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Deliverable 3.5 Report on the benchmarking activities

Co-funded by the European Union

Summary

INTRODUCTION

The EE4HORECA project brings together 12 partners from 7 countries and focuses on the value chain approach to test and validate the economic viability of collaborative models in greening value chains and to propose benchmarks and standards inputting regulatory and policy improvements. All the activities are focused on supporting companies and staff in the implementation of energy efficiency measures, business models, and benchmarks for greening the HORECA value chain.

The project focuses its activities in the following NACE sectors: accommodation and food service activities (NACE Code: I55 to I56.3.0)

The present work is part of the WP3 that will propose business models and benchmarking for improving the sustainability of the value chain of the HORECA sector.

The overall objectives of the present WP aim to:

- Assess the relevant resource flows of the supply chain and define best practices to improve their sustainability.
- Develop an integrated economic model through a life cycle perspective with considerations of the non-energy benefits.
- Evaluate the untapped potential of energy efficiency and renewable at each step of the value chain once gathered data directly from the supply chain investigated.
- Create a benchmarking tool focused on energy use at the value chain level.

The present report investigates data collected for benchmarking at the different stages of the value chain. Furthermore, some case studies from the HORECA sector analyzing the relevance of benchmarking activities are presented.

The present work is Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

BENCHMARKING PROCESS

Benchmarking is a systematic process that involves comparing an organization's practices, processes, and performance metrics with those of industry leaders or best-in-class organizations. This comparative analysis provides valuable insights into areas where improvements can be made, enabling organizations to enhance efficiency, reduce costs, and ultimately improve overall performance.

The main types of benchmarking are:

- Internal Benchmarking: Comparing different departments or units within an organization to identify best practices and areas for improvement.
- Competitive Benchmarking: Comparing an organization's performance with direct competitors in the same industry.
- Functional Benchmarking: Comparing specific functions or processes within an organization with those of best-in-class organizations, regardless of industry.
- Strategic Benchmarking: Comparing an organization's overall strategy and strategic objectives with those of successful competitors or industry leaders.

Benchmarking offers numerous benefits for organizations, including:

- Identifying performance gaps: By comparing performance to industry leaders, organizations can pinpoint areas where they are lagging and take corrective actions.
- Setting realistic goals: Benchmarking helps establish achievable performance targets based on the performance of top performers.
- Learning from best practices: By studying the practices of successful organizations, organizations can adopt and adapt best practices to improve their operations.
- Enhancing efficiency and productivity: Benchmarking can help identify areas where processes can be streamlined, and resources can be optimized.
- Reducing costs: Organizations can implement cost-saving measures by identifying areas where costs are higher than industry standards.
- Improving competitiveness: Benchmarking can help organizations stay competitive by ensuring that they stay current with industry trends and best practices.

While benchmarking offers numerous advantages, it is important to consider the potential challenges. Table 1 presents the main advantages and disadvantages.

Table 1. Pros and cons of benchmarking

Pros:	**Cons:**
Provides valuable insights into performance gaps and opportunities for improvement.	Can be time-consuming and resource intensive.

Helps set realistic performance targets.	May require sharing sensitive information with competitors.
Facilitates learning from best practices.	Can be difficult to find suitable benchmarks, especially in niche industries.
Enhances efficiency, productivity, and competitiveness.	May not always be applicable to all organizations or industries.
Can lead to cost reduction.	

Benchmarking is a valuable strategic tool that can help organizations improve their performance and stay competitive, by carefully selecting the appropriate type of benchmarking and indicators for addressing potential challenges.

METHODOLOGY

The existing literature reveals a significant absence of data on individual actors within the HORECA sector, especially regarding their energy consumption and environmental impact. To address this gap, direct company contact was necessary. A survey was conducted among various European companies to gather insights into the current state of HORECA businesses. The survey was not confined to a specific company type. Still, it was administered to diverse entities, including those involved in supply chains and transportation, as well as HORECA establishments such as hotels, restaurants, and catering services. This diversity ensures comprehensive and representative research findings for the HORECA sector. Data for benchmarking was collected both directly through questionnaires and indirectly using data from previous projects and reports. The collected data was entered into a database, processed, and categorized to facilitate analysis and removal of inaccurate or irrelevant information.

The questionnaire was tailored to the unique operational aspects and energy consumption patterns of supply chain and transportation companies versus HORECA businesses. For supply and transportation activities, the questionnaire was divided into sections covering company description, annual product demand, storage and transportation requirements, and energy consumption. For HORECA businesses, the questionnaire focused on general company information, raw material procurement, service offerings, and energy consumption. Data collected through the questionnaires was centralized into a single database for easy accessibility and analysis.

Benchmarking was selected as a strategic tool to analyze the logistics chain and activities within the HORECA sector. Benchmarking data was used to establish reference values for evaluating energy efficiency improvements. The Specific Energy Consumption (SEC) metric was chosen as a key performance indicator (KPI) for benchmarking operations. SEC measures the energy consumption per unit of output and it is valuable for identifying energy efficiency opportunities and comparing performance across similar entities. Furthermore, other indicators were analyzed: i.e., the economic and environmental performance per unit of output (i.e., the specific economic and environmental impacts, respectively), and the share of the energy carriers. Data collected refer to the single actors and are then used for the evaluation of the value chain, and so they are converted to guest nights or food covers.

BENCHMARKING DATASET

This section presents the data pertinent to the benchmarking activities, used also in the forthcoming case studies. To safeguard confidentiality, company names have been replaced with anonymized codes and aggregated in the subsequent analyses.

Food and beverage suppliers

Benchmarking data for the food and beverage suppliers was gathered from companies of varying sizes and product categories within the food and beverage industry, encompassing meat, dairy products, bread, fruit, beverages, and more. Moreover, some companies engage in activities beyond production and processing, such as logistics, storage, wholesale, and retail. Table 2 presents a detailed analysis of specific energy consumption, highlighting the minimum, average, and maximum values among these suppliers.

Table 2. Specific energy consumption data gathered directly from food and beverage suppliers for different energy sources

	SEC [kWh/kg]		
	Min	*Avg*	*Max*
Electricity	0.110	0.540	0.892
Natural gas	0.101	0.661	1.221
Gas/Diesel oil	0.001	0.066	0.150

In addition to the comprehensive dataset collected through primary sources, secondary data from relevant literature and existing energy audits and reports was meticulously integrated to enhance the analysis. Table 3 presents the literature-based data, providing valuable insights and contextual information that complements the primary data for the food and beverage supplier. This combined approach ensures a robust and well-rounded understanding of the energy consumption patterns and efficiency levels within the sector.

Table 3. Specific energy consumption for different food and beverage products from literature[1]

Product	**SEC [kWh/kg]**
Meat	0.760 – 1.374
Fruit & Vegetables	0.1 – 0.7
Dairy	0.842
Beverages	0.046 – 0.263
Fish	0.669

[1] Corigliano O., Algieri A. (2024) A Comprehensive Investigation on Energy Consumptions, Impacts, and Challenges of the Food Industry. Energy Convers. Manag. X, 23, 100661. https://doi.org/10.1016/j.ecmx.2024.100661.

The survey results enabled the estimation of the proportional distribution of various energy carriers (Table 4). Electricity emerged as the primary energy carrier, primarily driven by the critical cooling and refrigeration requirements necessary to maintain product quality. This finding underscores the significant role that temperature control plays in the energy consumption of the food and beverage sector, highlighting the need for efficient and sustainable refrigeration technologies[2].

Table 4. Minimum, average, and maximum share of the energy carriers for the food and beverage supplier

	Share		
	Min	*Avg*	*Max*
Electricity	29%	94%	100%
Natural gas	0%	1%	11%
Gas/Diesel oil	0%	5%	71%

Laundry service provider

Table 5 presents a comprehensive benchmarking analysis of laundries, encompassing both small-scale and industrial-scale operations to accurately reflect the diverse realities within the HORECA sector. These SEC values were subsequently categorized into electricity and natural gas consumption, revealing significant variations among companies (Table 6). This variation can be primarily attributed to the type of technology employed in the laundry and the company's strategic approach to energy utilization. Factors such as the efficiency of washing machines, dryers, and boilers, as well as the implementation of energy-saving measures, significantly impact the overall energy consumption of laundries.

Table 5. Specific energy consumption data gathered directly from laundry service providers for different energy sources

	SEC [kWh/kg]		
	Min	*Avg*	*Max*
Electricity	0.309	0.586	0.910
Natural gas	0.095	0.330	0.537

Table 6. Minimum, average, and maximum share of the energy carriers for the laundry service provider

	Share

[2] JRC Science and Policy Report (2015). Energy use in the EU food sector: State of play and opportunities for improvement.

	Min	*Avg*	*Max*
Electricity	42%	65%	77%
Natural gas	23%	35%	58%

Transportation activities

Table 7 presents the benchmarking data for transportation, where specific energy consumption is expressed in kWh/kg, representing fuel consumption per kilogram transported. A weighted average was calculated for each company's fleet of vehicles, considering vehicle type and distance traveled to determine fuel consumption per trip and load transported. In this evaluation, the key variables influencing the results are the vehicle load capacity, the average distance traveled per liter of fuel, the average trip length, and the refrigeration requirements. These factors collectively determine the overall energy efficiency of the transportation process. A high vehicle saturation rate, coupled with efficient fuel consumption and shorter average trip distances, can significantly contribute to reducing energy consumption. Additionally, the presence or absence of refrigeration requirements plays a crucial role, as refrigeration systems can consume substantial amounts of energy.

Table 7. Specific energy consumption data gathered directly from transportation service providers

	SEC [kWh/kg]		
	Min	*Avg*	*Max*
Gas/Diesel oil	0.010	0.241	1.648

Ho.Re.Ca

Benchmarking data for hotels, restaurants, and catering are presented in Tables 8 and 9. The SEC is used as a reference value, with the unit of measurement varying based on the type of activity. For restaurants and catering, SEC is expressed in kWh/food cover, while for hotels, it is expressed in kWh/guest night. Unlike other activities in the value chain, where consumption is measured per kilogram produced or transported, the focus here is on measuring consumption per customer utilizing the facility.

Table 8. Specific energy consumption data gathered directly from the HORECA businesses defined as (*) kWh/food cover for restaurants and catering services and kWh/guest night for hotels

		SEC [kWh/unit of activity*]		
		Min	*Avg*	*Max*
Restaurant	Electricity	0.203	2.907	4.458

	Natural gas	0.172	2.298	6.015
Catering	Electricity	0.013	1.593	5.142
	Natural gas	0	1.270	2.851
Hotel	Electricity	0.191	9.995	29.839
	Natural gas	1.684	13.161	28.509

Table 9. Minimum, average, and maximum share of the energy carriers for the HORECA businesses

		Share		
		Min	*Avg*	*Max*
Restaurant	Electricity	3%	60%	96%
	Natural gas	4%	40%	97%
Catering	Electricity	1%	43%	100%
	Natural gas	0%	57%	99%
Hotel	Electricity	1%	42%	62%
	Natural gas	38%	58%	99%

Restaurants and catering services exhibit diverse energy consumption levels, with higher consumption often observed in high-end establishments or those located in tourist areas. Factors such as extensive services, outdated equipment, and large annual food covers can contribute to increased energy use. Catering services vary in size and energy consumption, with smaller services potentially relying solely on electricity and larger ones utilizing both electricity and natural gas. Hotels also demonstrate varying energy consumption patterns, with high-end establishments offering a wide range of services tending to have higher consumption. Hotel size and the age and efficiency of energy systems play a significant role in determining energy usage. Some hotels utilize district heating, which, generally, leads to reduced natural gas consumption.

CASE STUDIES

Hotel value chain

The hotel considered is a four-star establishment situated in Latvia, offering 150 rooms and welcoming approximately 30,000 guests annually. During peak seasons, the average room occupancy reaches 90%, while it falls to 60% during off-peak periods. The hotel provides a range of services to guests, including a bar, restaurant, spa, gym, swimming pool, and various activities. As the hotel does not have an in-house laundry, it outsources linen cleaning services. The hotel's energy consumption is substantial, with an annual usage of 800,000 kWh of electricity and 50,000 m³ of gas. Additionally, 10,000 liters of fuel are consumed annually, partially for guest activities. The hotel annually procures about 60,000 kg of food for the restaurant, distributed among frozen, fresh, and ambient temperature products from strategic suppliers. Figure 1 illustrates the hotel value chain's energy consumption expressed in kWh/guest night, with details on the stage of the value chain and the energy carriers.

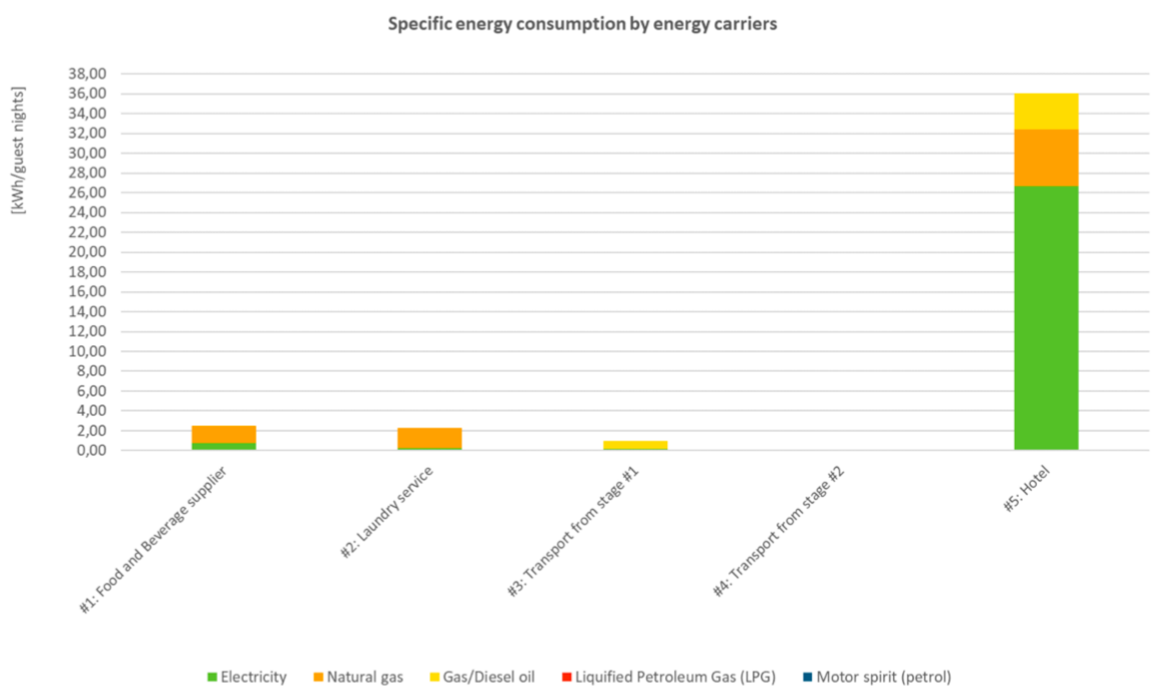
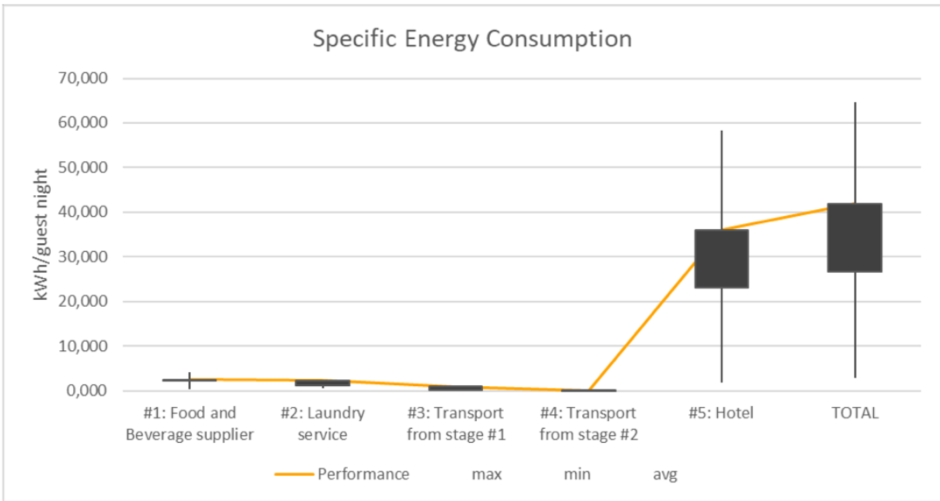
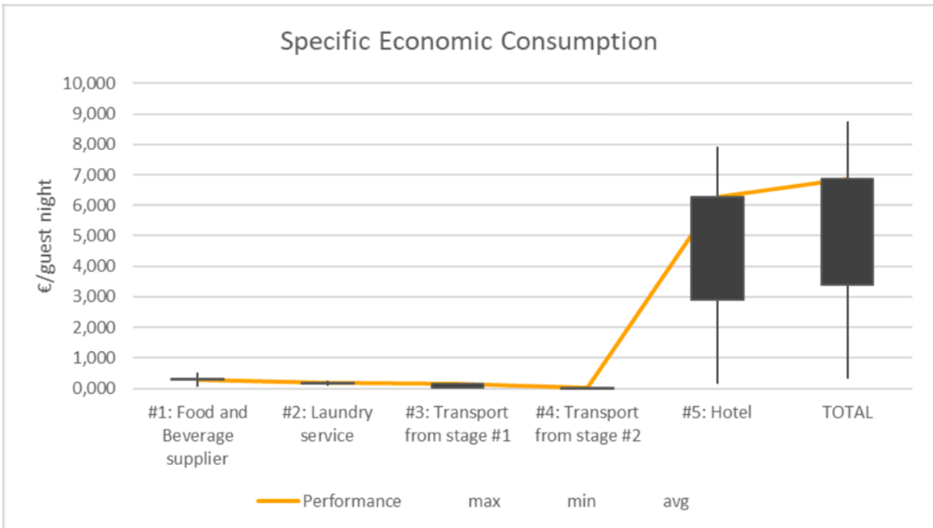


Figure 1. Specific energy consumption per activity and energy carrier of the hotel value chain

As depicted in Figure 1, the hotel itself accounts for the majority of energy consumption, particularly electricity used per guest, which amounts to about 27 kWh/guest night. This high consumption can be attributed to the numerous services offered, including pool heating (20% of total consumption), the HVAC system (30%), and guest room electricity (20%). To reduce electricity consumption per guest, optimizing the HVAC system's operation, such as implementing timers, could be considered. Pool heating, while a significant energy consumer, might be more costly to regulate. Installing dimmers in hotel rooms or replacing lights with LED bulbs could also reduce electricity consumption. Natural gas consumption stands at 5.7 kWh/guest night. Although seemingly high, this consumption is reasonable given Latvia's winter temperatures and the need to maintain a comfortable internal temperature. The hotel's bar and restaurant also contribute to gas consumption. Proper maintenance of the heating system and staff training on temperature regulation can enhance energy efficiency. Figure 1 also highlights the high gas consumption of the external laundry service, which washes approximately 36,000 kg of linen annually. This consumption might be attributed to outdated equipment, and upgrading machinery or implementing heat recovery systems could reduce natural gas usage. Figure 2 presents the benchmarking results for the Latvian Hotel, analyzing specific energy consumption (kWh/guest night), specific economic consumption (€/guest night), and specific environmental consumption (kg CO_2/guest night).





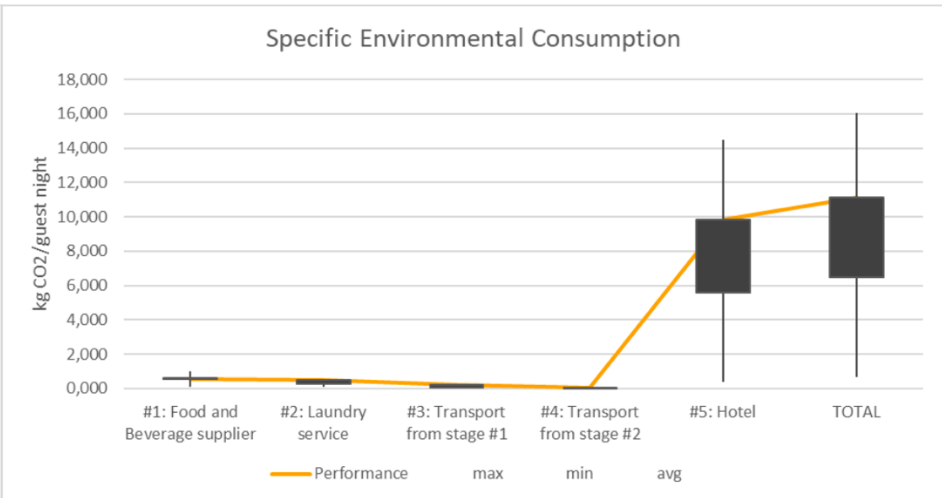


Figure 2. Benchmarking performance of the hotel value chain

None of the activities within the value chain meet the established benchmarking best practices values. Notably, the hotel exhibits the highest deviations from the benchmarking dataset. Hence, it represents the activity within the value chain that necessitates a greater focus on energy efficiency interventions. The facility's specific energy consumption exceeds average benchmarking levels by 12.9 kWh/guest night, specific economic consumption by 3.4 €/guest night, and specific environmental consumption by 4.2 kg CO2/guest night. The data indicates that the hotel will require several energy efficiency interventions, including reducing energy consumption from lighting and HVAC systems and implementing measures to reduce natural gas usage. Furthermore, food transportation exhibits a specific energy consumption that exceeds average benchmarking values by 0.87 kWh/guest night. Additionally, the specific economic consumption is 0.136 €/guest night higher than average benchmarking levels, and the specific environmental consumption surpasses average benchmarking levels by 0.20 kg CO2/guest night. These findings underscore the need for energy efficiency improvements in transportation from suppliers to the hotel. While the food supplier's specific energy consumption exceeds average reference levels by 0.10 kWh/guest night, interventions were deemed unnecessary as its specific economic and environmental consumption aligns with average reference levels, with respective values of -0.04 €/guest night and -0.01 kg CO2/guest night. The external laundry's specific energy consumption surpasses average benchmarking values by 1.20 kWh/guest night. The specific economic and environmental consumption also exceed average benchmarking levels by 0.02 €/guest night and 0.198 kg CO2/guest night, respectively. In this case, implementing energy efficiency measures to reduce natural gas consumption could be beneficial. The transportation of laundry to the hotel demonstrates that all three SEC values are slightly above benchmarking levels, suggesting the potential for energy efficiency improvements by reducing the number of trips. In conclusion, recommended energy efficiency measures can include: 1. Reducing the number of trips for linen transportation from the external laundry service to the hotel. 2. Utilizing portable refrigerated units to reduce energy consumption during food transportation to the hotel. 3. Installing a heat pump system for water heating to reduce gas consumption in the external laundry. 4. Implementing an energy management system in the hotel. 5. Replacing traditional light bulbs in the hotel with LED bulbs. 6. Providing staff training for hotel employees. 7. Installing a water cycle optimization system in the hotel.

Restaurant value chain

The restaurant, situated in Spain, is a medium-sized establishment serving approximately 26,992 covers per year with an average table occupancy rate of 87%. The restaurant exclusively utilizes fresh and ambient temperature food and beverages. The establishment also offers internal services such as a bar and cleaning, managed by its staff. However, laundry services are outsourced to an external company. Despite its medium size, the restaurant consumes a substantial amount of electricity, approximately 122,494 kWh per year. Figure 3 illustrates the restaurant value chain's energy consumption expressed in kWh/food cover.

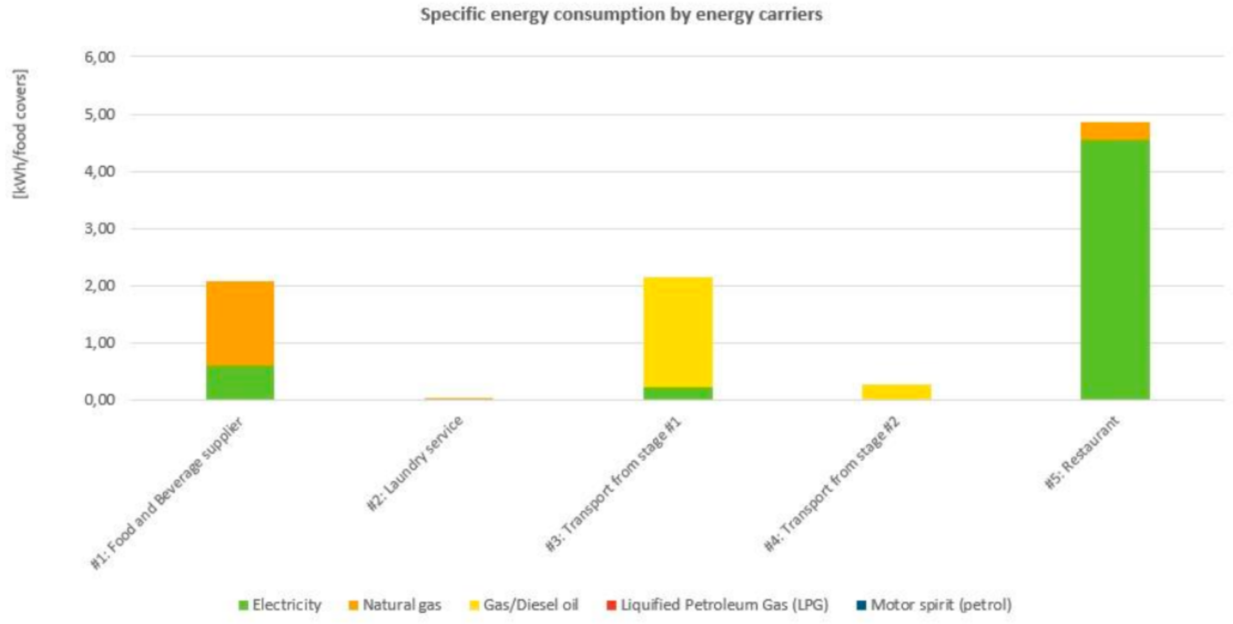


Figure 3. Specific energy consumption per activity and energy carrier of the restaruant value chain

The restaurant annually receives 20,784 kg of fresh food and beverages and 23,784 kg of ambient temperature products from strategic suppliers. While these quantities are not excessive, the number of trips made to source raw materials is relatively high, with 416 trips for fresh products and 520 for ambient temperature products. This high number of trips leads to excessive diesel consumption, indicating inefficient transport logistics management. Regarding the restaurant's electricity consumption, 68.07% is attributed to heating, ventilation, and air conditioning (HVAC) systems, 2.86% to the lighting system, and 9.96% to refrigeration systems. The remaining 20% is related to gas and water consumption. While all values are within acceptable ranges, the HVAC consumption suggests the possibility of outdated systems or inadequately trained staff in setting and controlling these systems. The food supplier's specific energy consumption is relatively high at about 2.1 kWh/food cover. The primary issue lies in excessive gas consumption, reaching about 1.5 kWh/food cover. Energy efficiency measures could be implemented to reduce these energy costs, such as ensuring system integrity, performing proper maintenance, or replacing outdated equipment with more modern and efficient alternatives. Figure 4 presents the benchmarking results for the Spanish restaurant, analyzing specific energy consumption (kWh/food cover), specific economic consumption (€/food cover), and specific environmental consumption (kg CO_2/food cover).

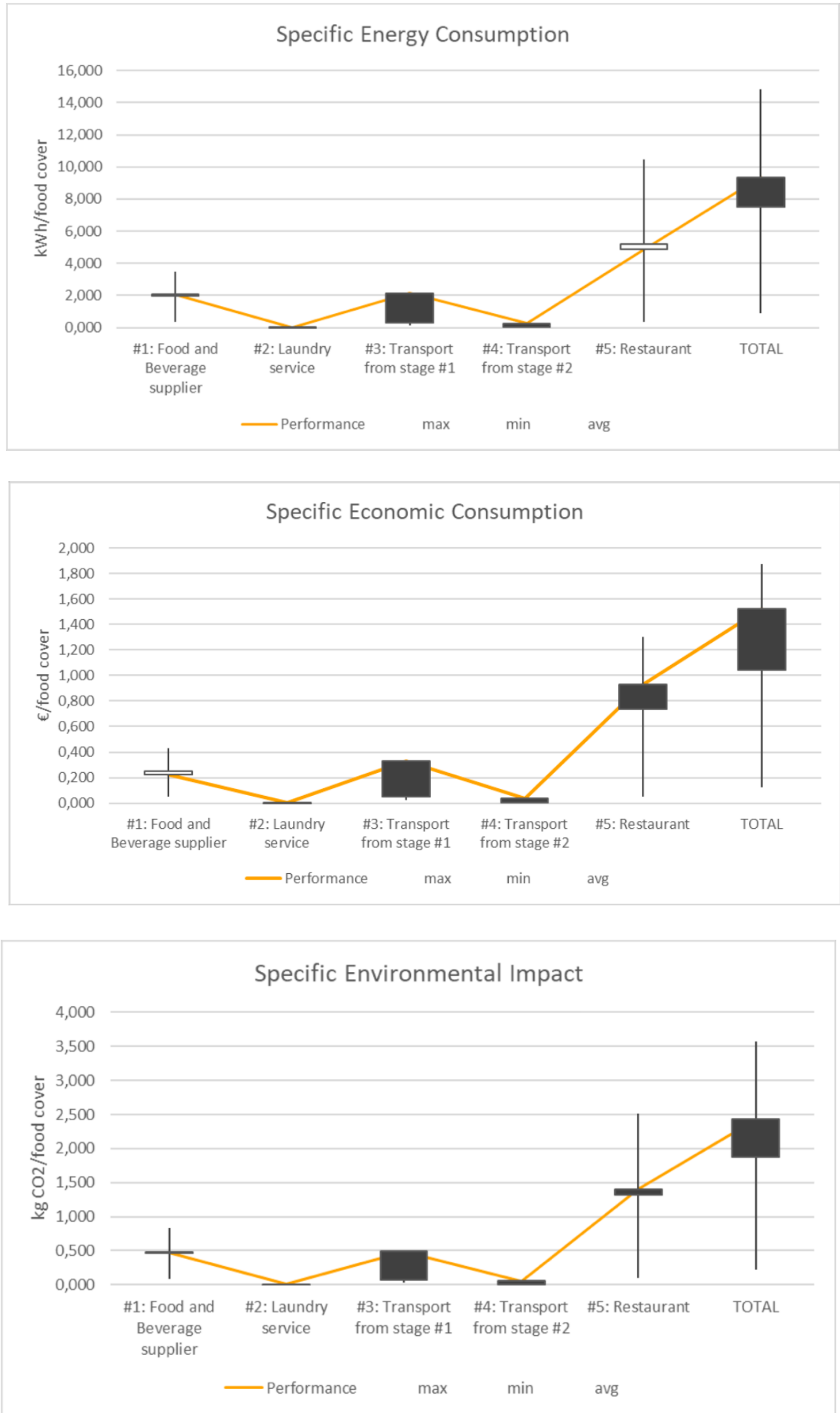


Figure 4. Benchmarking performance of the restaurant value chain

Figure 4 shows that only the restaurant aligns with the benchmarking levels of the HORECA value chain. All other activities necessitate energy efficiency interventions. As previously noted and reinforced by the benchmarking analysis, the transportation of food from the supplier to the restaurant represents the most problematic area. The food supplier is the sole entity meeting the average benchmarking levels for cost per cover. While none of the activities comply with the average CO_2 emission limits per cover. Food transportation exhibits a specific energy consumption that exceeds average benchmarking values by 1.87 kWh/food cover. Additionally, the specific economic consumption is 0.28 €/food cover higher than the average benchmarking level, and the specific environmental consumption surpasses average benchmarking levels by 0.42 kg CO2/food cover. These findings underscore the need for priority energy efficiency improvements in transportation. Regarding other activities within the value chain, no energy efficiency measures are deemed necessary for the food supplier, as its specific energy consumption exceeds average benchmarking levels by only 0.085 kWh/food cover. While the laundry's performances are slightly above average benchmarking levels. However, transportation from the laundry to the restaurant requires interventions to improve energy efficiency, particularly to reduce the specific energy consumption, which exceeds average benchmarking levels by 0.23 kWh/food cover. Although the restaurant's specific energy consumption is -0.35 kWh/food cover, indicating excellent performance compared to average benchmarking levels, energy efficiency measures are still recommended due to the high consumption from HVAC systems. In conclusion, the recommended energy efficiency measures include: 1. Reducing the number of trips made by the transportation company to deliver food from the supplier to the restaurant. 2. Reducing the number of trips to transport linens from the laundry service to the restaurant. 3. Replacing the HVAC systems in the restaurant.

Catering service value chain

The catering company, based in France, specializes in event services. The central kitchen prepares 32,900 kg/year of food, supplying 25,000 food covers to events. The company offers food at ambient temperature (700 kg/year), hot (12,200 kg/year), and fresh (20,000 kg/year) to cater to diverse customer needs. The central kitchen consumes approximately 51,420 kWh of electricity for processing food and for the in-house laundry service. For company-catered events, the consumption rises to 25,000 kWh of electricity, and 12,500 m^3 of gas per year. Figure 5 illustrates the energy consumption of the catering value chain expressed in kWh/food cover.

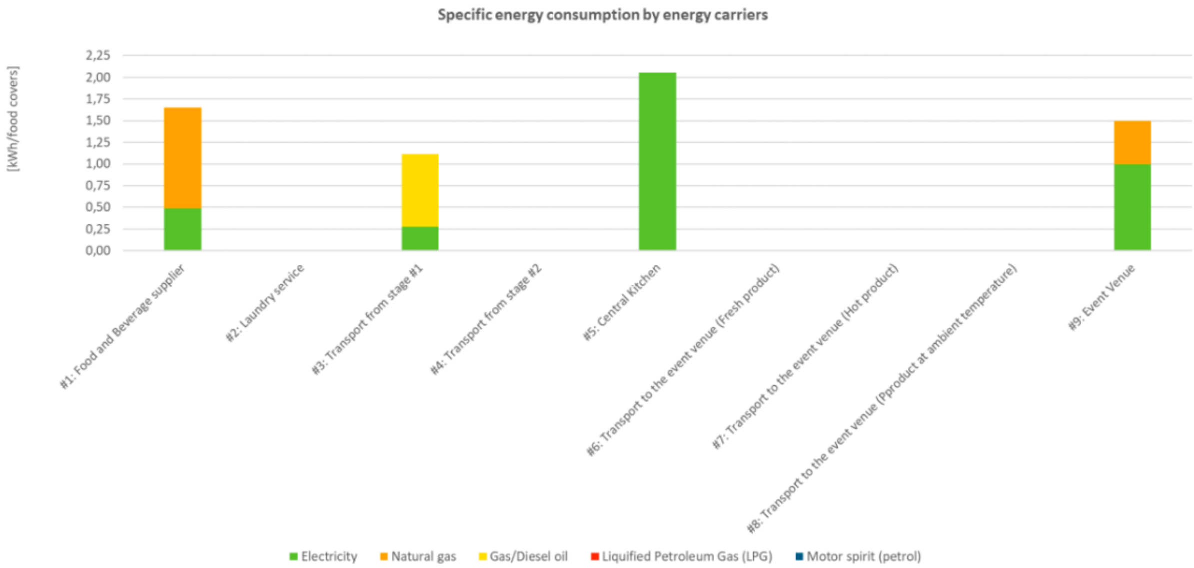
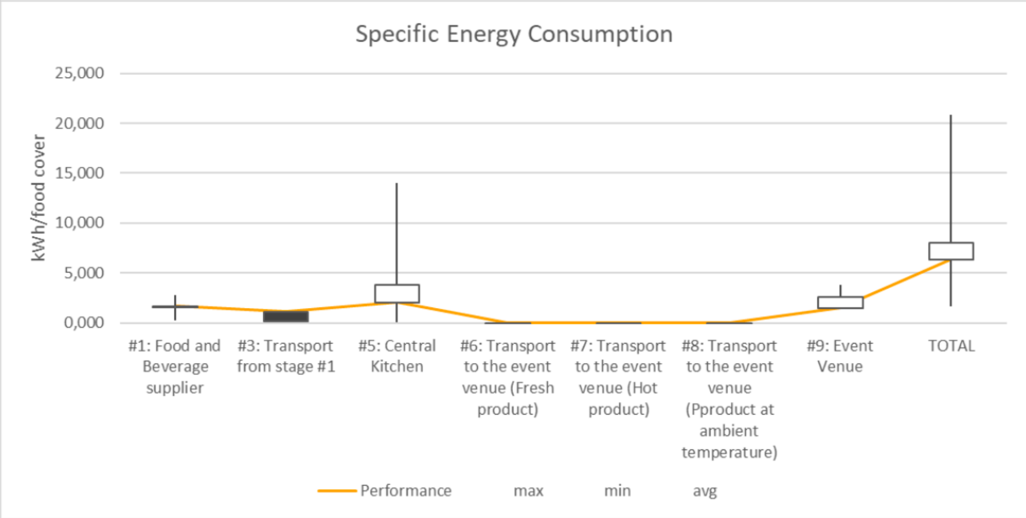
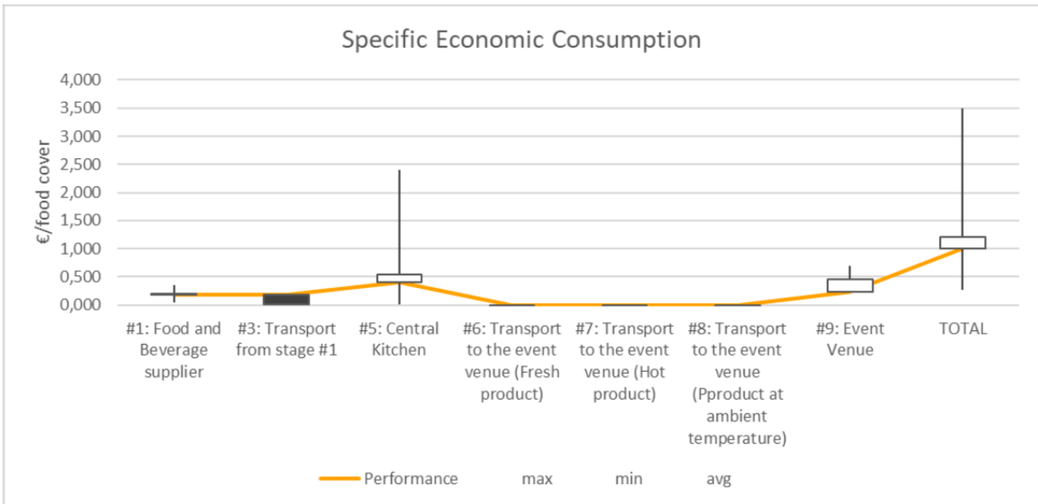


Figure 5. Specific energy consumption per activity and energy carrier of the catering service value chain

The central kitchen procures 18,000 kg of fresh food annually, 10,000 kg of frozen food, and 5,000 kg of ambient temperature food from strategic suppliers. As illustrated in Figure 5, the central kitchen exhibits the highest energy consumption, with a specific energy consumption of 2.06 kWh/food cover. The central kitchen's consumption is exclusively electrical, as natural gas is not used for food preparation. This suggests that energy efficiency measures have already been implemented. The internal laundry's energy consumption is included within the total energy consumption of the central kitchen, resulting in zero energy consumption for the external laundry service provider and its transportation to the central kitchen. The graph also reveals the food supplier's high energy consumption, with an SEC of 1.65 kWh/food cover, mainly due to natural gas consumption. The supplier may be using outdated technology, providing inadequate staff training, or neglecting necessary maintenance operations. The transportation of food from the supplier to the central kitchen consumes excessive energy, with a value of 0.84 kWh/food cover. To reduce this consumption, implementing measures such as reducing the number of delivery trips or utilizing portable refrigerated units during transportation to eliminate refrigeration-related electricity consumption could be considered. The transportation of hot, fresh, and ambient food from the central kitchen to the event has a negligible energy consumption of approximately 0.01 kWh/food cover. Figure 6 presents the benchmarking results for French catering, analyzing specific energy consumption (kWh/food cover), specific economic consumption (€/food cover), and specific environmental consumption (kg CO_2/food cover).





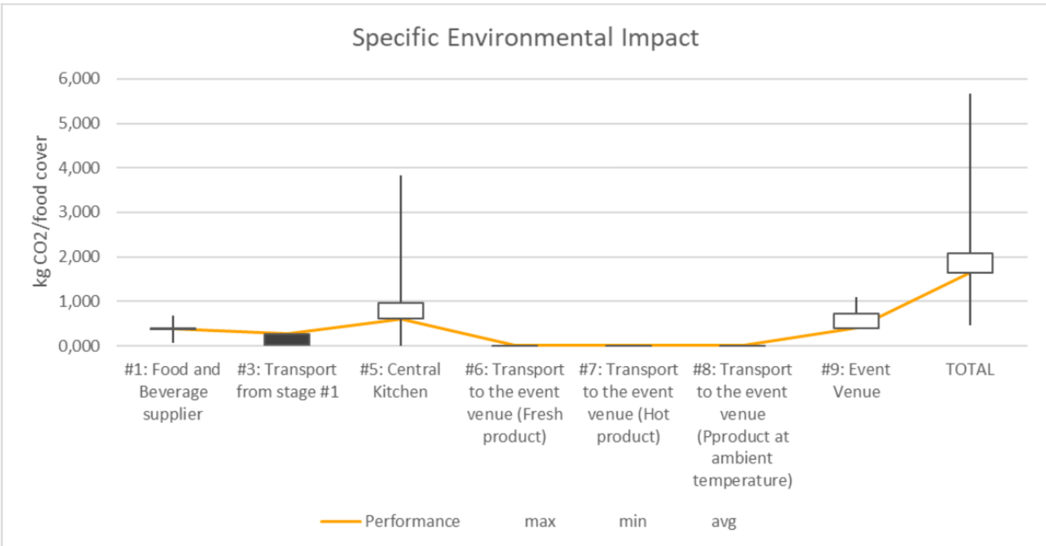


Figure 6. Benchmarking performance of the catering service value chain

The external laundry and transportation from the laundry to the central kitchen are not included in Figure 6, as the catering service maintains an in-house laundry. The graphs highlight that the central kitchen and the event venue surpass the average benchmarking levels in terms of energy efficiency. Consequently, energy efficiency measures will be implemented in the remaining activities of the French catering company's value chain. The food transportation from the supplier to the central kitchen exhibits a specific energy consumption that exceeds average benchmarking values by 1.01 kWh/food cover. Additionally, the specific economic consumption is 0.162 €/food cover higher than average benchmarking levels, and the specific environmental consumption surpasses benchmarking levels by 0.24 kg CO_2/food cover. These findings underscore the need for energy efficiency improvements in transportation from the supplier to the central kitchen. While the food supplier's specific energy consumption exceeds reference levels by 0.07 kWh/food cover, economic and environmental consumption align with reference levels, with respective values of -0.025 €/food cover and -0.008 kg CO_2/food cover. Therefore, implementing an energy efficiency measure such as maintenance and staff training is recommended. The transportation of food from the central kitchen to the event location is nearly aligned with average benchmarking levels. In conclusion, the recommended energy efficiency measures include: 1. Reducing the number of trips made by the transportation company from the supplier to the central kitchen and replacing the diesel vehicle with an electric vehicle. 2. Utilizing portable refrigerated units during transportation from the supplier to the central kitchen and from the central kitchen to the event venue. 3. Ensuring adequate maintenance by the supplier.

DISCUSSION AND CONCLUSIONS

This report presents a benchmarking data analysis for the HORECA sector, focusing on hotels, restaurants, and catering services value chains. The study aims to identify reference data for the different activities of the value chains and to define a procedure for identifying and prioritizing opportunities for energy efficiency improvements.

The Ho.Re.Ca. businesses are increasingly recognizing the value of internal performance monitoring for benchmarking purposes. This practice fosters continuous improvement by enabling businesses to identify areas of energy consumption optimization. However, the lack of widespread smart meter implementation presents a significant obstacle in accurately assessing the impact of various energy usage patterns. This absence of granular data creates several key challenges:

- Limited Data Availability: Traditional metering systems often only provide an aggregate annual energy consumption figure. This limited data fails to capture the intricacies of energy usage throughout the day or across different areas of the business. Understanding the temporal and spatial distribution of energy consumption is crucial for targeted efficiency improvements.
- Seasonal Variations and Benchmarking Comparability: Energy consumption within the Ho.Re.Ca. industry fluctuates with the seasons. Without detailed data on this temporal variability, it becomes difficult to conduct meaningful comparisons between performance periods. This hinders the effectiveness of benchmarking initiatives as seasonal influences cannot be effectively isolated.
- Resource and Time Constraints: Implementing effective internal benchmarking requires dedicated resources and sustained time commitment. Many Ho.Re.Ca. businesses operate in a fast-paced environment with tight margins, which may limit their capacity to invest in extensive data collection and analysis processes.

While internal benchmarking remains a crucial first step, true optimization may ultimately require external comparisons. However, current industry trends suggest that companies are not yet fully prepared for full-fledged external benchmarking:

- Focus on Internal Validation: Businesses are currently prioritizing the validation and refinement of their internal benchmarking practices before venturing into external comparisons. Establishing a robust and reliable foundation for their own data collection and analysis is essential before seeking insights from external sources.
- Best Practices: When it comes to external benchmarking, comparisons with industry leaders' best practices seem to offer the most promising path forward. This approach provides valuable insights into successful energy-saving strategies without the complexities of a full value chain analysis. Businesses can learn valuable lessons from industry leaders and implement these best practices to optimize their own operations.

- Value Chain Benchmarking: Benchmarking across the entire Ho.Re.Ca. value chain presents significant hurdles. Obtaining data and information from suppliers can be hampered by privacy concerns and the lack of established collaboration within the industry. For example, analyzing the energy footprint of a farm-to-table restaurant becomes a challenge if upstream suppliers are not willing to share their data.

Given these complexities, current strategies may prioritize providing resources like:

- Catalogues of Best Practices: Sharing documented examples of successful energy-saving strategies within the Ho.Re.Ca. sector allows businesses to identify and implement proven approaches tailored to their specific needs.
- Supplier Evaluation Frameworks: Establishing frameworks for assessing potential suppliers based on environmental certifications or sustainability practices can provide valuable insights into their energy efficiency commitment. This allows businesses to make informed decisions about their supply chains and potentially influence positive change within the industry.

Benchmarking was conducted by collecting primary data from various HORECA businesses through questionnaires and secondary data from existing reports. The specific energy consumption (SEC) metric was used to assess energy efficiency, with different units of measurement for hotels (kWh/guest night) and restaurants/catering (kWh/food cover). Key findings of the energy performance benchmarking are:

- Hotels: High-end hotels with extensive services have higher energy consumption. Factors such as hotel size, energy system efficiency, and district heating usage also influence consumption.
- Restaurants: Energy consumption varies based on factors like size, location, and service offerings. Outdated equipment can contribute to higher consumption.
- Catering Services: Energy consumption varies based on the size and type of events catered. Smaller catering services often rely solely on electricity, which is sufficient for their operational needs. Larger catering services, catering to larger events with more extensive menus and food preparation requirements, may utilize both electricity and natural gas to meet the increased energy demands.
- Transportation: Transportation of food and beverages can have a significant impact on energy consumption, particularly for refrigerated items.
- Food and beverage suppliers: Key factors influencing energy consumption are the product type (e.g., meat, dairy, beverages), production processes and activities provided (e.g., processing, packaging, logistics), equipment efficiency (e.g., refrigeration, heating), and energy management practices.
- Laundry service provider: Key factors influencing energy consumption are the laundry type (e.g., commercial, industrial), equipment efficiency (e.g., washing machines, dryers), water usage and efficiency, laundry load size and frequency.
- Other Factors: Factors like HVAC systems, lighting, and staff training can also influence energy consumption.

The report presents three case studies demonstrating the application of benchmarking data and the procedure proposed: a four-star Latvian hotel value chain experiencing high energy consumption due to extensive services and outdated laundry equipment, a medium-sized Spanish restaurant value chain facing elevated energy consumption from HVAC systems and outdated equipment at the restaurant, as well as inefficient transportation logistics, and a French catering company value chain experiencing high energy consumption in the central kitchen and due to inefficient transportation practices from suppliers.

Benchmarking is a valuable tool for HORECA businesses to identify opportunities for energy efficiency improvements, reduce costs, and enhance overall performance. The case studies demonstrate the practical application of benchmarking data in identifying specific areas for intervention.

Benchmarking is not only about identifying areas for improvement but also about prioritizing interventions based on their potential impact. While activities with the highest energy consumption might seem like obvious targets, benchmarking can reveal that some activities with relatively lower consumption may be far from their best practices. Key considerations for prioritization are:

- Relative performance gap: Identify activities that are significantly below industry benchmarks.
- Cost-effectiveness: Assess the potential cost savings and payback period for different interventions.
- Feasibility: Consider the technical and operational feasibility of implementing various measures.
- Alignment with overall energy strategy: Ensure that interventions align with the organization's broader energy goals.

Additional considerations for efficient benchmarking are ensuring accurate and reliable data collection for effective benchmarking, carefully selecting benchmarking partners for meaningful comparisons, fostering a culture of continuous improvement based on benchmarking insights, and considering external factors like economic conditions and regulatory changes that may impact energy consumption.