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An Environmentally Sustainable Healthcare Unit in Greece

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Introduction

For sustainable development, society needs sustainable health and medical care systems, which themselves must meet sustainability criteria in their operation. However, our health systems face urgent problems that call into question the sustainability of their services. On the one hand, the healthcare industry has a significant share of carbon dioxide emissions - depending on the source between 5 and 6 %, produces large amounts of waste (sometimes hazardous) and has a very high-water consumption.

Creating an environmentally sustainable healthcare unit in Greece, involves tailoring strategies to the specific environmental challenges and opportunities present in the Greek principles. Parameters that should be examined to achieve this challenge are energy efficiency, green building design, waste management, water conservation, sustainable transportation, community engagement procurement practices and health promotion.

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GRICE

7 basic sectors

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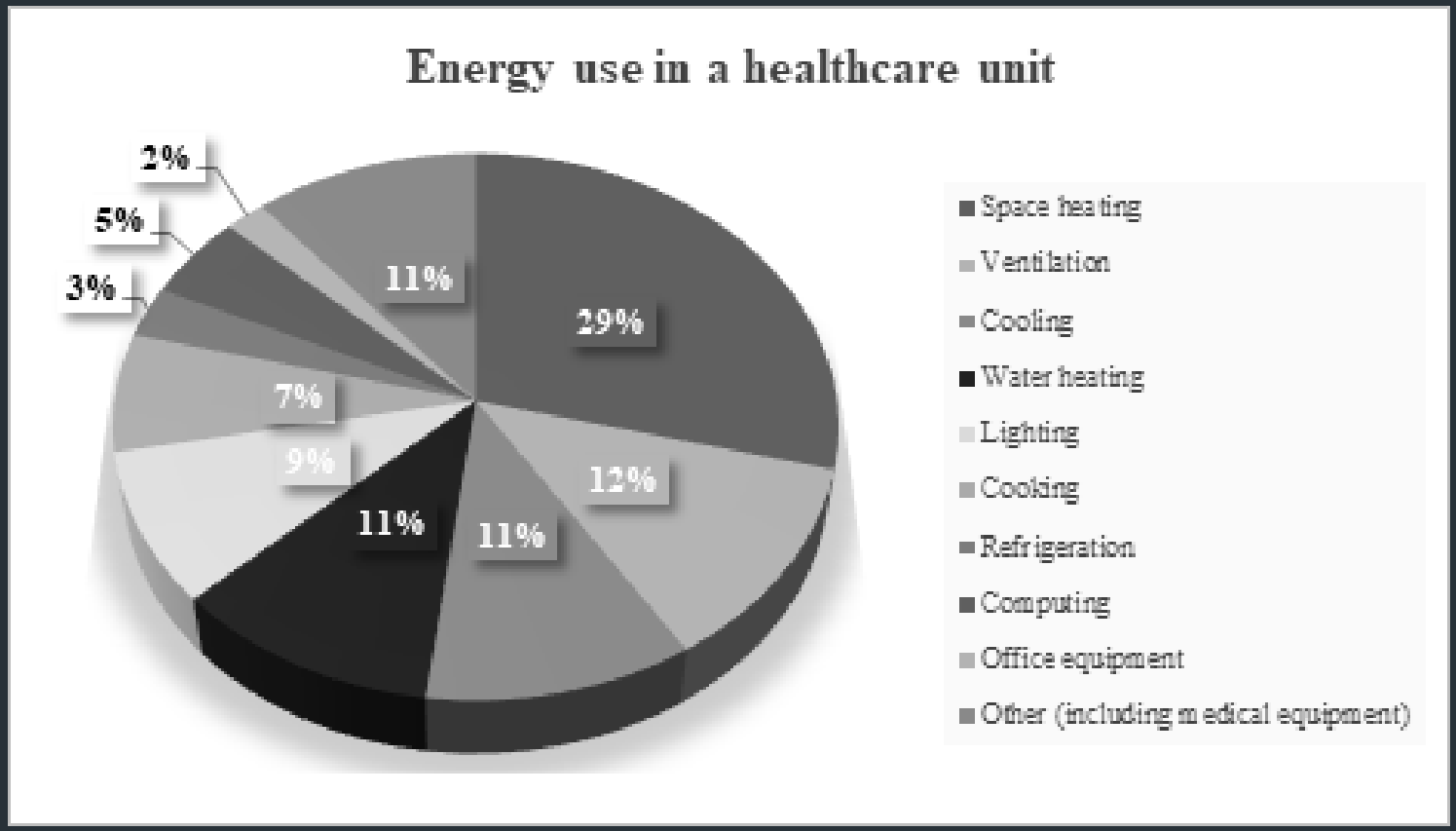
Energy efficiency



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Energy efficiency

OPTIONAL BEST PRACTICES FOR GREEK HEALTHCARE UNITS

- energy audits conduction
- building design
- lighting optimization
- equipment upgrading
- installation of enerzgy management systems
- integration of RES
- healthcare staff training
- collaboration & partnerships with stakeholders
- Building Energy Management Systems (BEMS)
- energy storage systems
- installation of intelligent lighting systems
- installation of energy efficient water systems
- energy efficient medical equipment

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Green building design

Architectural approach	Mechanical & electrical approach
Land use efficiency	Use of alternative energy
Water savings	Reduce the using of electricity power
Energy efficiency	Natural lighting
Application of the building materials used during construction	Information technology (IT)
Waste saving	
Maintenance of healthy indoor air quality	

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Green building design

While drug development is guided by evidence-based medicine, hospital design is increasingly driven by **Evidence-Based Design**, which links the physical environment with patient and staff outcomes.

Hospitals also utilize high-tech equipment that demands both skill and intellectual rigor. The "aesthetic of the hospital" addresses why hospitals are challenging to plan, build, operate, and maintain, emphasizing human comfort, well-designed spaces, and proper maintenance

Additional services, service capacity, and development are key components of a hospital's strategic plan. The hospital's business strategy is a comprehensive process that involves the entire system and its subsystems

Effective planning requires strong leadership and commitment from both the hospital and other stakeholders. This process should begin with developing systems in key areas like trauma units and medical rehabilitation

Human resources development, including skill enhancement and teamwork, is essential, along with robust financial systems that ensure accurate and timely billing information

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Waste management

According to the WHO, 15% of all medical waste is hazardous

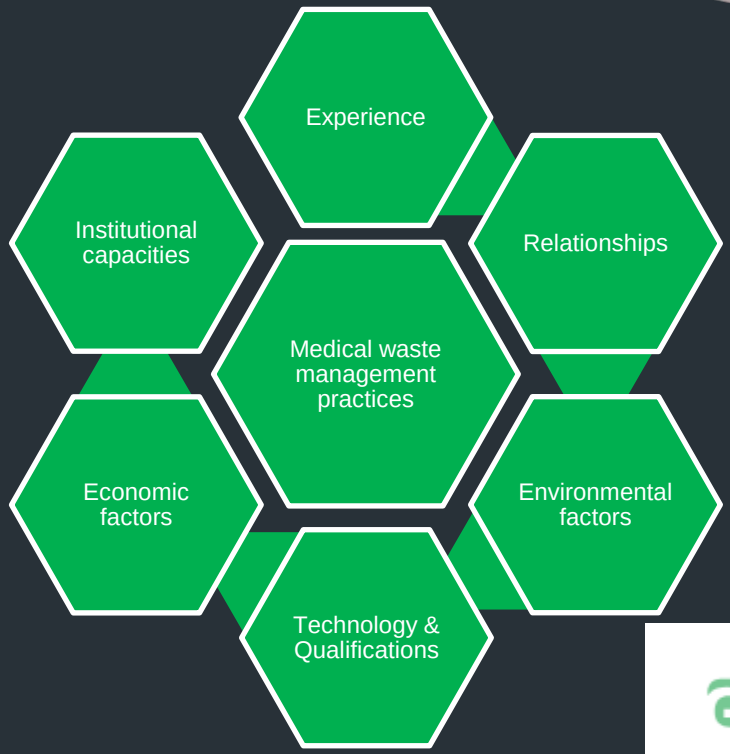
Healthcare institutions must develop comprehensive medical waste management plans (daily collection, processing, separation, and packaging of waste), along with regular monitoring and training programs

A well-designed action plan can reduce medical waste without compromising the quality of medical services

To effectively reduce medical waste in daily operations, healthcare providers need accurate data on the volume of waste they generate

Efficient medical waste management can be achieved through proper waste classification and sorting at the point of use

Several strategies for a resource recycling economy are reducing waste generation, reusing waste, promoting recycling, recovering energy and proper disposal



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Waste management

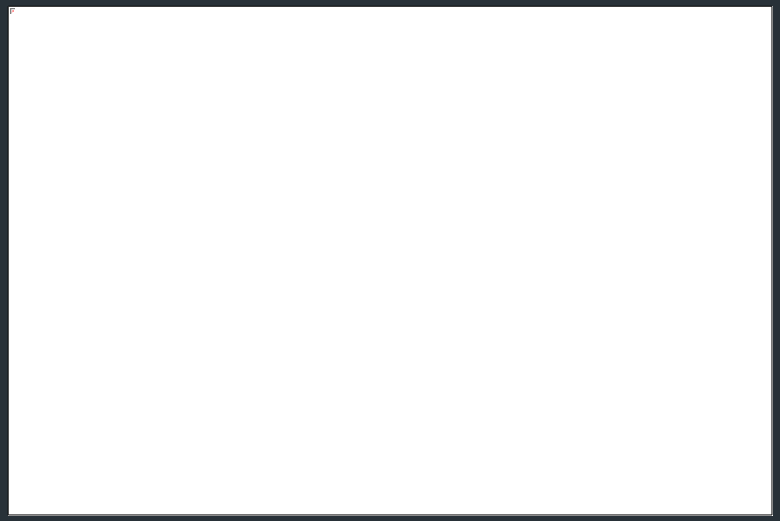
Strategies should include clear operational standards, proper waste classification, and contingency plans for disposal issues

Additionally, all members of the organization should be informed about how medical waste management impacts hospital operating costs

To address these challenges, comprehensive operational and management strategies are essential

Given that medical waste management involves social, legal, and financial aspects, authorities and associations should regularly educate healthcare workers on new regulations, research, and technologies

Hospitals should also offer training programs on the significance of environmental management for organizational efficiency and community safety



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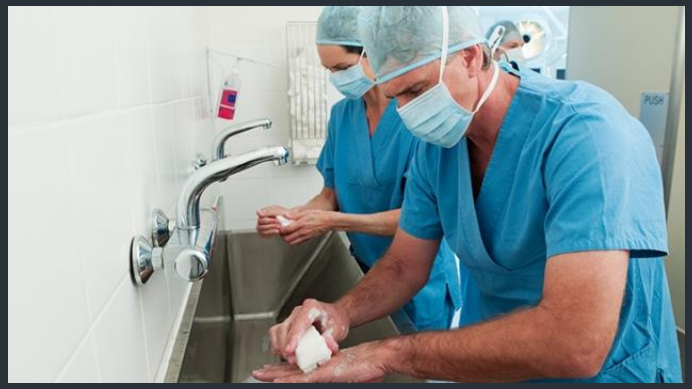
Water conservation

Hospitals require a constant supply of high-quality, hygienic water

As part of sustainability efforts, it is now essential for hospitals to implement integrated water and wastewater management systems.

The activities that require the most water consumption in hospitals, are

- washing (such as washbasins, taps, showers etc.)
- sanitation (used for water closets and toilet flush tanks)
- kitchens and cafeterias (for preparation of foods and beverages)
- processing (cleaning, sterilization, washing, heating, cooling, water filtration and softening)
- irrigation (for ornament gardens and grass)



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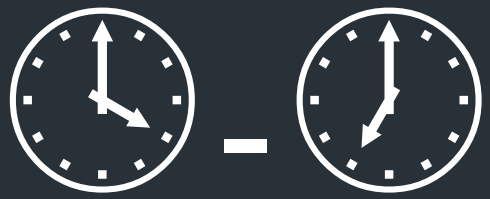
Water conservation

Water consumption in hospitals varies significantly throughout the day.

Morning peak

Afternoon peak



Key factors influencing water use include the number of beds, patient count and treatment types, hospital age, water access, available utilities, corporate management policies, and the overall environmental awareness of the facility, as well as climate, cultural, and geographical factors

A key strategy to reduce water consumption is to replace outdated equipment and fittings prone to leaks with new, efficient models

Installing appropriate fixtures in operation rooms during disinfection procedures can significantly conserve water

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Sustainable transportation

Hospitals are experiencing shortages of essential medical supplies, and companies are struggling to meet the surge in demand due to persistent supply chain disruptions from the pandemic

Even as the COVID-19 pandemic recedes, healthcare systems continue to face unprecedented challenges, especially in the supply chain involving hospitals and pharmaceutical companies

Hospitals are depleting essential medical supplies rapidly, and pharmaceutical companies are struggling to meet the surge in demand due to ongoing supply chain disruptions from the pandemic

The pandemic led to a significant reduction in the shelf life of medical items, with many falling below the 60% threshold

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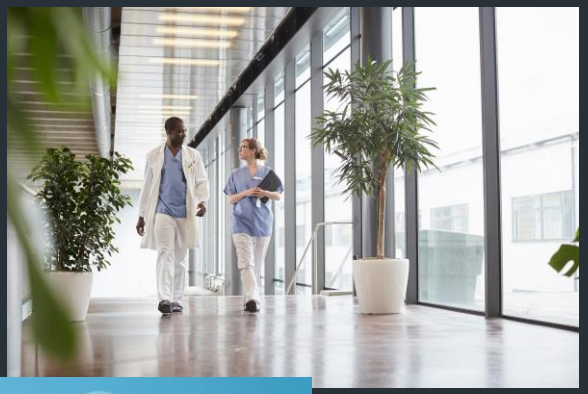
Sustainable transportation

The healthcare sector, while focused on saving lives and improving health, is responsible for nearly 5% of global greenhouse gas emissions (CO_2)

Despite being one of the sectors most affected by the COVID-19 pandemic, CO_2 emissions have begun to rise again as demand increased and the use of alternative fuels remained limited

Effective CO_2 management can be achieved through green technology, and managers must determine the appropriate investment to control CO_2 emissions

Further research provides practical insights, such as determining how much extra to pay drivers for deliveries to higher-risk areas, assessing how green technology performs within budget constraints and regulatory requirements and implementing pricing strategies alongside CO_2 reduction investments to enhance profitability for medical products



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Community engagement procurement practices

WHO estimates that one in four deaths is linked to preventable environmental causes

Dual challenge: addressing these global health threats while also reducing its own contributions to climate change

The healthcare sector is responsible for 4-5% of global carbon emissions and has a substantial impact on energy use, material demand, and hazardous waste production, which can harm air, soil, and water quality

By working with suppliers to implement reduction plans, invest in greener technologies, and adhere to green standards, healthcare providers can contribute significantly to decarbonization and enhance the sector's social impact

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Community engagement procurement practices

To implement sustainable procurement, it’s crucial to understand decision-makers' priorities, review existing sustainability targets, develop a clear roadmap, and engage stakeholders

Continuous monitoring and reporting of these practices, along with benchmarking against industry leaders, can highlight financial and reputational benefits

Key international standards and frameworks include Global Reporting Initiative (GRI), ISO 14001, ISO 26000, UN Global Compact, UN Sustainable Development Goals, OECD Guidelines for Multinational Enterprises, Science Based Targets Initiative

Health Promotion

2017, Greece spent €1,650 per capita on healthcare, over 1/3 < EU average (8.4% of GDP)

Currently, 59% of health spending is publicly funded, while out-of-pocket expenses, at 35%, are more than double the EU average.

Greece faces a pressing need to rethink its healthcare financing approach.

Re-evaluating the social values underpinning the healthcare system is essential for establishing a new paradigm for its sustainable development.

2030 Agenda for Sustainable Development Goals presents an opportunity for governments and the international community to reaffirm their commitment to enhancing health as a key component of development. WHO has proposed a framework for healthcare systems. to integrate principles, commitments, and priorities related to environmental and social policies

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Health Promotion

Several public healthcare facilities in Greece have adopted sustainable practices with notable results:

- Papageorgiou General Hospital in Thessaloniki: Reduced electricity consumption by 37%, resulting in an annual savings of €600,000.
- Sismanoglio General Hospital: Implemented upgrades including new boilers, improved network insulation, and solar water heaters. These changes have led to an estimated 30% reduction in energy use, equivalent to 2,280,000 kWh. Additionally, switching from oil to gas has cut energy costs by 20%.
- General Hospital of Alexandra: Features a pharmacy certified for quality standards, designed to be energy autonomous and eco-friendly.

A Greek hospital committed to sustainability should integrate ESG management policies throughout all its operations and services

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Conclusion

In conclusion, integrating sustainability into healthcare systems is crucial for optimizing environmental, social, and governance (ESG) outcomes while enhancing economic efficiency. Greek hospitals are increasingly adopting sustainable practices, such as energy efficiency measures and waste management improvements, to benefit both the environment and operational costs.

Effective community engagement and preventive care are key to promoting broader sustainability and public health. Policymakers and healthcare leaders should embrace sustainability as a strategic imperative, leveraging it to enhance resource management and support long-term development goals.

By fostering a holistic approach to ESG, Greek hospitals can drive positive change, ensuring a healthier future for their communities and the environment.

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Thank you for your attention!

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