

Unlocking sustainability in the HORECA value chain: the power of business models

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Abstract: The HORECA value chain (hotels, restaurants, catering) significantly contributes to global environmental concerns. While generating approximately 1% of global GDP, the hospitality sector consumes a disproportionate 3% of global energy. This translates to significant greenhouse gas emissions and reliance on non-renewable resources. The sector's significant water consumption strains freshwater resources, while waste generation across food, packaging, and operations contributes to landfill overflow and pollution. These figures underscore the urgent need for the HORECA sector to prioritize sustainability. Implementing eco-friendly measures offers benefits beyond environmental impact, including improved operational efficiency and enhanced brand reputation. The value chain approach provides a holistic framework for addressing sustainability. By examining each stage, businesses can identify opportunities for improvement. This approach fosters improved resource efficiency by optimizing energy and water use, minimizing waste, and sourcing from sustainable suppliers. Greater transparency emerges as businesses can track sustainability practices throughout the chain and communicate them to consumers who are increasingly environmentally conscious. Collaboration also becomes essential, facilitating the development of innovative solutions like circular economy models or sustainable packaging alternatives. Despite the promise of the value chain approach, implementing it presents challenges. The fragmented nature of the industry, with numerous independent businesses, makes coordination difficult. Financial constraints, knowledge gaps, and limited incentives for businesses and consumers further hinder progress. Innovative business models offer a solution to bridge the implementation gap. They foster collaboration via platforms and initiatives, incentivize sustainability with rewards or green financing, and create shared value by highlighting benefits for all. This study seeks a HORECA-specific model to address its challenges and pave the way for a more sustainable future, analyzing existing models and exploring new frameworks to empower lasting change.

Keywords: HORECA, sustainability, business model, value chain.

1. Introduction

The hospitality industry (HORECA - Hotels, Restaurants, Cafes) is increasingly focused on sustainability. While environmental impact is a major concern (Bohdanowicz, 2006), sustainability goes beyond that. It includes ethical sourcing, fair labor practices, and supporting local communities. HORECA businesses that prioritize sustainability source responsibly and ensure ethical treatment of workers. Interestingly, sustainable practices can also benefit the bottom line. Reduced resource consumption and waste mean lower operational costs (Prud'homme and Raymond, 2013). Additionally, studies show a positive correlation between sustainable practices, customer loyalty, and competitiveness (Perramon et al., 2022). Business models are crucial for achieving sustainability throughout the HORECA value chain. These models function as a strategic roadmap, outlining how a business creates value while minimizing environmental impact and fostering social responsibility. Firstly, business models guide resource management. By incorporating sustainability principles, companies can identify areas to reduce resource consumption, minimize waste generation, and implement practices that lessen

their environmental footprint. Secondly, business models drive innovation in the HORECA sector. A focus on sustainability encourages the exploration of new approaches that benefit both the environment and the business. Thirdly, business models serve to align stakeholders within the HORECA value chain. This includes suppliers, employees, and customers. Sustainable models can incentivize suppliers to adopt environmentally friendly practices, motivate employees to participate in sustainability initiatives, and attract a customer base willing to pay a premium for sustainable products and services. Finally, business models ensure the financial viability of sustainability measures. These models can identify cost-saving opportunities and attract a new customer base, ensuring long-term success. Business models are a powerful tool for integrating sustainability into HORECA operations. By considering economic, social, and environmental aspects, these models pave the way for a more sustainable future. This study aims to provide a business model supporting the implementation of sustainability practices along the value chains of the HORECA sector. This paper, first, provides an overview of the existing literature. Section 3 presents the sustainable business model Canvas for the HORECA value chain

developed and validated with experts. Section 4 provides a new framework methodology for assessing and supporting the implementation of energy efficiency and sustainability measures. Finally, Section 5 summarizes the main findings, highlights key takeaways, and suggests areas for further research.

2. Literature overview

Heightened emphasis on sustainability compels businesses to find methods for achieving a harmonious "triple bottom line" (profit, people, planet) despite potential conflicts between these social, economic, and environmental goals. Several frameworks tried to address this challenge (Cardeal et al., 2020). The extended business model Canvas by Osterwalder and Pigneur (2011) added new blocks to the traditional business model Canvas for social and ecological costs and revenues. Fichter and Timann's (2015) framework asks "classic" business questions alongside sustainability-specific ones. While Joyce and Paquin (2016) propose a three-layer model for each sustainability dimension. However, integrating them vertically can be difficult. Often, many of these decisions will influence more than one dimension of sustainability, and so should be made considering the effects on all concerned dimensions. For that reason, in this study, the Fichter and Timann framework has been selected. While sustainability is gaining traction in HORECA, research on collaborative business models remains limited. Studies by Assaf et al. (2012) and Pérez & del Bosque (2014) suggest a link between environmental reporting and hotel performance, highlighting the value of transparency. Sustainability reporting frameworks, like the Materiality Balanced Scorecard (Guix & Font, 2020), offer promise, but improved transparency and impact measurement are needed. Mihalič et al. (2012) developed a framework (HSBM) to assess hotel sustainability, revealing a focus on

economics over social and environmental aspects. Kim et al. (2018) proposed a literature review on sustainability research in the hotel industry, defining consumer behavior, marketing implications, and sustainable management and education as the more relevant key areas for improvement. Arisandi et al. (2023) provided insights into sustainability initiatives in Singapore luxury hotels. Bonadonna et al. (2019) highlight a consumer preference for local, sustainable cuisine. Recognizing the need for a tailored sustainability approach, this study addresses the implementation gap in the HORECA sector, especially for SMEs, by developing frameworks that empower value chains to adopt and benefit from sustainable business models.

3. Sustainable Business Model Canvas for the HORECA value chains

The Sustainable Business Model Canvas offers a powerful framework for organizations to design and evaluate their value chain with a focus on sustainability. Moving beyond traditional profit-first models, it integrates environmental and social considerations into core business strategies. This "triple bottom line" approach considers economic success, environmental impact, and social well-being. The canvas acts as a visual map, highlighting interconnected business components and their impact on sustainability goals. It also considers positive and negative externalities, allowing businesses to strategically minimize negative environmental or social impacts while maximizing positive ones. By fostering clear communication through visualization, the canvas becomes a valuable tool for discussions with investors, partners, and stakeholders caring about a company's environmental and social responsibility. Figure 1 provides a detailed structure of this model specific to the HORECA sector, discussed in the following sections.

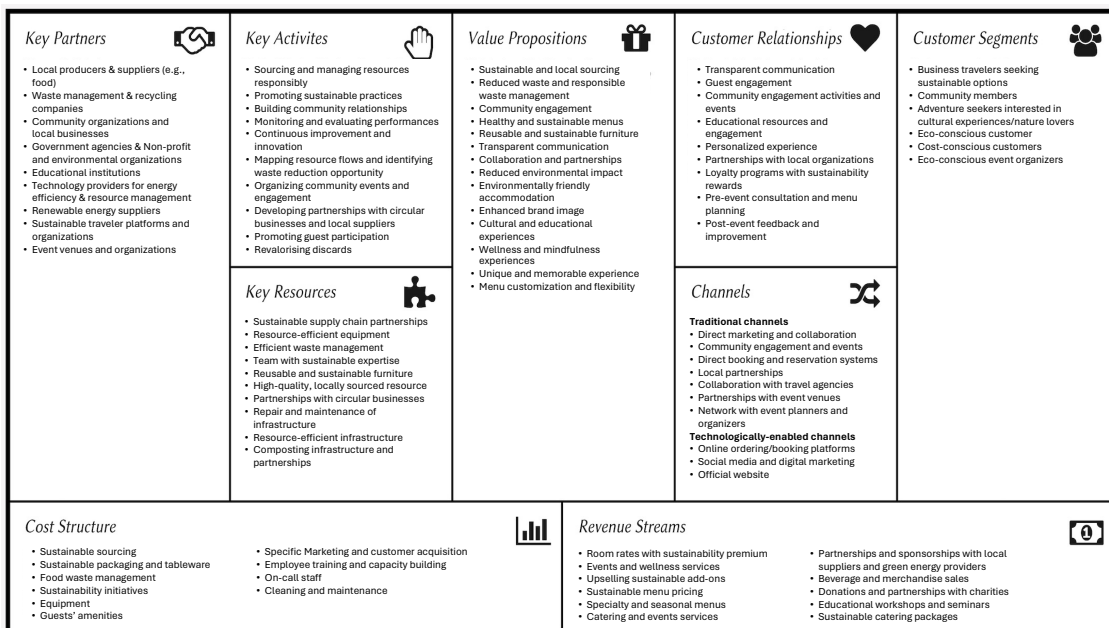


Figure 1: HORECA sustainable business model Canvas.

3.1 Key Partners

The Sustainable Business Model Canvas necessitates the establishment of strategic alliances with key partners to achieve the HORECA sustainability goals. These partnerships create a collaborative network that supports environmentally friendly practices throughout the supply chain. Key partnerships include:

- Environmentally conscious travel platforms and sustainable tourism organizations: Reaching a target audience aligned with HORECA's values.
- Local farms, businesses, and suppliers: Sustainable flow of goods and services, minimizing transportation and environmental impact, while supporting the local community and ensuring transparency.
- Renewable energy suppliers: Cost reduction and progress towards sustainability goals through access to clean energy sources.
- Waste management and recycling companies: Proper waste disposal and minimizing environmental impact.
- Government agencies, non-governmental organizations, and educational institutions: fostering sustainable tourism, knowledge exchange, collaborative efforts, and equipping future hospitality professionals with sustainability skills.
- Non-profit organizations: Broaden the positive impact on environmental awareness, food security, or sustainable agriculture.
- Local businesses and social spaces: Co-hosting events promoting sustainability in the community.
- Event venues with similar goals: Strengthening the collective commitment to a sustainable future.

3.2 Key Activities

The model further outlines key activities that translate resources into sustainable operations. The main are:

- Resource Efficiency: Regular monitoring and technology optimize energy and water use while minimizing waste through responsible sourcing and promoting circular practices or responsible product-as-a-service models.
- Circular Economy: Analyzing resource flows identifies opportunities for waste minimization, reuse, and recycling through partnerships with circular businesses.
- Local Community Engagement: Collaborations with local businesses, producers, and initiatives foster environmental awareness and broader positive impact creating opportunities for

cultural exchange through responsible tourism practices.

- Continuous Improvement: Regular monitoring, evaluation, and data-driven adaptation ensure the model evolves alongside best practices.
- Guest/Customer Engagement: Educational programs, responsible waste management options, and participation in sustainable practices empower guests and customers.

3.3 Key Resources

The eco-businesses in the HORECA sector should prioritize resources that align with their sustainability goals. This means:

- Sustainable Infrastructure and Supplies: Energy-efficient infrastructure, renewable energy sources, resource-saving equipment (e.g., compostable tableware), sustainable building materials, and partnerships with local, environmentally responsible suppliers.
- Waste Reduction: Composting systems, recycling programs, proper disposal procedures, and innovative food storage solutions to minimize spoilage.
- Sustainable Technology: Utilizing technology for resource monitoring, management, and guest engagement related to sustainability initiatives.
- Sustainability-Empowered Team: A team with expertise in circular practices, sustainable sourcing, and responsible food handling, actively promoting the restaurant's sustainability mission, ensuring comprehensive knowledge, and fostering a culture of environmental responsibility within the team.
- Responsible Resource Management: Partnering with local producers, minimizing food waste through smart and seasonal menu planning and portion control, water and energy conservation, utilizing food-sharing apps, and repurposing leftover ingredients.
- Sustainable Dining Experience: Offering reusable containers and tableware for dine-in, compostable or recycled packaging for takeout, promoting responsible portions, allowing guests to opt out of single-use items, and similar initiatives.

3.4 Value Propositions

The value proposition focuses on a multi-pronged approach to sustainability:

- Environmentally Friendly Practices: Experience environmentally friendly accommodations, with renewable energy sources, energy-efficient technologies, and sustainable operations that minimize the environmental footprint.

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- **Local Sourcing and Seasonal Ingredients:** Support local communities (e.g., local farmers) and minimize transportation emissions through local sourcing and seasonal menus.
- **Waste Reduction and Responsible Management:** Minimize waste generation through menu planning, compost food scraps, promote responsible recycling and disposal, implement pre-order systems, practice responsible portion control, and donate surplus food.
- **Community Engagement and Cultural Experiences:** Foster connections with the local community to support local businesses and social integration through responsible tourism practices and cultural experiences, supporting local producers, hosting events, and offering educational experiences.
- **Wellness and Mindfulness:** Offer facilities and activities promoting well-being and connection with nature.
- **Sustainable Menus and Packaging:** Promote healthy and sustainable dining with fresh, customizable seasonal dishes and arrays of vegetarian and vegan options. Utilize reusable, compostable, or recycled materials for packaging and tableware.
- **Transparency:** Communicate sourcing practices, sustainability initiatives, and social impact through menus, websites, and signage to **build trust with clients.**

3.5 Customer Relationships

The Sustainable Business Model Canvas paints a comprehensive picture of how the HORECA businesses should cultivate customer relationships and generate revenue streams while adhering to sustainability principles. The main strategies are:

- **Transparency through Communication:** Regularly inform guests about the sustainability efforts, certifications, and progress through various channels.
- **Engagement Programs:** Empower guests to contribute to the sustainability goals by offering opportunities to participate in sustainable practices during their stay, fostering a sense of shared responsibility.
- **Loyalty Programs with Environmental Incentives:** Reward guests for making eco-conscious choices and participating in environmental initiatives.
- **Community Engagement Initiatives:** Extend the business’s commitment to sustainability beyond

its walls by inviting guests to participate in social and environmental activities that promote well-being. For instance, zero-waste cooking workshops or composting talks to promote sustainability education.

- **Educational Experiences for Customers:** Offer workshops or experiences to elevate guests’ and customers’ awareness about responsible consumption habits and circular economy principles and empower them to adopt sustainable practices in their daily lives.
- **Partnerships with Local Organizations:** Collaborate with local food banks or composting companies to ensure responsible solutions for surplus food or unavoidable waste.
- **Collaborative Menu Planning:** Partner with clients during pre-event consultations to craft sustainable menus reflecting dietary needs and budget considerations.
- **Continuous Improvement Through Customer Feedback:** Utilize post-event feedback, particularly regarding sustainability aspects, to continuously enhance catering services.

3.6 Channels

Reaching environmentally conscious consumers requires a multifaceted communication strategy and a variety of channels for hotels, restaurants, and catering services. Hotels can leverage partnerships with sustainable travel platforms and a clear, informative website to ensure visibility among eco-conscious travelers. Social media and digital marketing further amplify their sustainability message. Additionally, collaborating with local tourism agencies and community events allows them to position themselves within a broader sustainable tourism experience. Restaurants should utilize a multifaceted approach. Offering online ordering options, including partnerships with sustainable delivery platforms, allows for convenient access for eco-conscious customers. Active social media engagement fosters connections with potential customers and showcases sustainable practices implemented, while local partnerships create opportunities for co-created events, showcasing local products, and promoting community initiatives. Further connection with the community can be built by hosting farmers’ markets, educational workshops, and farm-to-table dinners. Effective communication strategies are essential also for sustainable catering services. A user-friendly online booking platform serves as a central hub for both client interaction and showcasing sustainable practices. Furthermore, it provides comprehensive information about the company's mission and values, alongside enticing menus, client testimonials, and seamless booking functionalities. Collaborations with event venues committed to sustainability foster mutual promotion and extend reach by offering bundled services. A vibrant social media presence fosters community, showcases culinary creativity, and promotes community engagement

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initiatives. Additionally, participating in relevant conferences and industry events builds relationships with event planners who share similar values fostering the exchange of ideas and best practices, ensuring the company remains at the forefront of sustainable catering practices. Finally, participation in farmers’ markets, local food festivals, and community gatherings strengthens local ties and reinforces the company's commitment to local sourcing and social responsibility.

3.7 Customer Segments

The Sustainable Business Model Canvas for the HORECA value chain prioritizes a clientele that embraces eco-conscious practices. This encompasses several key segments:

- **Eco-Conscious Customers:** Eco-tourists seeking minimal environmental impact during their stays. Eco-Conscious Event Planners prioritizing environmental responsibility during events.
- **Sustainable Businesses:** Business travelers representing companies with sustainability goals.
- **Local Community:** Residents utilizing facilities for events, dining, or wellness services, and appreciating local sourcing and community engagement initiatives. Groups that support local producers and contribute to community development.
- **Health-Conscious Consumers:** Patrons who value eco-conscious practices and health-focused cuisine with fresh, local ingredients and convenient, sustainable dining options.
- **Value-Conscious Diners:** Customers seeking affordability alongside a commitment to sustainability.
- **Plant-Based Consumers:** Individuals with vegetarian or vegan dietary preferences.
- **Cost-Conscious Customers:** Budget-minded clients seeking competitive pricing alongside sustainable practices.

3.8 Cost structure

The cost structure associated with this model reflects the investments required for sustainability. The main cost drivers are related to:

- **Sustainable Infrastructure:** Upfront investment for renewable energy sources, energy-efficient appliances, water-saving equipment, composting systems, and sustainable building materials.
- **Sustainable Sourcing:** Responsible, local, and ethical suppliers may have higher costs, potentially requiring more frequent deliveries compared to consolidated shipments. Biodegradable or reusable packaging and fair trade certifications verifying ethical, and sustainable practices further elevate costs.

- **Operational Maintenance:** Sustainable equipment maintenance, training for staff on sustainable practices, and ongoing compliance with regulations require ongoing investment.
- **Marketing and Education:** Specific marketing for eco-tourism initiatives (e.g., printed advertisements, online marketing, social media campaigns, publicity, and promotion) and educational events come at a cost.

At the same time, the following cost-reduction Strategies can be faced:

- **Energy Efficiency:** Investing in energy-efficient appliances and building features reduces utility costs and environmental impact.
- **Resource Conservation:** Implementing water-saving measures, minimizing waste, and utilizing waste-to-energy solutions contribute to cost reduction.
- **Local Sourcing:** Minimizes transportation expenses and supports local communities.
- **Technology Utilization:** Smart building management systems, automated energy control, and data analysis optimize resource usage and minimize operational costs.
- **Local Partnerships:** Collaborations with local businesses for services like laundry or linen cleaning can offer cost-effective and sustainable alternatives.

3.9 Revenue Streams

The Sustainable Business Model Canvas for the HORECA value chain prioritizes a balance between environmental responsibility and financial viability. The main revenue streams are:

- **Pricing Strategy:** Room rates incorporate a slight premium reflecting the investment in sustainability, with upselling opportunities for eco-friendly add-ons (such as in-room carbon offset programs or locally sourced toiletries). Catering's clients might pay a slight premium for the value proposition of local sourcing, sustainable packaging, and reduced food waste.
- **Food & Beverage:** The focus is on locally sourced, seasonal ingredients and diverse dietary options (including vegetarian and vegan options), generating revenue through on-site restaurants, cafes, and room service.
- **Partnerships and Sponsorships:** partnerships and sponsorships with brands and organizations that share the commitment to sustainability to amplify impact and generate revenue. This includes collaborations with local suppliers, green energy providers to offer renewable energy options to guests, and

sustainable tour operators to curate eco-friendly experiences. Bundled packages with event venues and educational workshops or resources provided to catering clients or the broader community generate additional revenue streams.

- Value-Based Pricing: Competitive menu pricing reflects the investment in sustainability, with the option for a slight premium to support these efforts.
- Sustainable Menu Customization: Customers can further contribute by choosing premium menu options featuring local specialty ingredients or ethically sourced food. Revenue is generated through sustainable beverage options, branded merchandise potentially made from recycled materials, and seasonal menus featuring fresh and local ingredients.
- Community Collaborations: Partnerships with local businesses or organizations create awareness and revenue through co-branded promotions or events.

4. Framework for value chain’s energy efficiency

This methodological process leverages three analytical tools to comprehensively assess and implement energy efficiency measures within a value chain:

Step 1: Value Chain Energy Mapping and Hot Spot Identification

The value chain model serves as the foundation for this approach. It facilitates a detailed analysis of energy consumption across each stage of the value chain, disaggregated by energy vector (e.g., electricity, natural gas). This granular breakdown enables the identification of "hotspots" – stages with the highest energy consumption. By pinpointing these hotspots, stakeholders can prioritize the implementation of energy efficiency measures (EEMs).

Step 2: Economic Feasibility Assessment using the Life Cycle Cost (LCC) Model

Once the most relevant EEMs are selected based on their potential impact on hotspots, the Life Cycle Cost (LCC) model comes into play. This tool allows for a rigorous evaluation of the economic viability of each shortlisted EEM. By considering the initial investment costs, operational savings, and project lifespan, the LCC model provides crucial insights for prioritizing EEM implementation based on their financial attractiveness.

Step 3: Strategic Assessment of Non-Energy Benefits (NEBs)

The final step incorporates the NEBs model. This tool goes beyond just economic considerations to evaluate the associated non-energy benefits of the shortlisted EEMs. These benefits can encompass a wide range of factors, such as improved product quality, reduced maintenance requirements, or enhanced worker safety. By quantifying these NEBs and assessing their strategic relevance,

stakeholders gain a more holistic understanding of the value proposition associated with each EEM.

Figure 2 defines the framework of the integrated model developed under this project exploiting also already existing tools developed in other EU-funded projects (i.e., LCC and NEBs tools have been developed under the H2020 project “Improving Cold Chain Energy Efficiency, ICCEE – Diaz et al., 2022).

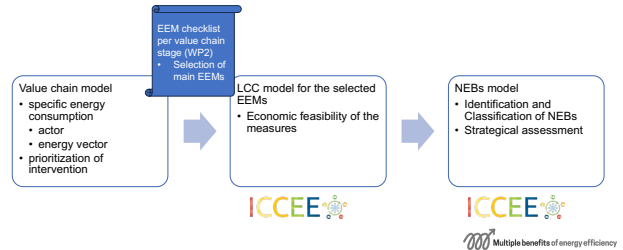


Figure 2: Framework of the integrated model.

5. Conclusions

The hospitality industry is facing a new challenge - going green. Traditionally focused on profit, HORECA businesses now need to integrate environmental and social responsibility into their operations. This paper proposes a novel Sustainable Business Model Canvas, focused on the collaboration among the value chain actors. This model prioritizes resource conservation. Hotels and restaurants can use energy-efficient appliances and water-saving features. Partnering with local, eco-friendly farms reduces emissions and fosters a responsible supply chain. Waste minimization is key, with composting programs and guest participation encouraged. The model expands beyond the environment to focus on social well-being. Fair labor practices throughout the supply chain ensure the ethical treatment of workers.

Locally sourced ingredients guarantee they're not procured unethically. Community involvement is also encouraged. Hotels can partner with local businesses, while restaurants can source locally, strengthening the community's social and economic fabric. The model proves that sustainability can be economically beneficial. Resource efficiency translates to cost reduction. Local sourcing minimizes transportation costs and builds stronger relationships with local businesses.

Additionally, eco-conscious customers are a growing market segment. By embracing sustainability, HORECA businesses can attract this clientele and create a new revenue stream. Implementing this model requires strategic partnerships with eco-conscious suppliers, renewable energy providers, and responsible waste management companies. Investments in sustainable infrastructure, employee training, and marketing eco-friendly initiatives are needed. However, these are balanced by long-term cost savings and attracting new customers. Strong stakeholder relationships are crucial. Transparency about sustainability efforts, encouraging guest participation, and actively engaging with the local

community are all essential for success. The present work proposes an analysis of the sustainable business model Canvas offering a powerful framework for organizations to design and evaluate their value chain through a sustainability lens. The Sustainable Business Model Canvas empowers HORECA businesses to become responsible players.

Furthermore, an integrated framework is developed for assessing the current energy performance of the HORECA value chains, identifying the most promising energy efficiency measures, and evaluating their impact on the value chain in terms of energy consumption, costs, and non-energy benefits. By adopting this framework, they can achieve economic success while minimizing their environmental impact and fostering social well-being. This paves the way for a more sustainable future for the hospitality industry, the environment, and the communities it serves. The model allows HORECA to not just serve delicious dishes and comfortable stays, but to also build a sustainable plate for all.

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