or the hotel's commercial interests. To address these risks, the study was designed with participant confidentiality and data security as foundational principles.

3.3.2 Informed Consent and Participant Rights

All participants were fully informed of the study's purpose, the nature of the questions to be asked, how the data would be used, and their right to decline to answer any question or to withdraw from the study at any stage without penalty. Informed consent was obtained in writing prior to each interview. Participants were assured that their individual responses would not be attributed to them by name in any published or submitted version of the research, and that all data would be stored securely and used solely for academic purposes. The hotel's proprietary operational information has been treated with equivalent care: commercially sensitive details have been presented at a level of generality that protects the organisation's interests while preserving the analytical value of the findings.

3.3.3 Ethical Approval

This research received approval from the Ethics Committee of the University of Geomatika Malaysia prior to the commencement of data collection. Documentation confirming compliance with the institution's ethical standards and research governance regulations was provided to the hotel management before interviews began.

3.4 Data Analysis Techniques

3.4.1 Thematic Analysis

Interview transcripts and observational field notes were analysed using (Braun & Clarke, 2006) six-phase thematic analysis framework, which is widely recognised as a rigorous and systematic approach to identifying, analysing, and reporting patterns of meaning within qualitative datasets. The six phases familiarisation with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final analysis were followed iteratively rather than sequentially, with the researcher moving back and forth between phases as the analytical picture developed.

In the first phase, all twelve transcripts were read in full multiple times to develop a thorough familiarity with the data before any coding began. Initial codes were then generated by systematically working through each transcript and assigning descriptive labels to segments of data that were relevant to the research questions. These codes captured both the content of what participants said and the manner in which they said it including

emotional tone, expressions of uncertainty, and moments of spontaneous reflection consistent with the interpretive approach recommended by (Braun & Clarke, 2006) for reflexive thematic analysis.

In subsequent phases, initial codes were grouped into candidate themes, which were then reviewed against the full dataset to ensure that they accurately represented the range and nuance of the data rather than reflecting only the most prominent or easily codified responses. Five final themes emerged from this process, each corresponding to one of the study's five research objectives: energy conservation, water management, carbon footprint measurement and awareness, food waste reduction and community donation, and employee motivation and sustainability culture. These themes are presented and analysed in detail in Chapter Four.

3.4.2 How Thematic Analysis Addresses the Research Questions

The application of thematic analysis to the interview and observational data provides a structured means of addressing each of the study's five research questions.

Research Question 1: *How can hotels reduce energy consumption while maintaining operational efficiency and guest satisfaction?*is addressed through themes relating to the design and management of energy-saving technologies, the compliance behaviours of staff, and the guest experience of energy-related interventions. Thematic analysis makes it possible to identify not only what practices are in place but how they are received and where they fall short.

Research Question 2: *How can hotels implement effective water conservation and recycling practices without compromising service quality?* is addressed through themes concerning the hotel's closed-loop water management system, staff attitudes towards conservation measures, and the relationship between water saving and staff financial incentives.

Research Question 3: *How can hotels accurately measure and report their carbon footprint, and what tools and partnerships support this process?* is addressed through themes relating to the MESH platform, the South Pole partnership, and the critical finding that carbon literacy among frontline staff is almost entirely absent, representing a structural barrier to collective carbon reduction.

Research Question 4: *How can hotels reduce food waste through donation programmes, and what are the operational and social outcomes of such initiatives?* is addressed through themes concerning the two-stream food waste management system, the logistics and safety of the donation programme, and the emotional significance of food donation for staff identity and motivation.

Research Question 5: *How can waste separation and recycling programmes be designed to meet sustainability goals while generating income for the hotel?* is addressed through themes relating to the hotel's recycling revenue streams, the current limitations of staff waste separation behaviour, and the design considerations for effective incentive schemes

3.5 Validity, Reliability, and Trustworthiness of the Research

In qualitative research, the concepts of validity and reliability are understood differently from their quantitative counterparts. (Lincoln et al., 1985) propose four criteria for evaluating the trustworthiness of qualitative findings: credibility, transferability, dependability, and confirmability. Each of these criteria has been addressed in the design and conduct of this study.

Credibility, the qualitative equivalent of internal validity, was enhanced through methodological triangulation, combining interview data with direct observation and, where available, documentary evidence from the hotel's sustainability reporting. Member checking was applied informally during interviews, with the researcher summarising key points back to participants to verify the accuracy of the interpretation. The use of participant codes and verbatim translation further strengthens the credibility of the findings by keeping the analysis anchored in participants' own words.

Transferability, the qualitative equivalent of external validity, is supported by the provision of a rich, detailed description of the research context, the participant sample, and the data collection conditions. While the findings of a single-site case study cannot be statistically generalised to other settings, the depth of contextual description provided enables readers to assess the degree to which the findings may be relevant to comparable hotel properties in similar operational contexts, consistent with the concept of naturalistic generalisation described by (Stake R 1995 The Art Of Case Study Research, n.d.)

.

Dependability, the qualitative equivalent of reliability, is addressed through the use of a consistent, semi-structured interview guide across all participants, and through the systematic application of Braun and (Ahmed et al., 2025) thematic analysis framework, which provides a documented and replicable analytical procedure.

Confirmability, the qualitative equivalent of objectivity, is addressed through the researcher's reflexive awareness of their own position as a researcher with professional experience in the Thai hospitality sector. This insider knowledge was a valuable asset in interpreting the data; however, it also carries the risk of confirmation bias. This risk was mitigated by remaining open to findings that contradicted initial expectations including, for example, the uniformly negative finding on carbon literacy, which was more widespread than anticipated and by grounding all analytical claims in specific, attributable data from the transcripts.

Social desirability bias the tendency for participants to present their attitudes and behaviours in a more positive light than reality was mitigated by conducting interviews in a private setting, emphasising confidentiality, and framing questions in ways that invited honest reflection rather than evaluation. The use of convenience sampling, while a practical necessity in a single-site study, introduces the limitation that participants who agreed to be interviewed may have been more engaged with sustainability issues than those who did not. This limitation is acknowledged and discussed further in Chapter Five.

Chapter Summary

This chapter has set out the methodological foundations of the research. The study adopts a qualitative, exploratory case study design, employing in-depth semi-structured interviews with twelve participants and direct observation as its primary data collection methods. The research was conducted at Courtyard by Marriott Bangkok Suvarnabhumi Airport and was designed to explore, rather than measure, how sustainability practices are implemented and experienced within the hotel. Ethical considerations were addressed through informed consent, participant confidentiality, and institutional ethical approval. Data were analysed using Braun and Clarke's (2006) six-phase thematic analysis framework, producing five themes that correspond directly to the study's research questions and objectives. The trustworthiness of the findings was strengthened through triangulation, consistent application of the analytical framework, and reflexive attention to potential researcher bias. The following chapter presents the findings that emerged from this process.

CHAPTER 4: FINDINGS AND ANALYSIS

4.1 Introduction

This chapter presents the findings emerging from in-depth semi-structured interviews conducted with eleven members of staff at Marriott Airport Hotel (hereafter referred to as the hotel) and one hotel guest. The participants spanned multiple departments including engineering, housekeeping, food and beverage, sales and marketing, and loss prevention and ranged from frontline operational staff to department heads and members of the hotel's sustainability committee. Together, their accounts offer a rich, ground-level portrait of how the hotel's sustainability commitments translate into daily practice: where those commitments take root with genuine conviction, where meaningful gaps persist, and where individual employees contribute ideas and energy that go well beyond the minimum their roles require.

The data are organised around five interconnected themes that correspond directly to the five research objectives and research questions set out in Chapter One: energy conservation, water management, carbon footprint awareness and measurement, food waste reduction and community donation, and employee motivation and sustainability culture. Within each theme, the analysis moves between what management has designed and what frontline staff actually experience, drawing out the tensions, the alignments, and the moments of pride or frustration that define sustainability as a lived reality rather than a policy document. All interviews were conducted in Thai and translated into English by the researcher. Quotations are attributed to participants by their assigned codes (P1 through P12). Where brief direct translations are provided, these have been reviewed for accuracy and lightly edited for readability while preserving the participant's original meaning. Participant names and identifying details remain confidential throughout.

4.2 Theme 1: Strategies for Energy Conservation and Operational Efficiency

4.2.1 The Technology Layer: Systems That Work Quietly in the Background

At Marriott Airport hotel, the pursuit of energy efficiency rests on a sophisticated infrastructure that operates largely without staff needing to think about it. The Building Management System (BMS), supplied in partnership with Schneider Electric, automates the scheduling and temperature calibration of the hotel's air conditioning units across all public and back-of-house areas. Given that between sixty and seventy per cent of the hotel's total energy expenditure is attributable to cooling systems, a figure consistent with the tropical climate of Bangkok, this level of automation carries enormous financial and environmental significance. The BMS sets the central chiller temperature to a baseline of 22–23 degrees Celsius, with the source temperature calibrated slightly lower at 21.5 degrees to account for the thermal load generated by guests and equipment in occupied spaces.

Alongside the BMS, the hotel operates a separate lighting control system that allows facility staff to dim or extinguish LED fixtures across different zones according to time-of-day schedules. Early mornings and late evenings see reduced lighting intensity in corridors and staff areas, with full illumination activated during peak occupancy hours. This is supplemented by motion-sensor lighting in selected back-of-house areas, including some staff restrooms and storage rooms, though the rollout of sensors across the full staff estate was, at the time of the interviews, still approximately thirty to forty per cent complete.

Energy consumption data is captured daily by engineering staff who manually record kilowatt-hour readings from sub-meters installed across different areas of the building retail outlets, chiller plant rooms, and office wings. This data feeds into the MESH system (Marriott Environmental Sustainability Hub), a proprietary corporate platform that calculates a key performance indicator known as Energy Intensity per Occupied Room. The hotel sets annual reduction targets of between two and five per cent and monitors progress monthly, enabling management to identify anomalies and intervene before inefficiencies compound.

The hotel also benefits from a Time-of-Use (TOU) electricity tariff structure, under which the cost per kilowatt-hour varies by time of day. On-peak periods roughly 5:00 PM to 7:00 PM on weekdays attract significantly higher rates, and the engineering team consciously shifts energy-intensive operations away from these windows wherever possible. Ballroom air conditioning, for instance, is brought online gradually rather than all at once, reducing peak demand charges while maintaining guest comfort by the time events begin.

4.2.2 Participant Demographics

The study involved a total of twelve participants. Table 4.1 presents the demographic profile of those interviewed, including their departmental affiliation, organisational level, and years of experience. Participants were selected to ensure a breadth of perspectives across departments and seniority levels. It should be noted that P1 serves as a member of the hotel's Sustainability Committee and contributes primarily a policy and governance perspective, while P2, although originally listed under the same grouping, holds a senior engineering role and was interviewed principally for their technical expertise in energy and water systems

management. This distinction is clarified here to prevent any ambiguity in the analysis that follows, where P2's contributions relate specifically to engineering operations rather than sustainability committee governance.

Table 4.1: Participant Demographics

Participant Code	Position / Department	Level	Year of Experience
P1	Sustainability Committee Member	Middle Management	10+
P2	Engineering (Senior)	Department Head	10+
P3,P4,P5	Sales & Marketing	Management	5+
P6,P7	Food & Beverage	Operational	5+
P8,P9	Housekeeping	Operational	10+
P10	Engineering	Department Head	10+
P11	Loss & Prevention	Operational	5+
P12	Guest	Customer	N/A

Please note that the names of the participants have been kept secret. This chapter uses codes to identify participants.

4.2.3 *The Human Layer: Staff Experience and the Compliance Gap*

Despite the sophistication of the hotel's energy management infrastructure, the interviews revealed that a meaningful compliance gap persists at the human level. Most frontline staff described the hotel's energy policies positively, and several connected energy conservations directly to their own financial interests. As one participant noted, savings in operating costs ultimately flow into service charge distributions, which supplement staff wages. This framing casting sustainability as something that benefits the employee, not just the planet proved to be one of the more effective tools in the hotel's informal communication arsenal.

Yet several supervisors acknowledged that full compliance remained elusive. One senior participant estimated that only sixty to seventy percent of the roughly two hundred employees actively observed energy-saving protocols at all times. The remaining third tended not to be actively resistant so much as simply inattentive: lights left on in unoccupied areas, air conditioning running in empty offices, computers and monitors left on standby overnight. The root cause, according to multiple participants, was not ill will but insufficient internalization, a feeling that energy policies were 'someone else's job' rather than a shared responsibility.

The training picture added texture to this finding. Most participants described receiving sustainability orientation once, during their induction, with no structured follow-up. One participant rated the current energy-saving programmed at seven out of ten, noting that sensor malfunctions and slow maintenance response sometimes neutralized the benefit of installed technology. Another flagged that the automatic cut-off of office

air conditioning at 8:00 PM intended to reduce energy consumption during low-traffic evening hours created genuine discomfort for staff in late-shift roles, such as those in outlet management, who sometimes work until 1:00 or 2:00 AM. This specific friction point was the most concrete example of a policy designed for environmental benefit inadvertently creating a welfare cost for employees.

Housekeeping staff (particularly P8) offered a more positive perspective, noting that their department's Standard Operating Procedures (SOPs) already embed energy discipline: every room departure triggers a checklist that includes switching off all lighting, air conditioning, and non-essential appliances. For housekeeping, energy conservation is not an additional burden but an integral part of doing the job well. This contrast between departments where sustainability is written into the workflow and those where it relies on individual vigilance is an important structural finding that has implications for how training and incentive programmes should be targeted.

4.2.4 Guest-Facing Energy Measures

For guests, the most visible energy-related intervention is the key card energy management system installed in all guestrooms. When a guest removes their card from the in-room slot, all non-essential power lighting, air conditioning, and wall sockets not connected to the guest's own devices are cut automatically. The system is broadly accepted by guests, though a small number of comments have historically related to motion-sensor lights in corridors extinguishing too quickly. Engineering staff have progressively adjusted the sensor delay timers in response to this feedback, demonstrating a feedback loop between operational policy and guest experience.

The linen and towel reuse program, signaled to guests via in-room tent cards, operates on a similar opt-in philosophy: guests who choose not to have their towels changed daily do so voluntarily, and the program has generated consistent water and energy savings in the laundry operation without generating complaints. The hotel has also replaced single-use plastic water bottles in guestrooms with glass alternatives, and biodegradable laundry bags have replaced standard plastic versions. In some room categories, living potted plants have replaced fresh-cut flowers, reduced floral waste while maintaining a natural aesthetic. In-room recycling bins sit alongside general waste receptacles, giving guests the infrastructure to participate in waste separation should they choose to do so.

Guest P12 confirmed that the water pressure and temperature in their room remained entirely satisfactory, and noted appreciation for the hotel's use of paper-based packaging and recyclable cup lids in the food and beverage offer. The same guest observed mild dissatisfaction with paper straws, which they felt affected the sensory experience of drinking certain beverages, a small but instructive reminder that sustainability interventions, however well intentioned, can introduce micro-frictions in guest experience that require ongoing monitoring and refinement. Overall, however, the guest data point confirmed what emerged across the staff interviews: the hotel has successfully implemented a comprehensive suite of environmental

measures without meaningfully degrading the quality of the guest experience, demonstrating that operational sustainability and service excellence are not inherently in conflict.

4.3 Theme 2: Water Conservation and Recycling

4.3.1 A Closed-Loop Approach to Water Management

Water conservation at this goes well beyond the conventional hotel practice of encouraging guests to reuse their towels. The hotel operates a closed-loop water management system that treats wastewater to a standard suitable for reuse and returns it to the property in two primary streams. The first stream is used for landscaping, irrigating trees and planted areas in locations that are not directly visible to guests, reducing dependence on mains water for groundskeeping. The second stream feeds the cooling towers that serve the main chiller plant, replacing a portion of the potable water that would otherwise be consumed by the evaporative cooling process. Together, these two recycled streams amount to approximately forty cubic meters per day, a not insignificant volume in a country where water tariffs and scarcity concerns are both growing.

The hotel's plumbing infrastructure reinforces conservation at the point of use. Sensor-activated taps are installed in all staff-facing washroom areas, eliminating the possibility of taps being left running inadvertently. Guestroom taps and showerheads are fitted with aerators and flow restrictors devices that introduce air into the water stream, maintaining the sensation of strong pressure while reducing actual flow rates. Dual-flush toilets throughout the property allow guests to select a reduced flush for liquid waste, cutting per-flush water consumption. Water quality is monitored rigorously: a third-party contractor (referred to in interviews as Rio-Genera) performs bacteriological and chemical testing every three months, covering potable water, hot water, pool water, and incoming and outgoing wastewater streams. Legionella control is a particular focus, given the known risks in large building water systems.

Engineers read every water sub-meter daily, logging consumption figures and cross-referencing against expected baselines to detect leaks or unusual draw-offs early. Monthly leak inspections supplement this daily monitoring routine. The BMS integrates water and electrical data in a single dashboard, providing facility managers with a real-time view of the building's resource consumption.

4.3.2 Staff Perspectives on Water Conservation

Among all the sustainability themes explored in the interviews, water conservation generated the most uniformly positive responses. No participant described water-saving measures as burdensome, and several articulated a clear understanding of the financial logic: less water consumed translates directly into lower utility bills, which contributes to the hotel's operating margin and, indirectly, to staff wages and service charges. This direct line between personal financial wellbeing and environmental behavior was one of the most compelling motivational framings to emerge from the data.

Housekeeping staff (P8) noted that their cleaning SOPs are designed with water efficiency in mind. Bathroom cleaning follows a six-step protocol chemical application, dwell time, scrubbing, rinsing, drying that maximizes the effectiveness of each water application and minimizes the need for repeat rinsing. Glassware from multiple staff members is consolidated before being run through the dishwasher, rather than being washed individually, again reducing water consumption per unit. Kitchen staff (P7) described a practice of reusing water used to soak vegetables as a pre-rinse for cooking vessels, before the vessels are washed properly, a small but habitual form of water economy that speaks to an embedded culture of resource awareness in that department.

Two participants offered innovative ideas for extending the hotel's water recycling ambitions further. P5 suggested capturing rainwater from the hotel's roof the property has a substantial flat roof area and routing it through a simple filtration system for use in irrigation. P5 also drew attention to a less-considered source of liquid waste: the large volumes of leftover beverages dilute coffee, juice, and water discarded at the end of coffee-break events. Separating this from food scraps would, they argued, allow it to be processed or reused rather than simply contributing to the weight of waste collected. These ideas had not yet been formally proposed through the hotel's sustainability committee, but their spontaneous emergence in the interviews suggests a workforce that is actively thinking about sustainability problems even beyond their job descriptions.

4.4 Theme 3: Carbon Footprint Measurement and Awareness

4.4.1 Measurement at the Management Level

The hotel's approach to carbon footprint measurement is anchored in the MESH platform, which converts energy consumption data electricity drawn from the grid, gas consumed in kitchens and laundry, diesel burned in backup generators into carbon dioxide equivalent (CO_2) figures using internationally recognized conversion factors. The resulting carbon intensity metric expressed in kilograms of CO_2 per square meter is tracked monthly and benchmarked against prior-year figures. At the time of the research, the hotel's carbon intensity was showing a modest upward trend of approximately three to four per cent year-on-year, a figure that management acknowledged but had not yet reversed.

The hotel supplements its own measurement with a partnership with South Pole, a global carbon management firm, through which it purchases carbon credits to offset emissions that it cannot yet eliminate through operational changes. These credits fund reforestation projects and other carbon-reduction activities elsewhere. For meetings and events, the hotel uses Marriott's proprietary Meeting Value Report (MVR) tool to calculate event-specific carbon figures and provide corporate clients with verifiable sustainability data, an increasingly important capability as business clients embed sustainability criteria into their venue selection processes.

Supply chain carbon is also within the hotel's scope of consideration, though at an earlier stage of development. The procurement team screens suppliers, particularly food suppliers covering eggs, pork, and seafood against sustainability certification standards that include carbon performance indicators. This approach

aligns with the hotel's Green Leaf certification process, which requires evidence of responsible sourcing alongside operational environmental performance.

4.4.2 The Carbon Literacy Gap Among Frontline Staff

If the management-level picture of carbon measurement is coherent and evolving, the frontline picture is starkly different. Of the eleven staff participants, only one a participant in a marketing role (P5) demonstrated a meaningful understanding of the concept of carbon footprint, drawing on knowledge acquired through family connections and self-directed reading. Every other frontline staff member from housekeeping to kitchen, from front office to stewarding either had never encountered the term or associated it only vaguely with ideas about pollution and green space.

This finding is significant not merely as a knowledge deficit but as a structural barrier to behavior change. Carbon reduction targets require choices at the operational level whether to consolidate deliveries, how to manage kitchen equipment standby, whether to challenge a supplier's certification that are made by people who currently have no conceptual framework for understanding why those choices matter. One engineering participant (P2) explicitly noted that even within the technical team, the staff who enter data into the MESH system often do not understand the downstream calculations that their inputs generate.

Several participants, when the concept of carbon footprint was explained to them during the interview, responded with genuine curiosity and a sense that the knowledge was immediately useful. One participant reflected that if they had understood how food waste of different types generates different volumes of methane, they would have approached the separation of organic waste differently. This suggests that the appetite for carbon literacy exists; what is missing is the delivery mechanism.

The most commonly cited channels through which staff currently receive sustainability information on group messages and notice board postings are appropriate for reminders and brief updates but are poorly suited to building conceptual understanding of complex topics like carbon accounting. Multiple participants called for face-to-face training sessions with subject matter experts, delivered at department level and repeated at intervals of three to six months rather than confined to induction.

4.5 Theme 4: Food Waste Reduction and Community Donation

4.5.1 The Two-Stream Food Waste System

The hotel manages its food waste through two distinct operational streams, each with its own processes, partners, and metrics. The first stream handles surplus prepared food meals that have been cooked but not served, including buffet items at the end of service and event catering that was prepared in excess of demand. This food is donated through two channels: a partnership with the SOS Foundation (Scholars of Sustenance), a Bangkok-based food rescue organization with established logistics for collecting and redistributing prepared food to vulnerable communities; and direct collection by nearby community groups who arrive at the hotel to receive donations when the distance from the SOS Foundation's distribution network makes a timely pick-up impractical. In both cases, the food donated is composed exclusively of items that have not been touched by

guests; it comes directly from the kitchen or the serving line, not from plates. At time of collection, it is refrigerated in a dedicated chilled storage space near the service lift lobby.

The second stream handles food scraps, what remains after guests have eaten and what is generated during preparation. Plate waste and preparation offcuts are separated from other waste by kitchen and stewarding staff, weighed daily, recorded in kilograms in the MESH system, and sold at month-end to a buyer who processes the material as animal feed, primarily for fish, pigs, and chickens. The stewarding team also records liquid food waste including soups and sauces in these daily figures, ensuring that the hotel's waste measurement is comprehensive rather than confined to solid matter.

The hotel's "clean plate" campaign running on Wednesdays and Fridays in the staff canteen represents an attempt to address food waste at the demand side within the hotel itself. On these days, the canteen menu is designed to offer dishes that are easy to finish entirely: simple preparations without bones, gristle, or excessive liquid. Staff are encouraged to take only what they can eat and to return for seconds rather than over-serving themselves. Canteen waste from these days is tracked and benchmarked against non-campaign days.

4.5.2 The Emotional Dimension: Pride, Concern, and Dissent

Food donation generated a more complex and emotionally layered set of responses than any other sustainability theme in the study. The predominant feeling expressed across departments and seniority levels was pride. For many participants, the knowledge that food prepared in their hotel's kitchen was feeding families who might otherwise go without was a source of genuine satisfaction, one that they connected to a broader sense of doing meaningful work rather than simply earning a wage. Several participants used the word "proud" unprompted, and one housekeeping participant (P8) described it as one of the aspects of working for the hotel that they would mention to friends and family.

This pride, however, coexisted with a set of legitimate concerns that a few participants articulated with care and precision. Two staff members (P5 and P11) raised questions about food safety during the post-kitchen, pre-consumption window. Their concern was not that the hotel was donating food that was unsafe at the point of departure, but that they could not be certain the food remained safe throughout the logistics chain particularly in hot weather, where the window between preparation and consumption can be narrow. One participant went further, questioning whether cooked meals were the most appropriate form of donation at all, arguing that distributing raw ingredients would give recipients some of whom might have dietary restrictions related to diabetes, hypertension, or allergies more control over what they ate.

These concerns represent a thoughtful and ethically serious engagement with the limits of the donation model, and they deserve formal consideration. The hotel might benefit from documenting the cold chain handling procedure as a formal SOP, training the relevant staff to follow it, and periodically reviewing it with the SOS Foundation to ensure alignment with food safety best practice. This would not only reduce the residual risk of a food safety incident but would give concerned staff the reassurance that the program they are proud of is also rigorously managed.

The chef participant (P7) offered a complementary operational observation: the volume of food available for donation has declined over time as the kitchen has become more disciplined about production planning. Chefs now calibrate output more carefully against occupancy rates, producing closer to what will actually be consumed rather than filling the buffet line to capacity regardless of the number of guests. This upstream reduction in surplus production is, in sustainability terms, a better outcome than donating the food that was never over-prepared generates no waste at all. That this improvement is visible in the donation volumes is indirect evidence that the kitchen's planning practices are working.

One further idea emerged from the data: several participants suggested that food surplus could be offered to staff before going to external donation, a practice that would reduce both waste and the food costs that some employees, particularly lower-paid frontline staff, face. This idea has merit both practically and symbolically, as it would extend the hotel's care for its community to include the internal community of its own workforce.

4.6 Theme 5: Employee Motivation, Engagement, and Sustainability Culture

4.6.1 What Motivates Staff to Engage

Across the interviews, three distinct motivational orientations towards sustainability emerged. The first and most commonly cited was intrinsic: a genuine care for the natural environment, sometimes rooted in upbringing, sometimes in broader awareness of climate change. Several participants spoke about sustainability in terms that extended well beyond their professional role. They described changing their own personal habits at home in response to what they had learned at work, and expressed a sense that the hotel's values aligned with their own. This alignment of personal and organizational values is a significant motivational resource that the hotel is not yet fully capitalizing on through its communication and training strategies.

The second orientation was social: pride in being part of an organization that acts responsibly, particularly through the food donation program and community events such as World Food Day cooking activities and canal clean-ups. This social dimension of sustainability motivates the desire to be seen to be doing good, or to feel part of something larger than a commercial transaction was most visible in the food and beverage and housekeeping departments, where the community-facing nature of the hotel's CSR activities was most tangible.

The third orientation was extrinsic: the understanding that sustainability contributes to cost savings, which in turn support service charge distributions and the hotel's ability to invest in staff welfare, training, and amenity. This pragmatic framing was more common among participants with longer tenure and a clearer view of the hotel's P&L dynamics. It is worth noting that this framing sustainability as financial self-interest is not cynical but is actually highly effective as a motivational bridge for employees who may not yet have strong intrinsic environmental values.

4.6.2 The Training and Communication Gap

The most consistent finding across all five themes was the insufficiency of the current training and communication framework. The pattern was strikingly uniform: most staff received sustainability information once, at induction, via an online module or a brief departmental briefing. Thereafter, sustainability communication was delivered primarily through group messages useful for reminders but insufficient for building understanding and periodic notice board updates. Physical training by subject matter experts from Marriott International's corporate sustainability team had not been delivered at the property level, despite being identified as highly desirable by several participants.

Several participants proposed specific improvements. One suggested quarterly face-to-face training sessions at department level, arguing that the same regularity applied to customer service training should be applied to sustainability. Another proposed morning briefing slot is already a standard feature of the hotel's daily management rhythm as a vehicle for brief, targeted sustainability messages that would keep the topic alive between formal training events. A third suggested using visible data showing staff exactly how much energy or water their department had saved in the past month, in terms they could relate to as a way of making abstract environmental metrics personally meaningful.

The observation that waste separation continues to be imperfect with an estimated thirty to forty per cent of staff not consistently sorting waste correctly is a direct consequence of this training gap. Waste separation is a behavior that requires both knowledge (which items go where) and habit (the automatic motor response of reaching for the correct bin). Knowledge can be conveyed in a training session; habit requires repeated practice and prompt feedback. Without a structured reinforcement program, the initial training fades and the old habits reassert themselves.

4.6.3 Corporate Social Responsibility Activities and Their Role in Sustainability Culture

Beyond the hotel's core operational sustainability practices, a program of community-facing CSR activities plays a meaningful role in shaping the organizational culture around environmental and social responsibility. Participants across departments mentioned a range of recurring activities: canal-cleaning days in the hotel's neighborhood, World Food Day cooking and distribution events in which hotel chefs prepare meals for vulnerable community members, Earth Hour participation, and a partnership with a local bakery partner through which the hotel provides kitchen facilities and staff time to bake bread that is then jointly donated to community groups. Used cooking oil from the hotel's kitchens is collected and used to make candles during earth hour, an example of upcycling that several staff mentioned with evident pride.

These activities perform a function that goes beyond their direct environmental impact. They are occasions on which staff members from different departments work together towards a shared, visible, humane goal. The canal-cleaning participant stands alongside the housekeeping supervisor and the junior chef, all of them doing something that has nothing to do with their job title and everything to do with the values the hotel

says it holds. This kind of shared experience is a powerful mechanism for building organizational culture more powerful, in some respects, than any number of intranet modules or policy documents.

The findings suggest that the hotel would benefit from making these activities more visible to the full workforce, not merely to those who participate directly. Regular communication through the same groups message and notice boards that carry energy-saving reminders that celebrates CSR participation, shares photographs, and quantifies impact (meals served, liters of cooking oil upcycled, kilograms of bread baked) would extend the cultural reach of these events beyond their direct participants. This kind of storytelling is not peripheral to the sustainability program it is, for many employees, its most human and motivating face.

4.6.4 Incentive Structures and Their Limitations

The hotel's current incentive structure for sustainability-related behaviors is modest. Token rewards and supermarket gift vouchers distributed at Town Hall events are funded partly by revenue from recycled materials. The hotel sells collected recyclables plastic bottles, aluminum cans and cardboard generating income in the high hundreds of thousands of baht annually. HP ink cartridges returned to the manufacturer through a take-back scheme also generate credit that can be redeemed for goods distributed to staff. While these gestures are appreciated, multiple participants noted that they are not sufficient to shift behavior among the thirty to forty per cent who are currently disengaged.

A more ambitious incentive scheme was in planning at the time of the interviews: a gamified points system under which staff would scan a QR code when correctly disposing of recyclable waste, accumulating points that could be redeemed for prizes. The scheme drew explicit inspiration from consumer-facing recycling apps available in the broader market. Its introduction was anticipated within the current financial year, though participants were cautious about its success depending on whether the system would be seen as genuinely fair and transparent, or as surveillance.

One supervisor (P10) proposed a more structurally significant incentive: linking demonstrated sustainability performance measured at department level through waste separation accuracy, energy consumption per occupied room, and similar metrics directly to a portion of departmental bonus or service charge calculation. This idea has precedent in the broader hospitality industry but would require careful design to avoid perverse incentives, such as departments gaming the metrics by under-reporting waste rather than genuinely reducing it. If implemented with integrity, however, it could be transformative: making sustainability not an add-on to the job but a formal component of how good performance is defined and rewarded.

CHAPTER 5: DISCUSSION AND CONCLUSION

5.1 Introduction

This chapter steps back from the detailed findings of Chapter Four to consider what they mean in aggregate: what they reveal about the hotel's sustainability journey, how they speak to the theoretical frameworks established in Chapter Two, and what they imply for the practical choices facing hotel operators and their leadership teams. The chapter is structured in two parts. The first part, the discussion, examines the key findings in light of existing theory and previous research, drawing out points of alignment, tension, and surprise. The second part, the conclusion, synthesises the study's contributions, acknowledges its limitations, and offers recommendations for practice and future research.

5.2 Discussion

5.2.1 When Technology Leads and Culture Lags: Understanding the Energy–Behaviour Gap

The energy management findings from Marriott Airport Hotel illustrate a pattern that has been documented across the sustainability literature: the technological capacity to reduce environmental impact can race ahead of the organisational culture needed to sustain those reductions over time. The hotel's BMS, TOU metering strategy, LED lighting with dimmer control, and MESH-based monitoring system represent a genuinely sophisticated infrastructure one that operates largely automatically and delivers measurable results. Yet a compliance gap of thirty to forty per cent among frontline staff persists, driven not by resistance but by insufficient training and an absence of feedback mechanisms that would make staff aware of their own contribution to the hotel's energy performance.

This finding resonates strongly with (Lewin,1947) change management model, which identifies unfreezing existing behaviours, introducing new ones, and refreezing them as the embedded norm as the three essential stages of lasting organisational change. The hotel has, in effect, completed the first stage, the technology is installed, the policies are written, and senior leadership is committed. It has partially completed the second stage training, communication channels exist, and many staff are engaged. But it has not yet completed the third stage: sustainability behaviours have not become automatic, normative, or structurally embedded in most departments in the way that they have in housekeeping, where SOPs encode the behaviour directly into the job description.

The systems theory framework from Chapter Two is also illuminating here. Systems theory (von Bertalanffy, 1968) holds that changes in one subsystem of an organisation create ripple effects across others. The late-evening air conditioning cut-off policy is a clear example: designed within the energy management subsystem to reduce off-peak consumption, it creates an unintended negative effect in the human resources subsystem by reducing the comfort of staff in late-shift roles. This cross-subsystem friction is a reminder that sustainability policies cannot be designed in isolation; they must be tested against the full system of the organisation's operations, including the working conditions of the people who implement them.

The solution is not to abandon ambitious energy targets but to design them with greater system awareness. A simple and low-cost adjustment allowing verified late-shift staff to override the automatic cut-off for their specific area would resolve the most acute complaint without materially affecting the hotel's energy consumption, since the override would apply to a small area for a limited period. More broadly, the hotel might benefit from establishing a cross-departmental sustainability working group that reviews proposed policy changes for unintended consequences before implementation, drawing on the knowledge of staff in different roles who can identify friction points that management might not anticipate.

5.2.2 Carbon Literacy as a Strategic Imperative

The near-universal absence of carbon footprint awareness among frontline staff is the most strategically significant finding of this study, and it requires discussion proportional to its importance. It is easy to frame this finding as simply a training problem, one that could be addressed by adding a module to the induction programme or sending a more detailed group chat message. But that framing misses the deeper issue.

Carbon literacy is not merely a piece of information to be transmitted. It is a conceptual framework that, once internalised, changes how a person perceives the consequences of their own actions. A kitchen porter who understands that wet food waste generates significantly more methane when landfilled than when composted or processed as animal feed will separate their waste differently, not because they have been told to but because the understanding has made the distinction meaningful to them. A purchasing manager who understands that supply chain carbon (Scope 3 emissions) can dwarf the hotel's own direct emissions (Scopes 1 and 2) will ask different questions of their suppliers. A housekeeping team leader who understands that the energy embedded in a hotel towel, the water, the heat, the detergent, the transport means that every unnecessary laundering cycle has a carbon cost will enforce the linen reuse programme differently.

This connects directly to the Stakeholder Theory framework (Freeman, 1984) that underpins the study. If employees are to be genuine internal stakeholders in the hotel's sustainability project rather than passive recipients of policies designed by others they need the conceptual tools to participate meaningfully in that project. At present, the knowledge asymmetry between management and frontline staff is so large that meaningful participation is effectively precluded. Bridging this gap is not only a training priority but an ethical commitment to treating employees as intelligent agents capable of contributing to, rather than merely implementing, the hotel's environmental strategy.

The approach to carbon communication also needs to change. Carbon dioxide equivalent is an abstract unit that most people find difficult to relate to lived experience. The sustainability literature (Whitmarsh et al., 2011) consistently shows that translating carbon into familiar equivalents trees planted, car journeys avoided, meals fed dramatically increases public comprehension and behavioural response. The hotel's MESH system already generates carbon data in kilogram and tonne equivalents; the next step is to translate those figures into narratives that connect with the everyday experience of a Bangkok hotel worker. A monthly sustainability

notice board display that shows "this month, our team's actions saved the equivalent of X car journeys" is a small investment with potentially large motivational returns.

5.2.3 Food Donation as a Cultural Asset and a Risk Management Responsibility

The food donation programme is, without question, the hotel's most emotionally resonant sustainability initiative. The pride it generates among staff is genuine, consistent, and cross-departmental; it appears in the responses of housekeeping staff who have no direct role in food production, marketing staff who are not involved in community logistics, and engineers who rarely interact with the kitchen. This breadth of emotional ownership suggests that the programme has succeeded in becoming something larger than a logistics arrangement: it has become part of the hotel's identity, a story that staff tell about themselves and their workplace.

This cultural asset is significant because it does something that energy-saving targets and waste separation protocols cannot easily do: it provides a human face for sustainability. Reducing energy intensity per occupied room by two per cent is important, but it does not give a member of staff a story to tell at a family dinner. Knowing that the food prepared in their hotel's kitchen fed a vulnerable family in the community does. The Triple Bottom Line framework (Elkington, 1997) would categorise this as a social dimension of sustainability performance and the finding here is that it is the social dimension that generates the most powerful motivational response among employees. Hotel operators who underinvest in the social face of sustainability risk building a programme that is technically competent but emotionally inert.

The food safety concerns raised by two participants deserve careful attention precisely because they emerge from staff who are otherwise proud of the programme. These are not critics looking for reasons to dismiss the donation initiative; they are supporters asking whether it could be made more robust. Their concerns align with established food safety principles: the risk window between preparation and consumption is real, particularly in a tropical climate where bacterial growth accelerates rapidly above 4 degrees Celsius. A formal cold chain SOP — specifying maximum time-to-collection, required storage temperatures, approved container types, and a handover checklist would address these concerns without adding significant operational burden.

The suggestion that raw or lightly processed ingredients might be a more appropriate donation in some circumstances also merits consideration, particularly for recipients with dietary restrictions. A hybrid model donating prepared food through the SOS Foundation for immediate distribution, while making a portion of near-expiry ingredients available to community partners with cooking capacity would preserve the logistical simplicity of the current model while extending its reach and appropriateness. This is an area where the hotel might benefit from a structured conversation with the SOS Foundation and community partners, informed by the concerns that staff have themselves raised.

5.2.4 Incentives, Fairness, and the Architecture of Behavioural Change

The question of how to sustain and deepen employee engagement with sustainability is ultimately a question about the architecture of behavioural change. The literature on pro-environmental behaviour in organisations (Ones and Dilchert, 2012; Robertson and Barling, 2013) consistently identifies three conditions for durable change: the behaviour must be made easy to perform, it must be socially reinforced, and it must be visibly rewarded. The hotel currently performs relatively well on the first condition: the infrastructure for energy saving, water recycling, and waste separation has been thoughtfully designed. It performs moderately well on the second condition: the group chat, notice board campaigns, and the food donation culture all provide social reinforcement. It performs less well on the third condition: the current incentive structure, based on token vouchers and occasional gamification, falls short of what is needed to shift the disengaged third of the workforce.

The gamified recycling points system in development represents a genuine step forward, and its design will be critical. Behavioural economics research (Thaler and Sunstein, 2008) suggests that point accumulation systems are most effective when the connection between the behaviour and the reward is immediate, visible, and perceived as fair. If staff scan a QR code when disposing of recyclables correctly and see their points total increase in real time, the feedback loop is tight and motivating. If the system is perceived as arbitrary if scanning is inconsistently applied, or if points can be gamed by scanning without actually separating waste correctly it will lose credibility quickly.

The more structurally significant proposal linking sustainability performance to service charge calculation or departmental bonus is worth taking seriously as a medium-term goal, even if it is too complex to implement immediately. The key design challenge is ensuring that the metrics used are transparent, verifiable, and within staff control. Metrics like waste separation accuracy (assessed through periodic bin audits) and energy consumption per shift (tracked through MESH) meet these criteria. Metrics based on total energy consumption regardless of occupancy do not, since demand is driven primarily by guest behaviour and cannot be fully controlled by staff. Careful metric design could make this incentive structure both motivating and fair.

5.2.5 The Business Case: Sustainability as Competitive Advantage

Beyond its environmental and social dimensions, the hotel's sustainability programme carries a growing strategic significance that several participants — particularly those in management and marketing roles — articulated clearly. Corporate travel buyers, meetings and events planners, and large organisations booking accommodation for their staff increasingly incorporate sustainability criteria into their venue selection process. A hotel that can provide verified carbon data for a conference, demonstrate compliance with Marriott's Sustainability Scorecard, and point to concrete community partnerships is meaningfully differentiated from one that cannot.

This commercial dimension connects to the stakeholder theory framework in an important way: the external stakeholders who are most immediately affected by the hotel's sustainability performance are not the natural environment (which cannot speak for itself in procurement negotiations) but the corporate clients who are themselves under pressure from their own stakeholders investors, regulators, employees to demonstrate responsible supply chain choices. The hotel's partnership with South Pole for carbon offsetting, its MESH-based reporting, and its Green Leaf certification are all positioning tools in this competitive space, not merely environmental commitments.

The proposed solar photovoltaic installation, raised by one participant (P10) as a suggestion that had been received positively by senior management, illustrates how environmental and commercial logic can converge. With a roof area of 400–500 square metres, the engineering team estimated that a solar installation could reduce grid electricity consumption by twenty to thirty per cent, with a capital cost of approximately 1 to 1.5 million baht and a payback period of five to seven years. This represents a strong return on investment by any measure, and the carbon reduction would also meaningfully improve the hotel's position against sustainability targets. The fact that such a proposal is already on the management agenda suggests that the hotel's leadership team is thinking about sustainability in genuinely integrated terms as something that serves environmental goals, financial goals, and competitive positioning simultaneously.

5.3 Conclusion

5.3.1 Summary of Key Findings

This study set out to explore how a five-star hotel in Bangkok translates sustainability commitments into operational reality, and how the employees who carry those commitments into daily practice experience and perceive them. Conducted through in-depth semi-structured interviews with eleven staff members and one guest at Marriott Airport Hotel, the research has surfaced a picture of an organisation that has built a genuinely solid sustainability infrastructure in energy management, water recycling, food waste reduction, and community partnership while facing persistent challenges in making that infrastructure come alive at the human level.

Five key findings stand out. First, the hotel's energy management technology is sophisticated and effective, but a compliance gap of thirty to forty per cent among frontline staff persists because sustainability behaviours have not been fully embedded into departmental workflows or supported by adequate ongoing training. Second, water conservation measures are broadly accepted, operationally effective, and genuinely valued by staff who understand the direct financial benefits they generate. Third, carbon footprint awareness is almost entirely absent among frontline staff, representing a significant structural barrier to the collective ownership of carbon reduction targets. Fourth, the food donation programme is the hotel's most emotionally resonant sustainability initiative, generating genuine pride across departments, but food safety management in the post-kitchen logistics chain requires formalization. Fifth, the current incentive and training framework is insufficient

to move the disengaged minority towards active participation, and the hotel's planned gamification initiative, while promising, will need careful design to succeed.

5.3.2 Theoretical Contributions

The study makes several contributions to the theoretical frameworks that underpinned its design. In relation to Stakeholder Theory (Freeman, 1984), the research demonstrates that employees function most effectively as internal sustainability stakeholders when they have the conceptual tools, particularly carbon literacy to participate meaningfully in the hotel's environmental project, rather than simply implementing policies designed by others. In relation to Systems Theory (von Bertalanffy, 1968), the finding that the late-evening air conditioning cut-off creates unintended welfare costs for late-shift staff illustrates how sustainability policies designed within one organisational subsystem can produce negative consequences in another, arguing for cross-system policy review processes. In relation to the Triple Bottom Line (Elkington, 1997), the disproportionate motivational power of the food donation program's social dimension suggests that, in labor-intensive service sectors, the "People" pillar of the TBL may be a more effective lever for generating staff engagement than the "Planet" pillar, even when the goal is environmental improvement.

5.3.3 Practical Recommendations

On the basis of the findings and discussion, the following recommendations are offered to the hotel's management team and, by extension, to hotel operators facing similar challenges.

Formalize sustainability training across all departments and seniority levels. Induction-only training is insufficient for building either knowledge or habit. A quarterly face-to-face program, delivered at department level by trained facilitators, should cover energy, water, carbon, and waste themes at a level of depth appropriate to the role. Carbon literacy content should be translated into accessible language using local equivalents and familiar comparisons rather than relying on technical metrics.

Translate energy and water data into narratives that staff can own. The MESH system generates rich data that currently reaches most staff only as abstract institutional targets. Converting monthly performance into relatable equivalents trees planted, meals funded, service charge increments attributable to savings and communicating these through morning briefings and visual displays would close the feedback loop between individual behaviour and collective outcome.

Formalise the food donation cold chain as an SOP. The pride that staff invest in the food donation programme is a cultural asset worth protecting. Formalising the post-kitchen handling procedure storage temperatures, time-to-collection limits, container standards, handover checklists would reduce food safety risk, give concerned staff reassurance, and demonstrate that the hotel manages community commitments with the same rigour it applies to guest-facing operations.

Review the late-evening air conditioning cut-off policy. The current policy creates genuine discomfort for late-shift staff and has been identified as a source of resentment. A low-cost adjustment such as department-

specific overrides for verified late-shift roles would resolve the complaint without materially affecting energy consumption, and would signal to staff that their working conditions are considered alongside environmental targets.

Accelerate and carefully design the gamified recycling incentive scheme. The planned QR-code points system has significant potential, but its success will depend on perceived fairness and the tightness of the feedback loop between behaviour and reward. Piloting the scheme in one department before rollout, collecting staff feedback on its design, and publishing monthly leaderboards that celebrate departmental rather than individual performance would improve its chances of sustained impact.

Invest in building a supplier sustainability network. Several participants noted that carbon footprint data from the supply chain, particularly food and beverage suppliers, is becoming an increasingly important element of the hotel's Green Leaf certification and its pitch to corporate clients. Building a structured supplier engagement programme sharing sustainability expectations clearly, offering guidance to smaller suppliers on how to measure and report their environmental performance, and rewarding suppliers who improve their credentials with longer-term contracts would extend the hotel's sustainability influence well beyond its own walls. This is both the right thing to do and, as supply chain carbon disclosure requirements tighten across the region, a commercially prudent investment.

Explore the solar photovoltaic installation proposal. The business case for rooftop solar estimated payback of five to seven years with a twenty to thirty per cent reduction in grid electricity costs is strong, and the environmental benefit would meaningfully improve the hotel's carbon performance. Moving this from a staff suggestion to a formal feasibility study would signal leadership commitment to innovation and long-term investment in sustainability infrastructure.

5.3.4 Limitations and Future Research

This study is subject to several limitations that should be acknowledged. As a single-site case study, its findings are specific to Marriott Airport Hotel and cannot be directly generalised to the hotel industry in Thailand or internationally. The data were collected at a single point in time, and the hotel's sustainability programme is actively evolving; findings may not reflect the situation as it stands at the time of reading. The interview sample, while diverse in departmental representation, was necessarily limited in size and may not have captured all perspectives within the workforce. Participant responses may also have been influenced by social desirability — a tendency to present oneself as more sustainability-conscious than one's actual behaviour would reflect, particularly in an institutional context where sustainability is an explicit management priority.

Future research might productively extend this work in several directions. A multi-site comparative study across hotels of different chain affiliations, star ratings, and location types would allow the findings to be tested for generalisability and would identify whether the compliance and literacy gaps observed here are specific to this property or characteristic of the sector more broadly. A longitudinal study that tracks the same hotel over a period of three to five years would be particularly valuable in assessing whether training and incentive interventions produce durable changes in staff behaviour. Quantitative measurement of carbon

literacy using validated instruments adapted to the Thai hospitality context would allow the scale of the gap to be measured precisely and monitored over time. Finally, research that centres the perspectives of external stakeholders guests, community partners, food donation recipients, and suppliers would complement the employee-focused methodology of this study and provide a fuller picture of the hotel's sustainability relationships.

5.3.5 Implications for the Wider Hospitality Sector

Although this research was conducted at a single property, the findings carry implications that extend beyond Marriott Airport Hotel to the hospitality sector more broadly and perhaps most directly to mid-to-large-scale hotels operating in rapidly developing urban markets across Southeast Asia, where environmental regulation is tightening, corporate client expectations are rising, and the workforce is large, multilingual, and often without prior exposure to formal sustainability education.

The sustainability literature has tended to focus on either the technological dimension of hotel environmental management, energy-efficient HVAC systems, water recycling infrastructure, waste processing technologies or on guest-facing communication strategies that position sustainability as a brand differentiator. What receives comparatively less attention is the middle layer: the workforce that operates the technology, interprets the policies, and carries the culture of sustainability into every guest interaction and every back-of-house routine. This study argues that this middle layer is, at present, the critical bottleneck in the hotel industry's sustainability journey.

The insight has a practical corollary for hotel general managers and sustainability directors: the return on investment from spending on staff sustainability education time, curriculum development, facilitation is likely to exceed the return from further marginal improvements to physical infrastructure in properties that have already achieved a reasonable level of technological sophistication. Put differently, once the BMS is installed and the MESH system is operational, the next dollar of sustainability investment is probably better directed at the human system than the technical one.

This does not mean that infrastructure investment should cease. The solar photovoltaic proposal, the expansion of motion-sensor coverage, the formalisation of water quality monitoring all remain important. But it does mean that organisations should resist the temptation to treat capital expenditure on technology as a substitute for the harder, slower work of building a culture in which every member of staff understands why their daily choices matter, and is given the feedback, the language, and the recognition to act on that understanding.

Thailand's greenhouse gas regulatory environment also deserves mention in this context. At the time of the research, national legislation on mandatory greenhouse gas reporting for commercial operators was in draft form, with implementation anticipated around 2030. When that legislation comes into force, hotels that have already built robust carbon measurement and reporting systems as this Marriott Airport Hotel has done through MESH and South Pole partnership will be in a significantly stronger position than those scrambling to construct

such systems under regulatory pressure. Building carbon literacy among staff now, well ahead of mandatory reporting requirements, would accelerate the hotel's ability to meet those requirements when they arrive and would give it a meaningful head start over competitors who have not yet begun this work.

5.3.6 Closing Reflection

The people at the centre of this research the engineer who monitors water meters every morning before guests are awake, the housekeeper who closes every curtain and switches off every light as a matter of professional habit, the chef whose kitchen sends less food to waste this month than it did last year, the steward who weighs food scraps to the kilogram and enters them into a system whose downstream calculations they do not yet understand are doing something remarkable. They are, in their daily working lives, enacting a version of the sustainable hotel that the industry is still learning to imagine.

What this research makes visible is both the achievement and the distance still to travel. The achievement is real: a hotel that recycles forty cubic metres of water daily, that donates surplus food to vulnerable communities through a structured partnership, that monitors its carbon intensity month by month, that invests in motion sensors and BMS automation and solar feasibility studies, and that has built enough of a sustainability culture that two thirds of its workforce engage with it genuinely. This is not a hotel paying lip service to environmental responsibility. It is a hotel doing serious work.

And yet the distance is also real. The thirty to forty per cent who do not yet fully participate. The frontline workers who have never heard the words "carbon footprint" explained in their own language. The food donation cold chain that lacks a formal SOP. The training that happened once, at induction, and has not been systematically reinforced since. The late-shift worker sitting in a warm office after 8:00 PM wondering whether the people who designed the energy policy ever thought about what their job looks like at 1:00 in the morning.

What those people need and what this research suggests is well within the hotel's reach is not more technology or more policy. It is more of a connection: between what they do each day and why it matters; between the numbers on the MESH dashboard and the difference those numbers make to a community, a climate, a child. The infrastructure is there. The will is there, expressed in pride at community donations, in ideas about rainwater harvesting volunteered in research interviews, in genuine concern for the safety of the families receiving food from the hotel's kitchen. The task now is to build the knowledge, the feedback, and the shared language that would allow that will to become, fully and durably, action. That is not a technical challenge. It is a human one. And it is, of all the challenges this research has identified, the one most fully within the hotel's power to meet.

REFERENCES

- (Ahmed et al., 2025)

  Ahmed, S. K., Mohammed, R. A., Nashwan, A. J., Ibrahim, R. H., Abdalla, A. Q., M. Ameen, B. M., & Khdhir, R. M. (2025). Using thematic analysis in qualitative research. *Journal of Medicine, Surgery, and Public Health*, *6*(100198), 100198. https://doi.org/10.1016/j.glmedi.2025.100198
- (Biswal, 2020)

  Biswal, D. (2020). Nudge: Improving decisions about health, wealth, and happinessRichard H.Thaler & Cass R.SunsteinLondon, UK: Penguin2009, ISBN: 978-0-141-04001-1. *Journal of Public Affairs*, *20*(3). https://doi.org/10.1002/pa.2075
- (Braun & Clarke, 2006)

  Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101.
- (Bryman, 2016)

  Bryman, A. (2016). *Social research methods*.
- (Creswell & Poth, 2018)

  Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches*. SAGE Publications.
- (Deng & Burnett, 2002)

  Deng, S.-M., & Burnett, J. (2002). Water use in hotels in Hong Kong. *International Journal of Hospitality Management*, *21*(1), 57–66. https://doi.org/10.1016/s0278-4319(01)00015-9
- (Edrisi et al., 2021)

  Edrisi, S. A., Rakshit, A., Dubey, P. K., Abhilash, P. C., Singh, S. K., Patra, A. K., & Pathak, H. (2021). Managing soil resources for human health and environmental sustainability. In *Soil Science: Fundamentals to Recent Advances* (pp. 3–11). Springer Singapore.
- (Hayden et al., 2012)

  Hayden, N. J., Roelke, D. L., Brooks, B. W., Grover, J. P., Neisch, M. T., Valenti, T. W., Jr, Prosser, K. N., Gable, G. M., Umphres, G. D., & Hewitt, N. C. (2012). Beyond hydraulic flushing: Deep water mixing takes the harm out of a haptophyte algal bloom. *Harmful Algae*, *20*, 42–57. https://doi.org/10.1016/j.hal.2012.07.006
- (Himeur et al., 2023)

  Himeur, Y., Elnour, M., Fadli, F., Meskin, N., Petri, I., Rezgui, Y., Bensaali, F., & Amira, A. (2023). AI-big data analytics for building automation and management systems: a survey, actual challenges and future perspectives. *Artificial Intelligence Review*, *56*(6), 4929–5021. https://doi.org/10.1007/s10462-022-10286-2

- (Lincoln et al., 1985)

  Lincoln, Y. S., Guba, E. G., & Pilotta, J. J. (1985). Naturalistic inquiry. *International Journal of Intercultural Relations*, *9*(4), 438–439. https://doi.org/10.1016/0147-1767(85)90062-8

- (*Maxwell, J.a. (2013) Qualitative Research Design An Interactive Approach. Sage, Thousand Oaks. - references - scientific research publishing*, n.d.)

  Maxwell, J.a. (2013) Qualitative Research Design An Interactive Approach. Sage, Thousand Oaks. - references - scientific research publishing. (n.d.). Scirp.org. Retrieved May 5, 2026, from https://www.scirp.org/reference/referencespapers?referenceid=2486954

- (Mensah, 2006)

  Mensah, I. (2006). Environmental management practices among hotels in the greater Accra region. *International Journal of Hospitality Management*, *25*(3), 414–431. https://doi.org/10.1016/j.ijhm.2005.02.003

- (Muchele et al., 2025)

  Muchele, E. M., Osodo, B., Omosa, I., & Kombe, E. Y. (2025). Characterization of food wastes from the hotel industry as a potential feedstock for energy production. *Energy Nexus*, *17*(100364), 100364. https://doi.org/10.1016/j.nexus.2025.100364

- (Papargyropoulou et al., 2014)

  Papargyropoulou, E., Lozano, R., K. Steinberger, J., Wright, N., & Ujang, Z. B. (2014). The food waste hierarchy as a framework for the management of food surplus and food waste. *Journal of Cleaner Production*, *76*, 106–115. https://doi.org/10.1016/j.jclepro.2014.04.020

- (Robertson & Barling, 2013)

  Robertson, J. L., & Barling, J. (2013). Greening organizations through leaders' influence on employees' pro-environmental behaviors: GREEN LEADERSHIP AND EMPLOYEES' BEHAVIORS. *Journal of Organizational Behavior*, *34*(2), 176–194. https://doi.org/10.1002/job.1820

- (Schanes et al., 2018)

  Schanes, K., Dobernig, K., & Gözet, B. (2018). Food waste matters - A systematic review of household food waste practices and their policy implications. *Journal of Cleaner Production*, *182*, 978–991. https://doi.org/10.1016/j.jclepro.2018.02.030

- (Secretary-General et al., n.d.)

  Secretary-General, U. N., World Commission on Environment, & Development. (n.d.). *Report of the World Commission on Environment and Development : Note / by the secretary-general*. UN.

- (*Stake R 1995 The Art Of Case Study Research*, n.d.)

  Stake R 1995 The Art Of Case Study Research. (n.d.). Superpdf.org. Retrieved May 5, 2026, from https://superpdf.org/book/stake-r-1995-the-art-of-case-study-research-4987197

- (*Tourism and Climate Change: Global Report*, n.d.)

  Tourism and Climate Change: Global Report. (n.d.). Madrid: UNWTO.

- (Turnoff, 2023)

Turnoff. (2023, August 24). *Triple Bottom Line แนวคิดแห่งความยั่งยืน.* Thesus. https://www.thesustain.space/innovation/triple-bottom-line-%E0%B9%81%E0%B8%99%E0%B8%A7%E0%B8%84%E0%B8%B4%E0%B8%94%E0%B9%81%E0%B8%AB%E0%B9%88%E0%B8%87%E0%B8%84%E0%B8%A7%E0%B8%B2%E0%B8%A1%E0%B8%A2%E0%B8%B1%E0%B9%88%E0%B8%87%E0%B8%A2%E0%B8%B7/

- (Unknown, n.d.)
  Unknown, ไ. (n.d.). *ทฤษฎีระบบ System Theory*. Blogspot.com. Retrieved May 20, 2025, from https://poundtv5.blogspot.com/2014/10/system-theory.html
- (Whitmarsh et al., 2011)
  Whitmarsh, L., Seyfang, G., & O'Neill, S. (2011). Public engagement with carbon and climate change: To what extent is the public 'carbon capable'? *Global Environmental Change: Human and Policy Dimensions*, *21*(1), 56–65. https://doi.org/10.1016/j.gloenvcha.2010.07.011
- Wikipedia contributors. (2025a, April 15). *Systems theory*. Wikipedia, The Free Encyclopedia. https://en.wikipedia.org/w/index.php?title=Systems_theory&oldid=1285695138
- (Wikipedia contributors, 2025b)
  Wikipedia contributors. (2025b, April 24). *Stakeholder theory*
- Wikipedia, The Free Encyclopedia. https://en.wikipedia.org/w/index.php?title=Stakeholder_theory&oldid=1287143214
- (Wikipedia contributors, 2025c)
  Wikipedia contributors. (2025c, May 19). *Sustainable development*. Wikipedia, The Free Encyclopedia. https://en.wikipedia.org/w/index.php?title=Sustainable_development&oldid=1291123667#cite_note-:4-6
- (Yin, 2018)
  Yin, R. K. (2018). *Case study research and applications: Design and methods*. SAGE Publications.
- (*โรงแรมกับภารกิจรักษาโลก Green Hotel*, n.d.)
  โรงแรมกับภารกิจรักษาโลก Green Hotel. (n.d.). SGSCorp. https://www.sgs.com/th-th/news/2024/03/experience-sustainable-the-eco-friendly-haven-green-hotel-on-a-mission-to-save-the-world
- (n.d.-a)
  (N.d.-a). Retrieved May 20, 2025, from http://chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://mpra.ub.uni-muenchen.de/123287/1/MPRA_paper_123287.pdf
- (n.d.-b)
  (N.d.-b). Retrieved May 20, 2025, from http://chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.dpu.ac.th/dpurdi/upload/research/1692604073.%20%E0%B8%9B%E0%B8%A3%E0%B8%B1%E0%B8%97%E0%B8%A2%E0%B8%B8%E0%B8%A1%E0%B8%99%20%E0%B9%80%E0%B8%A5%E0%B8%9B%E0%B8%99%E0%B8%B2

%E0%B8%99%E0%B8%99%E0%B8%97%E0%B9%8C%20%E0%B9%81%E0%B8%A5%E0%B8%B0%20%E0%B8%A3%E0%B8%A8

- (n.d.-c)
  (N.d.-c). Researchgate.net. Retrieved May 5, 2026, from https://www.researchgate.net/figure/Kurt-Lewin-change-model-Lewin-1947_fig1_395182260
- (n.d.-d)
  (N.d.-d). Researchgate.net. Retrieved May 5, 2026, from https://www.researchgate.net/publication/263597050_Greening_Organizations_Through_Leaders'_Influence_on_Employees'_Pro-Environmental_Behaviors
- (n.d.-e)
  (N.d.-e). Nibmehub.com. Retrieved May 5, 2026, from https://nibmehub.com/opac-service/pdf/read/Tourism-%20Security%20and%20Safety%20_%20from%20theory%20to%20practice.pdf#page=120
- (n.d.-f)
  (N.d.-f). Retrieved May 5, 2026, from http://file:///C:/Users/Admin/Downloads/gosslingetal.2010.pdf