

# SUSTAINABLE CLEANING PRACTICES

FOR THE PROTECTION OF WATER RESOURCES  
IN THE TOURISM INDUSTRY



## #BlueLaundries



Horizon



PARTNERS



Protection  
of Nature  
HELLENIC SOCIETY FOR THE PROTECTION OF NATURE



Green Key



GREEN FUND

FUNDING

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# #BlueLaundries

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# Greek Tourism - Enhancing Resilience against Climate Change Challenges

The Greek tourism industry is a strong pillar of the country's economy, generating revenues exceeding €19.5 billion, thus directly affecting 11.50% of the country's GDP. The indirect contribution of tourism is estimated to be between 25.30% and 30.50%. With over 10,000 hotels and more than 27,000 rental rooms, tourism businesses provide the first travel choice for hundreds of thousands of visitors from around the world, who appreciate the services and the experience offered by the natural environment of Greece.

The cleaning industry, both bulk and retail, is closely linked to the activities of tourism businesses in Greece. According to the latest available data, there are over 4,000 active businesses in this sector, which contribute around 0.15% to Greece's GDP. The rapid growth of tourism has led to a surge in the demand for vital resources like water and energy, forcing businesses to consume them in larger quantities to cater to the increasing needs of the expanding tourist population.

Specifically, hotel guests in tourist areas consume significantly more water per person compared to permanent

residents. In fact, the average daily water consumption per guest in a 5-star hotel can reach as high as 440 liters. Notably, the water consumption per guest not only includes personal use, but also encompasses services and amenities that enhance the guest experience. This highlights the direct correlation between rising water demands and corresponding energy requirements.

In addition, the Tourism Carrying Capacity (TCC) and related metrics, including the Tourism Density Index (TDI) and Tolerable Tourism Population Index (TTPI), indicate that many regions in Greece are overwhelmed by tourist arrivals during peak seasons, with visitor numbers often exceeding those of permanent residents. In fact, water usage generated by tourism in popular destinations accounts for a significant 56% of the region's overall annual consumption.

Given the upward trend in energy costs and the pressing concerns of climate change, it is crucial to implement strategies that fortify Greece's tourism sector against climate-related disruptions, ensuring its long-term viability.

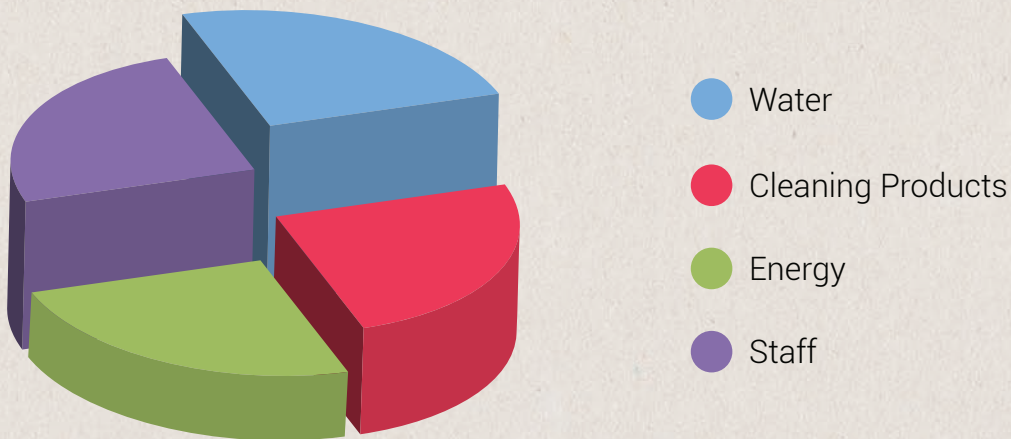


# Water and Energy Challenges from Laundry Services

Part of the operational costs of tourism businesses are the costs associated with laundry services, including water, energy, and cleaning products. These substantial demands for cleaning products, water, and energy result in increased operational costs. Characteristically, the estimated quantities of the required cleaning products can reach up to 50 liters per day for a small hotel unit, while a full laundry cycle consumes around 200 liters of water leading to uncontrollable consumption management. Considering that the total

water consumption of a hotel guest is up to 2.5 times higher than their household consumption, it becomes immediately clear that water flow management can significantly contribute to reducing the corresponding operational expenses of a business. At the international level, the rapid increase in energy prices has led to an increase in the cost of laundry services, while the pressures on available water resources makes it increasingly necessary for more efficient and sustainable laundry practices.

## COST PER WASH CYCLE



**Image 1.** Cost per wash cycle



The efficiency of laundry services in a hospitality business accounts for approximately 30% of the company's overall environmental footprint. The increased environmental footprint is directly linked to unnecessary consumption of electricity, water, and consumables, as well as operational costs. Moreover, it is estimated that at least 60% of hospitality businesses in Greece do not declare whether they treat wastewater, while at least 50% are unaware of the amount of wastewater generated after each laundry cycle. During peak demand, up to 50% of hotel units may perform up to 12 laundry cycles per day. Also, it is estimated that at least 55% of businesses with biological wastewater treatment systems do not know which chemicals are not suitable for their system, which raises concerns about the potential impact on processing and the level of treatment before they reach the natural environment

Laundry wastewater (LWW) is produced from each cycle and typically includes a mixture of detergents and specialized cleaning products (bleach, fabric softeners, solvents, etc.), as well as elements related to the laundry content, such as threads, microplastics, dyes, dye residues, and other substances. These wastewaters can directly enter the environment due to failures in water infrastructure, while others are channeled into sewage systems and biological treatment plants. However, the degree of processing before they reach the environment is unclear and uncertain, as various factors such as

proper system operation, specifications, and chemical composition influence the overall processing performance.

There are various parameters in evaluating laundry wastewaters. These parameters include the temperature, pH, suspended/dissolved substances (e.g., suspended solids, dissolved organic compounds), chlorine (Cl<sub>2</sub>), sediments (e.g., suspended solids, particulate matter), Total nitrogen (TN), Total phosphorus (TP), Ammonia nitrogen (NH<sub>3</sub>-N or NH<sub>4</sub>-N), Chemical Oxygen Demand (COD), Biochemical Oxygen Demand (BOD<sub>5</sub>) - 5-day BOD and Anionic surface-active agents (surfactants). Researchers have reported that laundry wastewaters can have toxic properties that can cause negative environmental impacts, such as water pollution and eutrophication with direct or indirect effects on public health. Some common components of detergents include surface-active agents, active whitening agents, and other additives; however, the production of wastewaters and their chemical composition can vary depending on the laundry technology and applied practices. In summary, laundry services use water as one of their main input elements and release significant amounts of pollutants with potential environmental impacts that are often not adequately treated. Implementing sustainable cleaning practices in the hospitality industry can have a substantial impact on reducing water and energy consumption, thereby contributing to a more environmentally friendly and cost-effective approach.



# The Importance of Implementing Environmental Management Systems

The hospitality sector has undergone a transformation in recent years, driven by the adoption of Environmental Management Systems (EMS) like the ISO 14001, the Eco-Management and Audit Scheme (EMAS), the «Green Key» label, and the EU Ecolabel, which enable hotels to monitor and reduce their environmental footprint. In Greece, it is estimated that the implementation of EMS in hospitality businesses significantly affects the levels of awareness and consciousness of these businesses. Specifically, the recent pilot study within the #BlueLaundries project concluded that hotels with an Environmental Management System (EMS) were significantly more likely to provide environmental training for their

staff, with 90% of such establishments conducting regular training seminars. In contrast, only 37% of businesses without an EMS and just 8% of bulk laundry companies in the country reported providing such training. Furthermore, it is estimated that companies in the cleaning and hospitality industries often lack understanding or clarity on concepts such as next-generation detergents, circular practices for improving eco-efficiency, and sustainable products with reduced environmental impact throughout their lifecycle. Notably, businesses that adopt Environmental Management Systems (EMS) tend to be more knowledgeable about these concepts compared to others.





## CONSEQUENTLY, THERE IS A PRESSING NEED FOR:

- Widespread promotion of Environmental Management Systems (EMS) adoption in the hospitality sector, with a focus on encouraging more businesses to implement these systems.
- Developing and providing targeted training programs for hospitality staff responsible for cleaning, either internally or through partnerships with professional services. These programs should focus on improving laundry efficiency, reducing resource consumption, and minimizing environmental impact.
- Designing specialized training programs for industrial laundries to equip them with EMS knowledge, enabling them to better serve hospitality businesses and address challenges like circular practices, water footprint assessment, and process modernization.

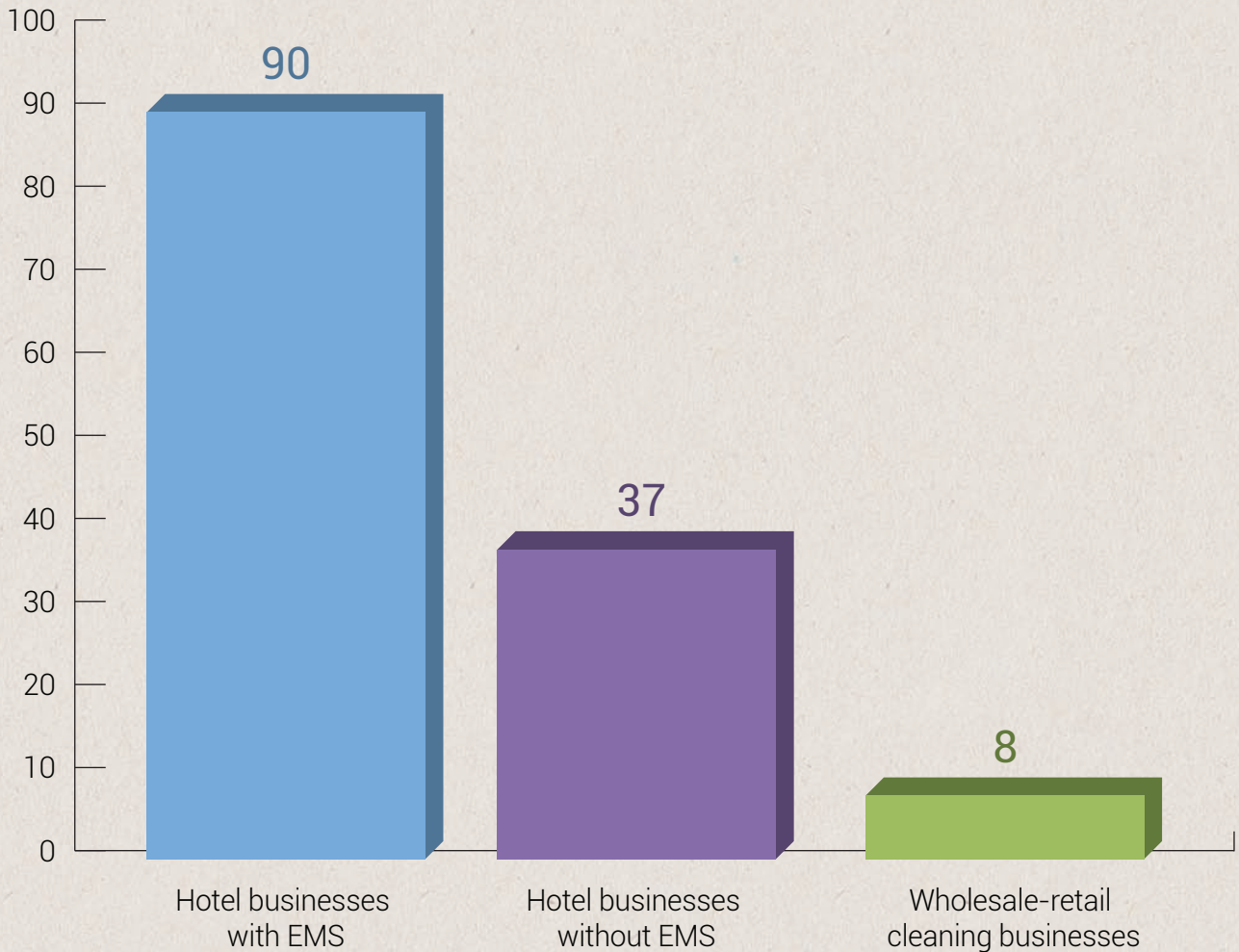
It is essential to emphasize at this point the importance of fostering robust social dialogue and cooperation between industries, particularly between the hospitality sector and professional cleaning services, as a vital foundation for advancing environmental sustainability

in the laundry industry. By collaborating across sectors, businesses can leverage each other's expertise to streamline operations, reduce costs, and enhance the quality of services provided, ultimately achieving greater energy efficiency and minimizing environmental footprint.





## IMPLEMENTATION OF TRAINING SEMINARS FOR ENVIRONMENTAL ISSUES (%)



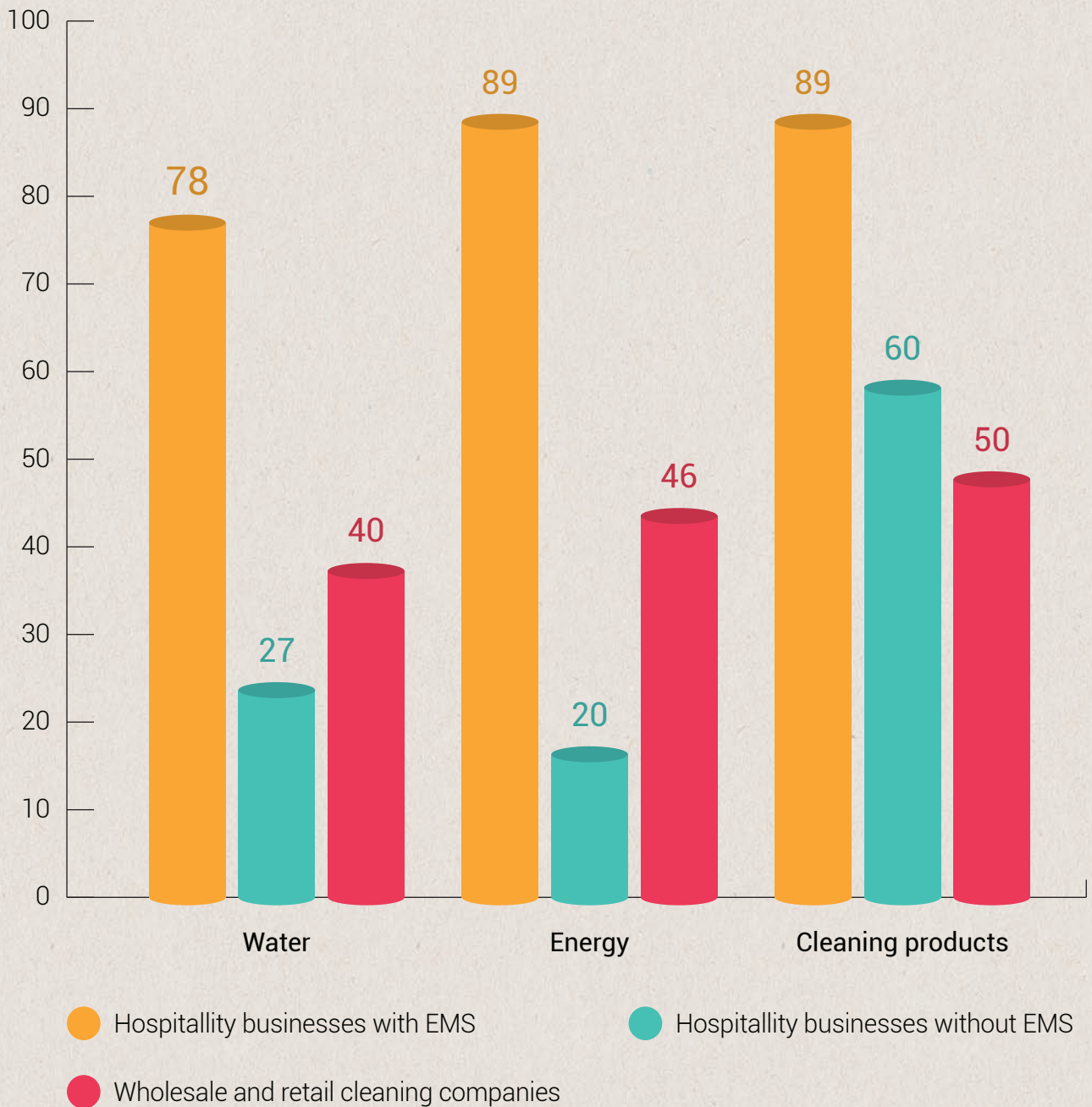
**Image 2:** Environmental Training for Hospitality Businesses and Wholesale-Retail Cleaning Services: Outcomes from the #BlueLaundries Project

Regarding the recording of resources, a pilot study conducted through the #BlueLaundries project revealed that hospitality businesses with an EMS implement a system for monitoring and recording water consumption, energy consumption, and quantity of cleaning products at a rate above 75%. In contrast, for businesses without an EMS, the corresponding rate is below 30%, while 60% of them only

monitor the consumption of disposable cleaning products. Similarly, according to estimates, approximately 40% of cleaning companies employ some form of water consumption monitoring and recording, while 46% track and monitor energy consumption. Additionally, 50% of these companies have implemented measures to monitor and record the quantity of disposables used.



## MONITORING AND RECORDING OF RESOURCES (%)



**Image 3:** Monitoring and recording of water, energy, and cleaning products resources  
- Hospitality businesses and wholesale-retail cleaning services  
- Study results within the #BlueLaundries project



It seems that companies that have established an EMS tend to have higher rates of monitoring and tracking resource consumption, whereas hospitality businesses without an EMS typically exhibit lower levels of monitoring and tracking for energy and water usage. Moreover, cleaning companies tend to have higher rates of monitoring for water and energy consumption compared to hospitality businesses without an Environmental Management System (EMS). Meanwhile, businesses without an EMS appear to monitor their usage of cleaning products. It is estimated that this behavior may be attributed to the increased costs associated with these businesses. Furthermore, it is suggested that businesses without an EMS may lack the necessary tools and methods to accurately record resource consumption, which could lead to delayed detection of unnecessary waste or issues like water and energy leaks, resulting in additional expenses. As a result, these businesses may incur unnecessary financial burdens, which could be avoided through investments in monitoring systems capable of yielding cost savings within a short timeframe. Beyond the immediate financial consequences, the inability to conduct adequate monitoring can have significant consequences for the environmental footprint of the business.

Increased resource consumption, such as energy, means higher CO2 emissions, higher water footprint, and increased water footprint.

By recognizing the importance of monitoring energy, water, and consumable resource consumption, businesses can leverage a vital process that enables them to track and optimize their resource usage, ultimately driving sustainable practices and economic sustainability. The implementation of recognized Environmental Management Systems (EMS) has been found to bolster the environmental stewardship efforts of hospitality businesses, which increasingly understand that their operations must be closely tied to outstanding environmental performance. As such, the adoption of an EMS serves as a strategic tool for driving significant improvements in their environmental impact. A hallmark of these systems is the relentless pursuit of continuous improvement for participating businesses, fostering environmental excellence through the implementation of business practices that adhere to established protocols. Without an Environmental Management System (EMS), companies may struggle to drive sustainable growth, as they may lack the structure and guidance needed to optimize their environmental performance.

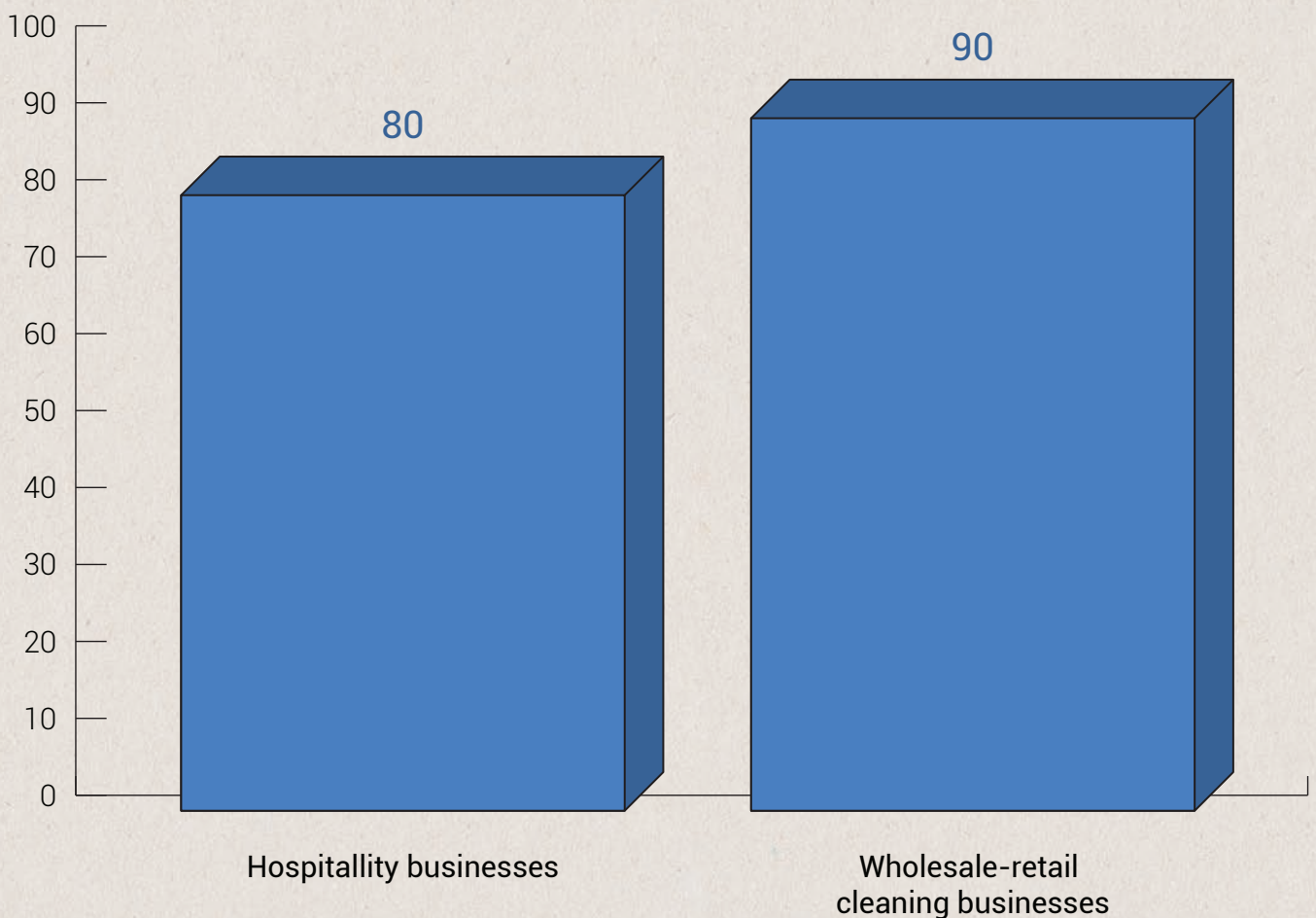


# Water usage and conservation through Circular Technologies

According to the #BlueLaundries study, the majority of hospitality and cleaning services companies (80% and 90% respectively) rely heavily on municipal water supplies, with

alternative options such as geothermal wells, rainwater harvesting tanks, and filtration-based water recycling systems being relatively less prevalent.

**LOCAL WATER SUPPLY SYSTEM (%)**



**Image 4:** Local water supply system - Hospitality businesses and wholesale-retail cleaning services - Study results within the #BlueLaundries project



Hotels of varying star ratings require a significant amount of water, with the minimum daily allocation per person ranging from 150 liters to 450 liters. This includes an additional 30 liters per person per night for laundry services alone. Consequently, large quantities of potable water are wasted on activities that could be served by alternative methods. For instance, rainwater harvesting, greywater reuse, and recycled water from laundry services could be used for tasks such as cleaning public areas, toilet flushing, irrigation of gardens and lawns, and other purposes.

The hospitality industry's transition to a more sustainable model relies heavily on increasing awareness of circular water management practices and technologies.

**This is crucial for reducing its water footprint, with immediate benefits including:**

- Reduced pressure on water supply networks and sewage systems, especially during peak tourist seasons in Greece, which often overwhelm infrastructure in popular destinations.
- Conservation of potable water, a finite natural resource, by adopting circular practices that optimize water usage for purposes aligned with its inherent characteristics, thereby promoting rational management and minimizing waste.



Rainwater harvesting and utilization, coupled with suitable filtration systems, represents a clever circular strategy. In regions where tap water exhibits high hardness levels, this approach is particularly effective in prolonging the lifespan and durability of laundry equipment by reducing mineral buildup and wear and tear.

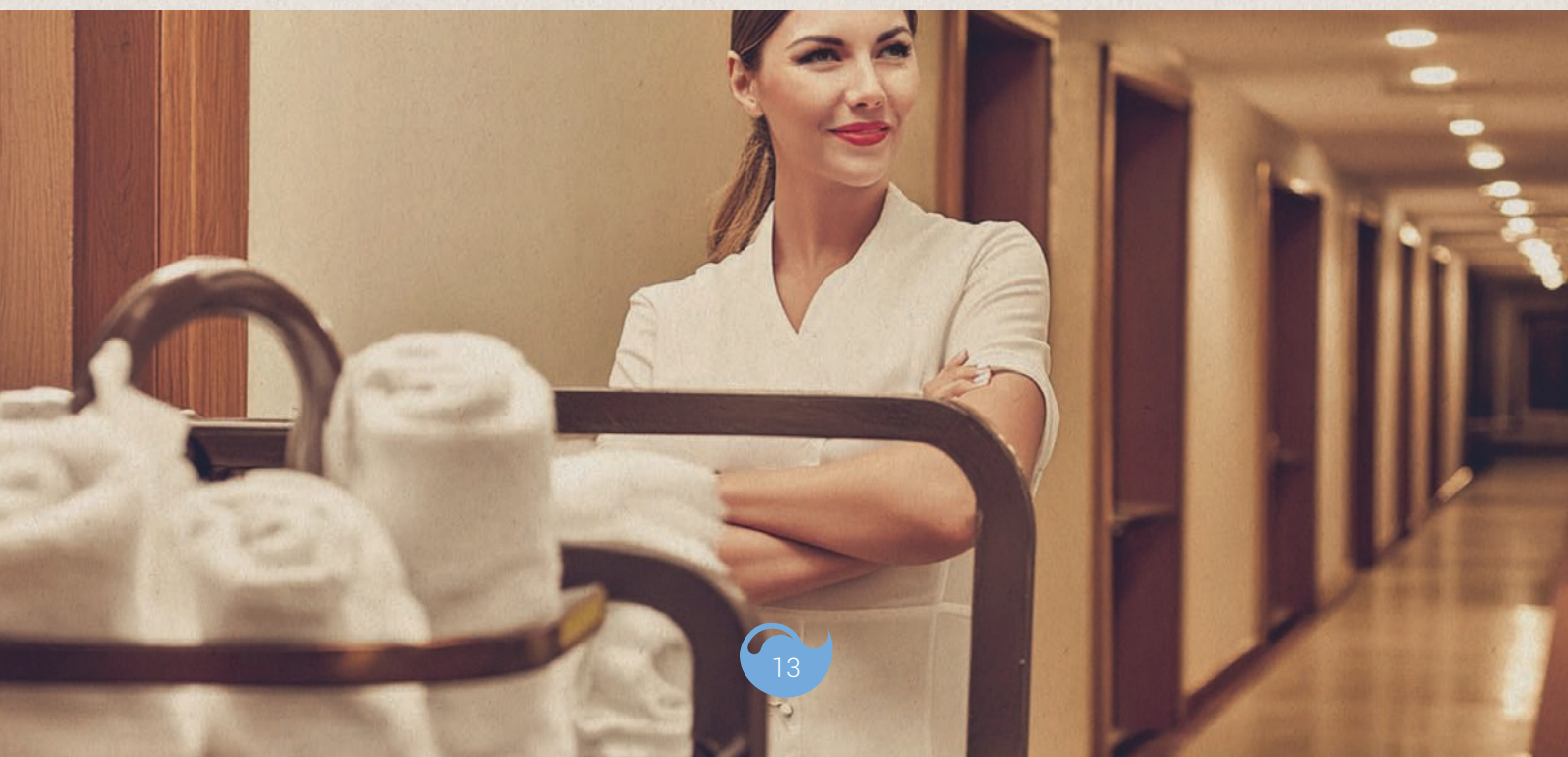


Given the interconnectedness of water and energy consumption (water-energy nexus), it's estimated that 17% of a hotel's total energy usage is dedicated to water heating, with a substantial portion allocated solely for laundry purposes. This highlights the importance

of implementing best practices for water and energy management and optimization, as well as conducting market research on professional cleaning services. By doing so, businesses can reduce their operational costs associated with these consumptions.



The energy consumption of commercial laundry facilities is significantly lower than that of household washing machines with higher energy classes. A basic difference is that commercial laundries have a hot water inlet that can come from the use of renewable energy sources (e.g. solar). On the other hand, household-type washing machines heat the wash water using resistors, consuming more energy. Additionally, a household-type washing machine may need to heat a larger quantity of water than what is needed for a single washing cycle since it does not have the user's programming capability (level adjustment) to match the business's needs.





# Cleaning Products: A Key Factor in Laundry Performance

The introduction of next-generation cleaning products is revolutionizing the way businesses operate, enabling them to clean more sustainably, with less harmful materials, fewer stages of washing and reduced environmental and economic impact.

A study conducted as part of the #BlueLaundries project, which investigated the role of suppliers in informing their business customers about innovative detergents designed to optimize laundry performance, has revealed that a significant proportion of companies are not receiving the information they need. Specifically, at least 50% of cleaning services companies and 65% of hospitality companies without an environmental management system (EMS) are not receiving relevant information about next-generation detergents. In contrast, a striking 80% of hospitality companies with an EMS are receiving this information. This underscores the significance of implementing an Environmental Management System (EMS) for hospitality businesses, which is closely tied to their external operations, such as the selection of disposable cleaning supplies, and has a substantial impact on their purchasing behavior.

When it comes to detergents, businesses' purchasing habits prioritize three key factors: product efficacy, the balance between price, quality and environmental responsibility, and suitability for employee use. This has led entrepreneurs in the industry to focus on delivering top-notch service quality for laundry care.

Research has consistently shown that the right choice and application of detergents have a direct correlation with reducing environmental impact. In fact, studies demonstrate that this can result in substantial energy savings of 22.5% and water savings of 25.7%. Notably, in Greece hospitality companies with an EMS are more likely to adopt eco-friendly and biodegradable cleaning products compared to those without an EMS. Laundry businesses exhibit the same level of rare usage of such products.



Having precise information from a specialized supplier is crucial. When businesses lack products customized to their requirements, they end up wasting valuable resources such as materials, energy, time, and water, which can negatively impact the environment through the release of unnecessary chemicals. Moreover, re-washing clothes contributes significantly to laundry expenses, highlighting the importance of getting it right the first time.

A consequence of the above is the unnecessary increased consumption of water, energy, and cleaning products per tourist unit, creating significant amounts of waste.

#### **WHEN SELECTING DETERGENTS:**

- Opt for products tailored to the business's specific needs, avoiding generic products that can compromise on quality, efficiency, and cost-effectiveness.
- Choose products bearing an eco-label, which indicates a reduced environmental footprint.
- Prefer products packaged in larger quantities (e.g., 20 liters, drums, or tanks) made from recycled plastic, rather than single-use plastic bottles (e.g., 2-3 liters).
- Whenever possible, select products that come in returnable or reusable packaging, aligning with sustainable practices and reducing waste.

The use of sustainable cleaning products can significantly contribute to the protection of the natural environment. A similar conclusion can be drawn for cleaning service companies, as it is estimated that 50% of them can perform up to 20 laundry cycles per day during peak season.







# Professional Cleaning Equipment

A thorough examination of the technological infrastructure for laundry care in the hospitality industry, as analyzed by the #BlueLaundries study, reveals a stark contrast between businesses with and without EMS.

Specifically, at least 60% of businesses with EMS have invested in upgrading their equipment within the past three years, whereas at least 60% of those without EMS have not updated their equipment in over three years. Furthermore, our research indicates that a significant majority of hospitality businesses, with and without an EMS, consider their equipment to be technologically up-to-date, with at least 80%

of those with EMS and 70% of those without EMS rating their equipment as modern.

Moreover, it is estimated that at least 70% of hospitality businesses with EMS have exclusively professional equipment, whereas 60% of those without an EMS have a mix of professional and domestic equipment. Notably, our findings suggest that hospitality businesses with EMS are more likely to prioritize investing in high-quality, professional-grade equipment upgrades, whereas those without EMS tend to make less frequent updates and often include household appliances in their replacement cycles.





When selecting professional washing machines for businesses, it is crucial to consider several factors to ensure the right equipment meets the demands of the operation. Key considerations include:

- **Program customization:** Unlike household machines, professional equipment allows users to tailor programs and options to suit specific laundry needs, enabling precise control over washing cycles and settings.
- **Efficiency:** Look for machines with high efficiency ratings for energy consumption, water usage, and detergent consumption to reduce operating costs and environmental impact.
- **Hot water input:** Opt for machines that don't require resistors for heating water during washing, which can reduce energy consumption and extend the lifespan of the equipment.
- **Capacity and performance:** Choose machines with higher capacities to process large volumes of laundry, reducing the number of washing cycles, working time, and increasing overall efficiency.
- **Environmental specifications:** Ensure the equipment meets stricter environmental

standards to minimize its ecological footprint.

- **Durability and resilience:** Professional equipment is designed for heavy use and built to last, with a longer lifespan and greater resilience compared to household appliances.

Hospitality businesses with limited business cycles, facing challenges in adopting sustainable practices, can accelerate their journey towards sustainability by collaborating with professional cleaning companies and exploring strategic leasing options for laundry services. By partnering with these companies, businesses can access the necessary equipment and services without the need for long-term ownership, reducing costs and increasing flexibility to adapt to market changes. This approach also promotes resource recycling, reduces waste, and contributes to minimizing carbon emissions and conserving water resources, ultimately supporting environmental sustainability.



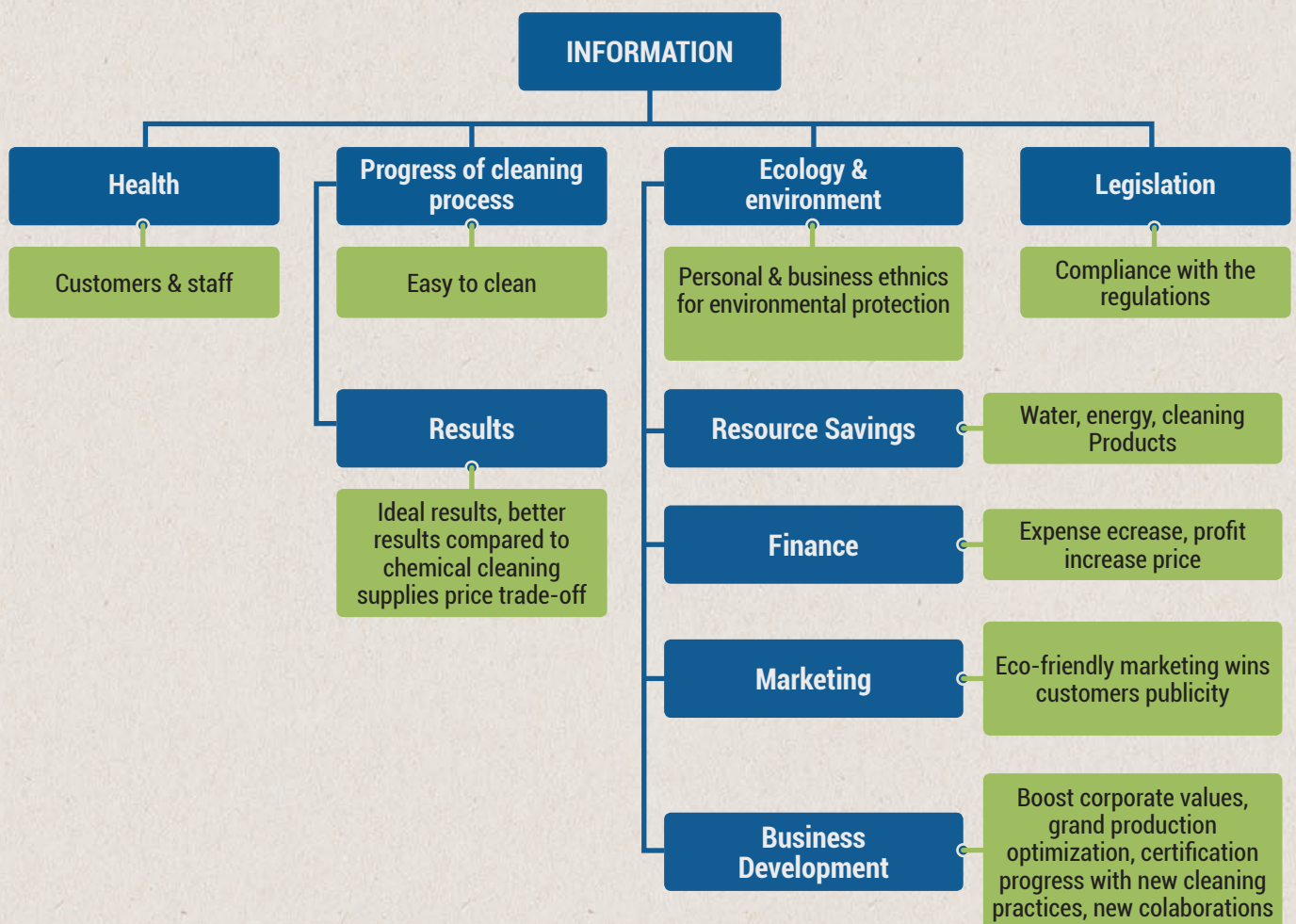


# Reducing Environmental and Economic Costs

## through Climate-Smart Laundry Practices in Hospitality: Conclusions

In the hospitality industry, where laundry demands are high, the adoption of sustainable cleaning practices is strongly driven by a range of compelling incentives. First and foremost, educating businesses about the benefits of a green transition sets the stage

for the emergence of various incentives, including those tied to health, regulatory requirements, improved processes, enhanced outcomes, environmental concerns, resource conservation, economic savings, marketing opportunities, and long-term development.



**Image 5:** Incentives and Reasons for Encouraging Eco-Friendly Cleaning Practices  
- Results of the #BlueLaundries project study



In Southern Europe, particularly in Greece, hotels can reap significant benefits by adopting sustainable laundry practices. By doing so, they can expect to conserve 25-30% of their water and energy usage. Moreover, the market indicates that businesses with a strong green profile can attract new customers, as 73% of consumers are willing to choose establishments that prioritize sustainability.

For laundry companies, embracing sustainability can lead to a broader customer base among environmentally conscious businesses and individuals. Furthermore, ongoing training enables them to explore innovative practices and technologies, such as circular economy approaches, to optimize resource conservation and accelerate their green transition.

## GOALS OF SUSTAINABLE PRACTICES



**Boosting Cleaning Efficiency**



**Reducing the Environmental Footprint of Laundry Cycles**



**Enhancing Business Operations and Strategy**



**Strengthening cross-sectoral collaboration, unbundling and specialization of services**

**Image 6:** Sustainable Practices Goals



By implementing a set of effective cleaning practices that prioritize sustainability, businesses can reduce their environmental

footprint and achieve significant cost savings - in both environmental and economic terms.

**WASH SMART  
PROTECT THE ENVIRONMENT  
#BLUELAUNDRIES**

**EQUIPMENT**

**DETERGENTS**

**ENERGY**

**WATER**

**CHOOSING PROFESSIONAL EQUIPMENT**  
by programming your washing machine yourself, you can optimize wash cycles and adjust settings to suit your specific needs.

**LONG-TERM RELIABILITY & MAINTENANCE**  
When it comes to heavy-duty use, reliability is key. It is essential to select machines that can withstand the demands of frequent use. Regular maintenance is also crucial, with annual checks by a qualified technician recommended. Additionally, using softened water - particularly in areas with hard water - can help extend the life of the equipment and reduce maintenance costs.

**NEXT-GENERATION CLEANING AGENTS**  
Cutting-edge cleaning agents are designed to provide a more efficient and sustainable washing experience reducing waste, energy consumption and environmental impact.

**WHEN CHOOSING DETERGENTS REMEMBER TO:**

- Opt for eco-labelled cleaning agents packaged in bulk (20lt) over single-use plastic bottles (2-3 lt)
- AVOID generic products that can lead to overuse, inefficiency, and increased environmental strain

The greatest cost is in repeated cleanings!

**HOT WATER INLET**  
Professional laundries have a hot water inlet that can come from the use of renewable energy sources (e.g. solar). Household-type washing machines heat the wash water using resistors, consuming more energy.

**LOWER TEMPERATURES**  
Opt for detergents that function effectively at lower temperatures, reducing energy consumption and promoting a more sustainable laundry process.

**REDUCE WASHING TIME**  
when fabrics are not heavily soiled.

**MINIMIZE CONSUMPTION**  
by programming the washing machine to low water levels, applying pre-treatment for heavily soiled items to avoid re-washing, and utilizing the maximum capacity of the machine.

**STOP USING THE PRE-WASH CYCLE**  
by choosing the right laundry detergent and optimizing your washing machine settings. By doing so, not only you will simplify your laundry routine, but you will also conserve water and energy with fewer rinse cycles.

**EMBRACING CIRCULAR PRACTICES**  
enables us to manage water consumption in a more intelligent and context-specific manner, tailored to the unique characteristics of each use.

**STAY UP-TO-DATE**  
on the latest developments and best practices regarding Environmental Management Systems.

**PARTNERING WITH PROFESSIONAL LAUNDRIES TO ACHIEVE:**

- Increased productivity and cost savings
- High quality standards
- Compliance with the highest environmental standards
- Time-efficient solutions for a streamlined operation

**ASK YOUR GUESTS**  
upon arrival if they DO NOT prefer daily laundry changes – use the special marker inside the room.

**For more details visit: //bluelaundries.horizon.org.gr/**



Strengthening social dialogue and cooperation between the hospitality industry and industrial laundry companies is a crucial foundation that can have a substantial impact on promoting environmental sustainability in laundry practices.

### **KNOWLEDGE OF THE LATEST ADVANCEMENTS IN:**

- ▶ washing methodologies and technologies,
  - ▶ innovative fabrics for hotel linens, such as sustainable and eco-friendly materials,
  - ▶ specialized detergents with cutting-edge components for optimized results,
  - ▶ professional equipment and machinery designed for efficiency and reliability,
  - ▶ environmental regulations and guidelines,
- are key components of a dynamic framework that drives continuous improvement in the efficiency of hotel laundry services, empowering businesses to optimize their operations, enhance customer satisfaction, and minimize their environmental footprint within the hospitality sector.

### **THE BENEFITS FROM COOPERATION WITH INDUSTRIAL LAUNDRIES ARE SUMMARIZED AS FOLLOWS:**

- Economic efficiency and cost reduction per unit due to scale economies in industrial laundries.
- Specialization and up-to-date information on the quality care of linen that affects customer experience due to modern professional equipment and specialized staff and practices in compliance with the latest quality assurance requirements.
- Implementation of stricter environmental standards for water consumption, energy, detergents, and waste management.
- Risk management and time-saving, transferring this to industrial laundries, so that the hospitality business can focus more on its core activities.



In the absence of an Environmental Management System (EMS), hospitality businesses can partner with industrial laundry companies to streamline their washing processes, potentially reducing energy and water consumption by addressing issues of inefficiency. Additionally, hotels with limited turnover may face greater challenges in adopting sustainable practices, such as investing in modern equipment. Collaborative partnerships with industrial laundry companies and leasing strategies can provide a solution. This approach allows businesses to access services and equipment without long-term ownership, reducing costs and enabling greater adaptability to market changes. By leveraging this approach, hospitality businesses can promote sustainability by minimizing energy and water waste, encouraging resource recycling, and preserving ecological balance.

To enhance their services, cleaning companies can develop targeted training programs that extend beyond equipment and supplies, addressing the unique needs of the hospitality sector. By embracing

circular practices and conducting water footprint assessments, these companies can spearhead the modernization of laundry services, driving operational efficiency, cost savings, and environmental stewardship.

By fostering inter-industry partnerships, companies from diverse sectors can converge their expertise to elevate the quality of their services, streamline operations, and drive eco-efficiency, ultimately reducing their environmental footprint and contributing to a more sustainable future.

Ultimately, to navigate the complexities of a rapidly changing economic landscape, it is crucial to forge a multi-stakeholder partnership between the business, public, and civil society sectors. By harmonizing policies, financial instruments, and incentives, we can create a supportive ecosystem that empowers businesses at all stages of growth and evolution to seamlessly integrate green transition strategies. This adaptive framework will enable them to thrive amidst economic and climate uncertainty, driving a sustainable future for all.



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