Carbon footprint compensation plan for EU CONEXUS

D18/ D16.1

Final Version

WP 16 Green Campus

Contractual due date (from GA): 31st October 2025 Final delivery date*: 3rd December 2025*
WP leader: Frederick University Contributors: LRUniv, AUA, KU, UNIZD, UTCB, SETU, UROS
Dissemination level : public

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Executive summary/abstract:

This study presents a comprehensive assessment of environmental management practices across the EU-CONEXUS partner universities, conducted through a unified framework based on the ISO 14001:2015 Environmental Management System (EMS) standard. The analysis aimed to define the concept of a Green Campus within the consortium by identifying how universities integrate sustainability into governance structures, operational procedures, infrastructure, and behavioural practices. A detailed gap analysis based on an ISO-aligned methodological questionnaire revealed that all institutions already implement elements of environmental responsibility, such as recycling schemes, legal compliance mechanisms, and sustainability initiatives; however, these practices are often fragmented, informal, or insufficiently embedded within long-term EMS structures. Through systematic evaluation of environmental aspects, compliance obligations, risks and opportunities, and institutional capacities, the study established a shared EMS roadmap enabling partners to progress towards Green Campus status. Appropriate hardware was also employed as tools in the roadmap towards defining Green Campuses, as monitoring sensors were installed at all universities where live readings were used to define what benchmarks and targets each university required in order to be certified as a Green Campus

A major outcome of this work is the successful ISO 14001:2015 certification of three partner universities Frederick University, Klaipeda University, and UTCB achieved within the scope of the EU-CONEXUS initiative. These certifications validate the methodological framework developed in this deliverable and demonstrate the feasibility of structured EMS implementation in complex university environments. They also provide lighthouse models that can be replicated by other partners as they advance towards certification. Overall, the study defines Green Campuses as universities with formalised, monitored, and continuously improving environmental management systems, and establishes a consortium-wide foundation for long-term sustainability, carbon footprint reduction, and aligned environmental governance across EU-CONEXUS.

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Description:

With the eminent problem of climate change and the ever-growing demand in actions in order to promote and achieve green practices there is a strong drive towards changes in national and international legislations. This change has resulted in large institutions changing their own practices in order to drive the change by leading via examples. Large institutions such as universities are the leaders in driving these changes as they are able to invest through research and innovation practices as well as implement their ideas via their own pilot studies at their campuses.

Sustainability is driven at universities through a range of practices, although priority is given to the actions that are most suitable and appropriate to the problem areas of each campus as well as the ethics and practices that the university board chooses to implement. 'Green campuses' is a term that has been used, in recent years, to describe a university that chooses to introduce environmentally friendly practices in order to limit its impact onto the environment. These practices may include but are not limited to the installation and upgrade of energy efficient equipment as well as driving the change for behavioural changes.

Green campuses can either be driven by the practices of students, in a bottom-up approach, or by the governing body of the organisation from a top-down approach. The differences in approach is primarily due to the resources available to the decision making bodies.

This document is based on the international standard of ISO14001:2015 where the current environmental management plans/practices of the partner universities compared their own actions to the requirements of ISO14001:2015 in order to adhere to it. By using an internationally recognised standard, the aim of deliverable 16.1 'Carbon footprint compensation plan for EU-CONEXUS' looks to certify at least three partner universities with an ISO 14001:2015 certification whilst setting up the appropriate conditions for he other universities in becoming certified. In order for this to occur, a gap analysis was carried out where the current practices of the institutions were compared to the required ones stated in the international standard of ISO14001:2015, whilst also appropriate changes were conducted in order to adhere to the standard and receive certification.

Discussion/content:

This document, developed under Task 16.2 of the EU-CONEXUS initiative, aligns with the purpose of creating a comprehensive plan for carbon footprint compensation within the consortium. The task aims to establish a framework based on best practices in environmental management systems (EMS) to facilitate the carbon footprint compensation process effectively. In this context, this document provides a structured roadmap and guidance for EU Conexus partners in implementing an EMS during the planning stage of the carbon footprint compensation plan. It outlines key steps aimed at fostering environmental sustainability, meeting regulatory requirements, and achieving continuous improvement across the consortium. By following this roadmap, organizations can effectively identify, address, and mitigate environmental impacts while maximizing opportunities for sustainable growth within the EU-CONEXUS network.

As outlined in Task 16.2, the plan's development will commence with a detailed quantified assessment of the current carbon footprint situation across EU-CONEXUS partners. Drawing from existing successful practices, quantifiable and time-bound targets will be established to reduce the carbon footprint of network partners. These objectives are prioritized based on predefined indicators, considering both anticipated outcomes and the associated costs and resources. Furthermore, the plan establishes mechanisms and monitoring frameworks with the aim of assessing the effectiveness of its implementation. Integrated environmental management systems such as ISO 14000 or EMAS are pursued where feasible to ensure adequate implementation and monitoring of proposed measures. Additionally, emphasis is placed on addressing biodiversity aspects within the compensation plans.

The EMS framework outlined in this document aims to guide EU Conexus partners through a methodical process of environmental planning and management. It commences with an examination of stakeholder needs and expectations, emphasizing the importance of engaging diverse stakeholders to understand their perspectives on environmental management. By soliciting input from stakeholders such as students, faculty, staff, and the surrounding community, organizations can ensure that their EMS reflects societal values and priorities. Subsequently, the document addresses the determination of environmental scope, focusing on identifying organizational functions, activities, and services with potential environmental impacts. Through a comprehensive assessment, EU Conexus partners can identify areas of significant environmental concern and prioritize resource allocation accordingly. Furthermore, the document covers foundational aspects of an EMS, including the development of an environmental policy statement and the assignment of responsibilities and authorities. A well-defined environmental policy articulates organizational commitments to sustainability and serves as a guiding framework for decision-making. Assigning responsibilities and authorities ensures accountability and facilitates effective implementation of environmental tasks and initiatives across the consortium. The

subsequent sections of this document delve into key components of EMS planning, including the identification of environmental aspects and impacts, understanding compliance obligations, recognizing risks and opportunities, planning for risk mitigation and opportunity enhancement, and setting environmental objectives. Each step is accompanied by practical guidance and strategies tailored to the specific needs and contexts of EU Conexus partners.

Methodology

The development of the carbon footprint compensation plan for EU-CONEXUS partners followed a structured method based on the principles and requirements of ISO 14001: Environmental Management Systems. This approach made sure that all activities could be repeated in different universities, even when their operations and internal structures varied. As a result, the data collected across all participating institutions remained consistent, comparable, and reliable. Ensuring that replication of such practices could be enforced even after the completion of the project.

The methodology used in this document places strong focus on ISO 14001, including its purpose, the expectations of stakeholders, the process of identifying environmental aspects, compliance duties, the assessment of risks and opportunities, and the setting of objectives. This ensured that the EMS roadmap and carbon compensation plan were in line with recognised international practices and could later be expanded into full EMS certification processes if each university chose to do so.

To understand the current environmental management practices of all EU-CONEXUS universities, a detailed questionnaire was created, with open ended questions, based directly on the clauses and requirements of ISO 14001. Its aim was to gain a clear picture of practices at each campus and to compare the results with ISO 14001 needs. The questionnaire included sections on but was not limited to:

- Understanding the organisational context of each university
- Identification of internal and external stakeholders
- Existing environmental policies and commitments, including legal requirements
- Current management of environmental aspects and impacts
- Monitoring and measurement practices, where applicable
- Operational control procedures, to understand how each university is structured
- Compliance management, important for assigning internal responsibilities
- Mechanisms for continuous improvement, such as feedback tools

The full questionnaire and the detailed responses from each university, included in this study, can be found in the Appendix1 and Appendix 2. The questionnaire served as the main tool for collecting data and as the primary source for the gap analysis between current university practices and ISO 14001 requirements.

The questionnaire was first distributed to the universities, which were responsible for gathering the required information. They were given sufficient time, as universities are complex organisations and many details are not immediately available to researchers. Universities can be viewed as a microscosm, with top management acting as the main driving force within the academic world, thus a plethora of time was deemed appropriate in order for detailed responses to be collected from the universities and to be analyzed for the context of the deliverable. It was also noted that some campuses and laboratories within the same university followed different procedures and organizational patterns, which required additional time for accurate data collection – uniform procedures were not always available as case-by-case procedures are comment in large organizations.

Once all responses were received, the answers were systematically reviewed with a focus on:

- identifying practices already aligned with ISO 14001,
- detecting partial or informal alignments,
- highlighting missing elements when compared to ISO requirements, and
- identifying unique strengths or innovative practices at each institution.

This provided a clear view of the environmental management situation at each university and supported a broader understanding of practices across several coastal universities in Europe.

The consolidated gap analysis helped identify shared strengths, common gaps across the network, and recurring challenges such as limited monitoring tools or the absence of formal environmental policies. It also highlighted best practices that could be shared and expanded across the consortium. This unified approach allowed universities to address common issues collectively and to learn from one another's successful practices. These steps align directly with ISO 14001 requirements and support the development of an EMS framework for EU-CONEXUS that is strong, practical, and adaptable to the capacities of each institution.

After the data from the questionnaire was collected and analysed, each university introduced a series of changes to improve its environmental management practices. These changes focused on updating existing procedures, creating formal policies, and setting up monitoring systems in line with ISO 14001 requirements.

First, every university revised its internal procedures to match the gaps identified during the analysis. This included clarifying responsibilities, strengthening operational controls, and ensuring that environmental tasks were handled in a consistent manner across the departments and campuses that would be the centre focus of this study. As universities are extremely complex, it was deemed that in some cases whole university certification would not be an appropriate target for this study thus a smaller subsections of the universities were decided to be the main focus of the study. This

was done in the hopes that a strong ISO certification for a lab/sub-section of a university would act as a 'lighthouse' case-study which could be scaled up for wider university implementation of ISO14001 certification.

Second, a formal environmental policy was written for each campus. These policies included commitments to environmental protection, legal compliance, pollution prevention, resource efficiency, and continuous improvement. The policies were approved by campus leadership and communicated to staff, students, and relevant external stakeholders.

Third, each university identified its key environmental aspects covering all activities, services, or operations that have an impact on the environment. The aspects chosen for regular monitoring were based on their significance, level of risk, and relevance to ISO 14001.

The environmental aspects identified for monitoring across the campuses included:

- Energy consumption - both for heating, cooling, appliances and light fixtures.
- Water use – consumption within labs, bathrooms and canteens
- Waste generation - including general waste where waste was segregated in order to record a real time picture of what streams of waste are produced, recycling streams, and hazardous waste (in the cases where specific labs were being monitored).
- Chemical use and storage in laboratories and technical facilities
- Transportation impacts (staff and student commuting, university fleetvehicles)
- Use of natural resources (paper consumption, lab materials, officesupplies)
- Air quality - indoor air quality was monitored but emissions could have been also monitored should the need arose
- Biodiversity impacts on green areas and campus grounds

To support the monitoring of these aspects, appropriate sensors and measurement tools were installed. These included:

- Smart electricity meters to record energy consumption in real time
- Water flow meters to track usage in buildings and laboratories and facilities
- Indoor air quality sensors (for CO_2 levels, particulates, humidity, and ventilation quality)
- Smart scales were installed on bins for tracking waste generation, also in real time

These monitoring tools allow each university to collect reliable data, follow ISO 14001 requirements, and measure changes over time. They also support the reporting processes needed for environmental objectives, performance evaluations, and continuous improvement.

Based off the reading collected from the sensors, the day-to-day benchmarks were set for all environmental aspects and targets for the following year (12 month period) were set with the aim of acting as a monitoring tool for the successful implementation of these changes to the system. The constant monitoring of the environmental aspects in addition to trainings for behavioural changes from all individuals at the university (that have an effect on the environmental targets) allowed for not only the appropriate monitoring of the environmental aspects and adhering to the ISO standard, it also results in a greener university campus – one that can boast as being a 'Green Campus'.

Results and Discussion

This section brings together the findings from the ISO 14001 based assessment carried out across the EU-CONEXUS universities. Using the questionnaire developed, each partner institution described its current environmental practices, the systems they already have in place, and the areas where work is still needed. Looking across the responses, a clearer picture begins to form of how each university approaches environmental management and where their practices sit in relation to ISO 14001 expectations.

To make the results easier to follow, the section is divided into subsections, with each one dedicated to a single university. These subsections offer a narrative overview rather than repeating the entire questionnaire. They highlight the main findings, point out recurring issues, and discuss where each institution is already strong or where gaps remain. Since the gap analysis forms the backbone of the comparison with ISO 14001, it is given particular attention in each case.

The full set of questionnaire answers is not included here so the section remains readable. Instead, all detailed responses, comments, and supporting notes from the universities are provided in the Annex. Readers who want a deeper dive into the raw data or wish to trace how the conclusions were drawn can refer to those annexes for the complete information.

Environmental Management System - Frederick University (FredU)

This section examines Frederick University's preparatory work toward establishing an Environmental Management System, using SERG as a focused operational unit for analysis. Stakeholder expectations were assessed across students, staff, the surrounding community, and the research community, revealing consistent concerns regarding waste management, sustainability practices, energy consumption, and broader environmental impacts. Although certain sustainability initiatives exist, they remain fragmented and lack the systematic integration expected within a maturing EMS framework.

The gap analysis identifies gaps in strong stakeholder engagement, environmental education for students through elective courses as well as integration of environmental aspects in existing courses, waste infrastructure such as waste segregation (separating waste in different bins), and community outreach both within the local surrounding community as well as broader activities. Although these issues can be seen as common in early-phase environmental management system development they can indicate the need for stronger policy coordination from top management and a unified environmental 'governance' approach where a top-down approach is implemented at the university. SERG can serve as a micro-level representation ofthe university's environmental footprint, illustrating that even specialized research units require structured oversight, particularly in areas such as laboratory energy and water use, chemical handling, and research-related waste. SERG's successful implementation of an environmental management system can also act as a 'lighthouse' case study where

The environmental scope outlined in this section aligns well with ISO 14001:2015 expectations by encompassing all significant functions, physical boundaries, and operational activities. Distinguishing between the overall campus scope and SERG's operational boundaries demonstrates an appropriate understanding that EMS scopes must reflect real operational conditions rather than overly broad institutional assumptions. This clarity will support future aspect-impact assessments and prioritization.

The foundations for EMS development show measurable progress between the initial 2023 gap analysis and the follow-up in 2024. Improvements in leadership involvement, EMS team formation, formal procedures, monitoring methods, and internal communication reflect a shift from informal environmental practices toward structured environmental governance. Although the EMS is not yet fully implemented, the developmental progress is consistent with recognized EMS adoption pathways and indicates increasing institutional readiness.

The environmental policy development process follows established best practices, including policy review, stakeholder involvement, iterative drafting, and formal approval procedures. SERG's final policy statement appropriately reflects both its research mandate and the university's broader sustainability goals by emphasizing reduced environmental impact, resource efficiency, and the promotion of sustainable energy research.

The EMS roles and responsibilities introduced here demonstrate an emerging governance structure suited to the scale of SERG. The establishment of an Environmental Management Committee, an Environmental Management Representative, and cross-functional teams indicates the beginnings of a coordinated system capable of managing EMS responsibilities. Authority resides with the academic supervisor, which is proportionate for a small research-focused group in the early stages of EMS implementation.

Environmental aspects identified within this section align with typical academic and research operational profiles. These include energy and water usage, waste generation, transportation impacts, chemical handling, and the environmental implications of research outputs. SERG's specific aspects focus on laboratory operations, hazardous waste, and commuting-related emissions—appropriate priorities for a research-intensive unit.

Compliance obligations are framed in the context of Cyprus legislation and EU environmental policy requirements, including environmental impact assessment laws, extended producer responsibility mandates, pollution control regulations, public access to information, and occupational health and safety laws. This demonstrates a clear understanding of the regulatory landscape that an EMS must incorporate.

The analysis of risks and opportunities uses a SWOT framework, which, although basic compared to advanced risk methodologies, is suitable at this planning stage. The findings indicate that SERG possesses several strengths—such as existing ISO 9001 structures and strong research capacity—while acknowledging operational constraints and the need for ongoing compliance adaptation. Opportunities for enhanced reputation, funding, and educational integration are balanced with threats linked to regulatory changes and rapid technological evolution.

All finding are summarized in Table 1: Summary of EMS Readiness and Key Findings at Frederick University/ SERG

Table 1. Summary of EMS Readiness and Key Findings at Frederick University/ SERG

ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) READINESS OVERVIEW — SERG		
Category	**Key Findings**	**Implications for EMS Development**
Stakeholder Expectations	Stakeholders seek better waste segregation, stronger sustainability practices, and clearer energy/ environmental transparency	Improve engagement, environmental education, and communication
Gap Analysis	Sustainability efforts are fragmented; waste systems and outreach are limited; environmental content is weak in curricula	Strengthen top-level coordination and establish unified environmental govemance
SERG Operational Insights	Labs need improved monitoring of energy, water, chemicals, and research-related waste	SERG can serve as a pliot model for EMS rollout across the university
EMS Scope Definition	Clear separation of campus-wide and SERG-specific boundaries in line with ISO 14001	Enables accurate aspect-impact assessment and prioritization
Foundations & Progress (2023-2024)	Policy developed through review and stakeholder input; aligns with sustainability goals and SERG's mission	Meets EMS standards and commits to impact reduction and resource efficiency
Environmental Aspects	Key aspects: energy, water, waste, chemicals, fiazardous lab waste,,omelcs	Aligns with research-unit activities and supports impact prioritization

Environmental Management System - Agricultural University Athens (AUA)

The findings from the gap analysis of the Agricultural University of Athens (AUA) paint a picture of a university that wants to make changes in their operations in order to be more environmentally conscious but are lacking the mechanisms to do so.

The stakeholder groups of the university were identified, students, staff, surrounding community as well as the research community, of which all of them had environmental concerns were the environmental concerns overlapped. Some of these environmental concerns included waste management in the form of recycling programmes, energy saving technologies, awareness of energy consumption, reduction of emissions and better awareness of the environmental impact that activities have. It was noted by all stakeholder groups that there is a great need for awareness programmes for all.

The environmental scope of the AUA campus includes diverse functions such as research, laboratory courses, recreational activities, and events. It encompasses physical boundaries such as roads, buildings, fences, livestock units, parking lots, gardens, greenhouses, and recreational areas. Key activities involve energy consumption and production, water and chemical usage, recycling, and organic waste management. The campus also produces various outputs, including research publications, dairy products, eggs, honey, wine, and bioplastic from laboratory waste.

Although there is an indication of top management having approved green actions with the inclusion of an environmental management office at the university, there are no clear guidelines that the university will follow other than the integration of the 17 SDGs of the UN. Overall the university has top management involved via a lot of initiatives to promote sustainability but there is no clear indication on the targets.

The roles and responsibilities of the EMS within the organisation exist for the environmental management committee as well as the environmental management representative but there is a lack of departmental environmental coordinators and cross-functional teams.

AUA also has an extensive list and understanding of the environmental aspects of their campus energy consumption, water usage, waste generation, transportation, chemical usage, research outputs. This is also reflected within their legal obligations as the university not only recognises the legislations that they are required to adhere to but there is an extensive understanding on how each legislation related to the university's operations.

Based off the university's SWOT analysis, the following has been identified:

- Strengths: Existing recycling practices and expertise in sustainable energy.
- Weaknesses: Adaptation to EMS requirements and resource constraints.

- Opportunities: Increase recycling and funding opportunities.
- Threats: Regulatory and compliance risks.

As an academic institution, the environmental objectives were also identified with the appropriate targets to each objective as well as a strategy to follow in order to achieve said objectives. These strategies include better utilisation of equipment to reduce campus energy consumptions, an increase in collection points and awareness promotions of recycling rates. It has also been noted that there is a need for photovoltaic panel installation to address energy needs as well as promote and enhance sustainable transportation.

Overall AUA has a strong understanding and already implements aspects of an EMS but there is a need for clearer target and boundaries to be set up by top management.

All findings are summarized in Table 2, Summary of EMS Readiness and Key Findings at Agricultural University Athens.

Table 2. Summary of EMS Readiness and Key Findings at Agricultural University Athens.

ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) READINESS OVERVIEW — AUA		
Category	**Key Findings**	**Implications for EMS Development**
Stakeholder Expectations	Stakeholdera seek better waste management, energy saving technologies	Improve engagement, environmental education, and communication
Environmental Scope	Diverse functions: research, laboratory courses, events: physical boundaries;	Allows accurate aspect-impact assessment and prioritization
Foundations & Progress	Top management has approved green actions and establisrd an environmental	Signals readiness to move from informal to structured EMS governance
Environmental Policy	Policy developed through review and stakeholder input; aligns with sustainability	Meets EMS standards and commits to impact reduction and resource efficiency
Roles & Responsibilities	EMS governance structure emerging: EMC, EMR, and cross-functional teams	Provides appropriate oversight for early EMS implementation
Environmental Aspects	Key aspects; energy, water; waste, chemic-als, hazardous lab. waste, commuting im-	Aligns with research-unit activities and supports impact prioritization
Compliance Obligations	Compliance reflects laws on waste, pollu-tion, OHS, EIA, and public information	Ensures legal alignment needed for EMS planning

Environmental Management System - Klaipeda University (KU)

Within the environmental concerns of the stakeholders of Klaipeda University the following concerns arose from the 4 stakeholder groups, lack of sustainability practices, need for environmental education workshops, need for enhanced waste management strategies, lack of sustainable transportation incentives, lack of community engagement.

The environmental scope of the institution addresses all 4 environmental aspects with an emphasis on educational activities, administrative functions, all campus buildings as well as any outside campus landscaping, energy production and consumption, water usage, waste generation as well as educational and vocational courses, research outputs and any supportive services that may be needed for the university to function.

Klaipeda university has support from the vice-rector for EMS proceedings yet there is no full commitment demonstrated, this is reflected in the resources that are allocated by top management for EMS purposes, there is no in-depth review of environmental issues, there an environmental policy in place but with limited specific commitments.

Within the top management of the university, there are some roles missing such as environmental management committee but it is clear that the heads of faculties are responsible for the EMS implementation. An extensive legal understanding and implementation is also recognized by the university. Through the SWOT analysis, the weak points of the organization are highlight with the key points being top management changes, lack of funding.

Klaipeda University has clear and realistic targets established, as well as strategies on how to achieve them within the next 3 years. These targets include reduction in electricity consumption, heating energy consumption, water consumption, material consumption.

All findings are summarized in Table 3, Summary of EMS Readiness and Key Findings at Klaipeda University

Table 3. Summary of EMS Readiness and Key Findings Klaipeda University.

ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) READINESS OVERVIEW – KLAIPEDA UNIVERSITY		
Category	**Key Findings**	**Implications for EMS Development**
Stakeholder Expectations	Lack of sustainability practices, need for environmental education workshop	Improve engagement Increase workshops
Environmental Scope	Educational activities, administrative functions buildings campus landscaping	Allows greater recessen-commitment, resource allocation
Foundations & Progress	Support from vice-rector but limited specific commitments	Need for greater top management commitment and resource allocation
Roles & Responsibilities	No environmental managemerite EMC Faculty heads res-ponsible	Oversight needs dring top management changes
Environmental Aspects	No environmenit management comm-ittee EMC, faculty heads responsible	Allgns with research-unit targets supports impact priorifization
Compliance Obligations	Extensive legal understanding	Aligns with research-unit targets, supports impact prioritization
Compliance Obligations	Extensive legal understanding	Ensures legal alignment needed for EMS planning

Environmental Management System - La Rochelle University

The environmental scope of La Rochelle Université includes educational, administrative, recreational, and cultural activities, along with student life. Physical boundaries encompass campus buildings, green spaces, and transportation infrastructure. Activities involve energy and water consumption, waste generation, transportation, chemical usage, land use, and purchases related to various university functions. Products and services include educational programs, research outputs, and support services.

The current status at La Rochelle Université shows a commitment to sustainability, with one employee in charge of Sustainable Development linked to senior management. The university has calculated its carbon footprint and voted on an

environmental policy. However, there is a need for more structured involvement in sustainability efforts, setting specific decarbonization targets, creating procedures to maintain action plans, and enhancing training and communication channels about environmental practices.

La Rochelle Université has an Environmental Management Committee (EMC) and an Environmental Management Representative (EMR), Thomas Duban, coordinating sustainability activities. While there are no specific departmental coordinators, some departments handle environmental aspects, and decisions are made by the governing board. The university follows a Sustainable Development and Social Responsibility (SDSR) approach, having obtained the SDSR certification label in 2022.

The key environmental aspects at La Rochelle Université include energy consumption for heating, cooling, and lighting; water usage in various facilities; waste generation from different activities; commuting-related transportation emissions; chemical usage in research and teaching; land use for construction and maintenance; and the environmental impact of research outputs.

La Rochelle Université complies with several key legislations, such as the AGEC Law for waste reduction and circular economy, the Tertiary Decree for reducing energy consumption, and other measures for sustainable transport, building renovation, and energy sobriety. The university has taken steps like installing water fountains to reduce plastic waste and planning building renovations to meet these regulations.

La Rochelle Université's strengths include the SDSR certification, a strategic sustainability plan, and a research group on sustainable commuting. Opportunities arise from ministry plans and ongoing strategic initiatives. However, weaknesses involve the time and cost of measures like building renovations, and threats include potential changes in university governance.

The university aims to reduce its carbon footprint by 5% each year until 2030, increase sustainable commuting, and cut energy consumption by 10% by 2024. Strategies include reducing professional travel, promoting sustainable commuting, raising awareness, and renovating buildings for energy efficiency. An energy manager has been recruited to oversee these actions.

All findings are summarized in Table 4, Summary of EMS Readiness and Key Findings at La Rochelle University.

Table 4. Summary of EMS Readiness and Key Findings La Rochelle University.

ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) READINESS OVERVIEW — LA ROCHELLE UNIVERI É		
Category	**Key Findings**	**Implications for EMS Development**
Stakeholder Expectations	Sustainability cammitment exists; carbon footprint calculated; SDSR" certification achieved	Strengthen engagement, expand environmental training, formalize communication channels, and build structel-sustainability governance
Environmental Scope	Covers educational, administrative, recreational, cultu-	Enable comprehensive aspect-impact identificication and prioritization
Foundations & Progress	One employee over-sees sust, bevelopm-ent, environmental policy has been vot-ed, carbon footprint	Signals readiness to formalize sustainability efforts and decarbonization goals
Roles & Responsibilities	EMC and EMR in place, no specific department coordi-mators decisions made by governing	Establish departmental roles and processes would enhan-ce cooordination
Environmental Aspects	Key aspects; energy use, consumption, activity-derived was te, communiting-lan	Aligns with SDSR certification and supports aspect prioritiza-tion
Compliance Obligations	Legislations include AGEC Law, Tertiary Dectee, sustainab-le transport meas-ures, building reno-vation plans pham	Installing measure to meet laws, reducring resource use

Environmental Management System - Technical University of Civil Engineering of Bucharest (UTCB)

Although UTCB is certified with ISO14001:2015 the following were observed. The environmental scope of the UTCB campus covers educational, administrative, and recreational activities within physical boundaries such as buildings, green spaces, and transportation infrastructure. The activities include energy consumption, water usage, waste generation, transportation, chemical usage, and land use.

Through the Environmental Management System gap analysis, it was notes that at UTCB, there is a lack of leadership commitment, dedicated EMS team, environmental assessments, and formalized procedures and controls. Some progress includes limited policy development and initial procedures under ISO 14001:2015, but significant gaps remain in awareness, training, and performance monitoring.

Key roles like Environmental Management Committee and Departmental Environmental Coordinators are not defined, indicating a lack of clear accountability and delegation. There is also a need for improved infrastructure and practices to manage these impacts effectively.

In regards to legal compliance, only 3 Romanian laws were indicated, specifically higher education, national education, and occupational health and safety. These laws guide UTCB's environmental and operational responsibilities but only the occupational health and safety is acknowledged within the relevance of UTCB operations.

During the SWOT analysis for adopting EMS at UTCB, the strengths identified relate to student involvement and expertise in sustainability, opportunities for reputation enhancement and funding, weaknesses in financial and human resources, and threats from regulatory and political contexts.

The environmental objectives were also identified such as reducing disposable product usage, campus energy consumption, and increasing recycling rates. Strategies include infrastructure investments, partnerships for sustainable practices, and awareness campaigns to achieve these targets but no specific targets were identified.

All findings are summarized in Table 5, Summary of EMS Readiness and Key Findings at UTCB.

Table 5. Summary of EMS Readiness and Key Findings UTCB.

ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) READINESS OVERVIEW — UTCB		
Category	**Key Findings**	**Implications for EMS Development**
Stakeholder Expectations	Gaps Identified during EMS gap analysis; Lack of leadership commitment, dedicated EMS team	Address leadership gap provide EMS support, pciforming assessments, aned develop procedures and controls; and build strucctured accessory-contrils
Environmental Scope	Limited policy development, 'Initial procedures under ISO 14001 standards; signiticant gaps in awareness; training	Enable comprehensive aspect-impact identification and prioritization
Foundations & Progress	No roles I(defined: key rojes; Icc EMC and DPCCs	Establish EMS committetee and processes would enhance infrastructure and
Roles & Responslbilities	Objectives; raticucive gtisposable product usage	Align with objectives and highlight infrastructure and awareness needs
Environmental Aspects	Objectives; reduce disposable product usege, campus energy consumption	Align with objectives and highlight infrastructure-ad awareness needs
Compliance Obligations	Three Romanian laws; higher and national aducation and ocoupatiosal health and	Expand legal compliance awareness beyond occupational safety

Environmental Management System – University of Rostock (UROS)

The environmental scope at the University of Rostock were identified and included educational, administrative, and recreational activities within the campus. The physical boundaries encompass academic buildings, green spaces, and transportation infrastructure. Key activities include energy consumption, water usage, waste generation, transportation, chemical usage, and land use. The university's products and services span educational programs, research outputs, and various support services.

During the gap analysis of environmental concerns across stakeholder groups at UROS. It highlights gaps such as insufficient energy-saving initiatives and green spaces, limited focus on workplace sustainability and transportation incentives for staff, and a need for more comprehensive environmental impact assessments.

The roles and responsibilities within the Environmental Management System (EMS) structure at UROS were also identified as the following:

The Environmental Management Committee (EMC) consists of senior university officials, while Andreas Tesche is the Environmental Management Representative (EMR). Some faculties have dedicated environmental coordinators, and temporary cross-functional teams are formed for specific projects. The rectorate is responsible for decision-making within the EMS structure.

The significant environmental aspects at UROS, including energy consumption for heating, cooling, and lighting; water usage in laboratories, offices, and classrooms; waste generation from various activities; transportation emissions; and chemical usage in research and maintenance activities were also identified and highlighted in extensive detail.

All details of legal compliance, referencing German legislation and principles relevant to UROS operations were also documented. These include the Sustainability Code for higher education institutions, the Federal Climate Protection Programme, and the Climate Protection Act, which provide frameworks for sustainable practices and policies.

The SWOT analysis for adopting EMS at UROS shows that the strengths include accredited quality standards and dedicated research infrastructure, while opportunities involve enhanced reputation and funding. Weaknesses highlight resource constraints, and threats include regulatory and compliance risks.

During the environmental objectives' analysis for UROS were also identified, 2 objectives only, such as reducing campus energy consumption by 10% by 2030 and reducing campus CO2 emissions by 15% by 2025. The appropriate strategies for implementing these objectives were also identified, such as energy efficiency upgrades, renewable energy projects, and promoting sustainable transportation options.

All findings are summarized in Table 6, Summary of EMS Readiness and Key Findings at University of Rostock

Table 6. Summary of EMS Readiness and Key Findings University of Rostock.

ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) READINESS OVERVIEW — UROS (UNIVERSITY OF ROSTOCK)		
Category	**Key Findings**	**Implications for EMS Development**
Stakeholder Expectations	Gaps identified: insufficient energy-saving initiatives, limited green spaces, weak workplace sustainability, and	Improve sustainability engagement, expand energy-saving initiatives, enhance green spaces, provide transport incentives, and strengthen impact assessment processes
Environmental Scope	Covers educational, administrative, and recreational activities	Supports accurate aspect–impact identification and prioritization
Foundations & Progress	Gap analysis shows partial progress; limited policy iSO 14001 procedu-	Move toward structured EMS governance, expand training, formalize procedures, introduce performance monitoring
Roles & Responsibllities	EMC anaysis shows partial progress: limited policy Isyvelopment, early	Strengthen coordinator roles, formalize responsibilities, and enhance cross-faculty EMS collaboration
Environmental Aspects	Significant aspects include energy use, waste generation, transport emissions	Supports targeted improvements aligned with EMS prorities and sustainability goals
Compliance Obligations	Compliance with German frameworks; Sustainability Code,	Translate objectives into measurable EMS action plans with timelines and KPIs
Environmental Objectives	Compliance with German frameworks; Sustainability Code, Climate Protection Act	Ensure objectives into measurable EM3 actiorplans with timelines and KPIs

Environmental Management System - Overview of findings of all universities

The analysis of the environmental management practices at the Agricultural University of Athens (AUA), Klaipeda University, La Rochelle Université, UTCB, and the University of Rostock (UROS) reveals common concerns and goals across these institutions. AUA aims to become more environmentally conscious but lacks effective mechanisms to do so. Key stakeholder groups, including students, staff, the surrounding community, and the research community, share common environmental concerns such as waste management, energy consumption, emission reduction, and awareness of environmental impact. These concerns are echoed at Klaipeda University, where additional issues like the need for environmental education workshops, waste management strategies, sustainable transportation incentives, and community engagement were highlighted.

The environmental scope at these universities generally encompasses educational and administrative activities, recreational activities, and research outputs within physical boundaries that include buildings, green spaces, and transportation infrastructure. Specifically, AUA's scope includes diverse functions such as research, laboratory courses, livestock units, parking lots, gardens, and greenhouses. La Rochelle Université's scope includes cultural activities and student life, while UTCB and UROS focus on academic buildings, laboratories, and green spaces.

Despite commitments to sustainability, the level of structured involvement varies. At AUA, top management has approved green actions and established an environmental management office, but clear guidelines and specific targets are missing. Klaipeda University has support from the vice-rector but lacks full commitment and specific roles. La Rochelle Université has an Environmental Management Committee (EMC) and an Environmental Management Representative (EMR), but it needs more structured involvement and clearer targets. Although UTCB is ISO 14001:2015 certified, it lacks leadership commitment and a dedicated EMS team. UROS has defined roles within its EMS but requires more comprehensive environmental assessments.

All universities recognize the importance of adhering to relevant environmental legislation and have a detailed understanding of their legal obligations. AUA shows extensive understanding and compliance with applicable legislation. Klaipeda University complies with key environmental laws, and La Rochelle Université follows the AGEC Law, Tertiary Decree, and others. UTCB focuses on a few national laws, mainly in higher education and occupational health and safety. UROS adheres to German sustainability and climate protection laws. The SWOT analysis of these universities highlights common strengths, weaknesses, opportunities, and threats. Strengths include existing sustainable practices and expertise in environmental aspects. Weaknesses often involve adaptation to EMS requirements and resource

constraints. Opportunities arise from increased recycling and sustainability funding, while threats typically involve regulatory and compliance risks and political and governance changes. For instance, AUA has strengths in recycling and sustainable energy but needs better EMS adaptation. Klaipeda University faces top management changes and lack of funding, while La Rochelle Université benefits from SDSR certification but struggles with the cost and time of implementing measures. UTCB has strong student involvement but lacks financial and human resources. UROS has accredited standards and dedicated research infrastructure but faces resource constraints.

The environmental objectives and strategies across these universities focus on reducing energy consumption, increasing recycling rates, and promoting sustainable transportation. AUA aims to reduce campus energy consumption and install photovoltaic panels. Klaipeda University targets reductions in electricity, heating energy, water, and material consumption. La Rochelle Université aims to reduce its carbon footprint by 5% annually until 2030, increase sustainable commuting, and cut energy consumption by 10% by 2024. UTCB seeks to reduce disposable product usage and campus energy consumption while increasing recycling rates. UROS aims to reduce campus energy consumption by 10% by 2030 and CO2 emissions by 15% by 2025. Strategies for achieving these targets include better utilization of equipment, awareness promotions, building renovations, energy efficiency upgrades, renewable energy projects, and promoting sustainable commuting options.

In summary, while each university has unique challenges and strengths, they share a common commitment to improving their environmental management practices. They are all working towards integrating sustainable practices more deeply into their operations, guided by stakeholder concerns, legal compliance, and strategic objectives

All findings are summarized in Table 7, Summary of EMS Readiness and Key Findings for all Universities.

Table 7. Summary of EMS Readiness and Key Findings for all Universities

ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) READINESS OVERVIEW — SUMMARY OF ALL UNIVERSITE		
Category	**Key Findings**	**Implications for EMS Development**
Stakeholder Expectations	Stakeholders across all universities seek better waste management, energy-saving initiatives. stronger communtion Gaps include insut-ic	Improve engagement; expand sustainability fraining, strengthen commmunicication create incentives for sustaina-ble commuting, end improve campus-wide environmental cu-iture
Environmental Scope	All universities cover educational, administrative, research, recreaterg-al and suport activites	Supports accurate aspct-impac identification and prioritization for EMS development.
Foundations & Progress	Varied stage of EMS development:	Need to formalize governance, strengthen training and awareness, develop structured procedures, and **buil**d performa-
Roles & Responsibilities	EMG and EMR exist in La Rochelle, Kialpeda, UROS, and AUA, UTEB lacks defined roles: SERG has early structred	Estaḅiish or strengthen EMC, EMR, deportmental coordinato-rs, and cross-functional reams to enhance EMS implementatio-on enhance EMS implementation
Environmental Aspects	Common aspects across institution inclu-de Energy use	Align aspects with sustainability goals, improve monitoring, data collection, and impact priortization
Compliance Obllgations	Compliance varies: AUA (waste, pollution, OHS), I.kiapeḍa (legal awareness but limited)	Use strangths as leverage for EMS rollout; address resource gaps; mitigate regulatory risks
SWOT / Risks & Opportunities	Strengths; research ex-pertise, student involve-ment; certifications (ḷa Rochelle, UROS)	Translate objectives into measu-rable EMS action plans with KPis, timelines, and responsible roles
Environmental Objectives	La Rochelle; reduce-carbon footprint 5 %0%, UROS; reduce energy a disposable products:	Transiate objectives into measu-rable EMS action plans with KPIs, timelines, and responsible roles

Conclusion:

The comprehensive assessment of environmental management practices across the EU-CONEXUS partner universities demonstrates that, while each institution operates within distinct organisational, cultural, and infrastructural contexts, they collectively exhibit a growing commitment to embedding sustainability within their strategic and operational frameworks. By employing a unified methodology grounded in the ISO 14001:2015 Environmental Management System (EMS) standard, this study enabled a systematic, comparable, and scientifically rigorous evaluation of current practices, institutional capacities, and readiness for sustainable transformation across the consortium.

The gap analyses revealed that all universities have already implemented elements of an EMS such as recycling initiatives, awareness activities, compliance with national environmental legislation, and targeted sustainability actions yet these efforts frequently remain fragmented, informal, or insufficiently integrated into long-term institutional governance. Common gaps across institutions relate to the absence of comprehensive environmental policies, limited monitoring and measurement systems, inadequate allocation of resources for EMS implementation, and a need for clearer leadership commitment and structured responsibilities. These findings underscore the importance of transitioning from isolated sustainability initiatives toward coordinated, policy-driven environmental governance supported by systematic controls, documented procedures, and formal performance evaluation mechanisms.

Despite these challenges, the universities also demonstrate significant collective strengths: high stakeholder awareness of environmental concerns, strong research expertise in sustainability-related fields, existing legal compliance structures, and widespread willingness to adopt more rigorous environmental management processes. The substantial convergence in identified environmental aspects energy and water consumption, waste generation, transportation emissions, chemical handling, and land use further supports the feasibility of developing a harmonized, consortium-wide approach to environmental management and carbon footprint mitigation.

A major achievement emerging from this coordinated effort is the successful ISO 14001:2015 certification of three EU-CONEXUS partner universities Frederick University, Klaipeda University, and UTCB. This milestone not only fulfils the primary objective set under Deliverable 16.1 but also provides empirical evidence that the implementation methodology, guidance materials, and collaborative mechanisms developed within this project are effective and transferable across institutions with diverse operational structures. These certifications serve as proof-of-concept demonstrations, showing that structured EMS adoption is both feasible and scalable within the consortium. Furthermore, they establish foundational best-practice models

that can be replicated by the remaining partner universities as they progress toward their own certification goals.

The examples provided through Frederick University and the Sustainable Energy Research Group (SERG) further illustrate that incremental, unit-level EMS implementation can successfully pave the way for broader institutional certification, offering a scalable model for other partners. Such micro-level case studies highlight that ISO 14001 adoption is achievable even in complex university settings when supported by systematic planning, internal communication, and targeted capacity building.

Overall, the consolidated findings of this study scientifically validate the relevance and applicability of ISO 14001:2015 as a unifying framework for the EU-CONEXUS carbon footprint compensation plan. By identifying shared needs, common risks, institutional strengths, and opportunities for collaboration, the assessment provides a robust foundation for establishing a consortium-wide EMS that is evidence-based, adaptable, and aligned with international standards. Implementing the recommended EMS components clear policy direction, systematic aspect impact assessment, strengthened monitoring, enhanced stakeholder engagement, and continuous improvement mechanisms will enable EU-CONEXUS universities not only to achieve ISO certification where desired but also to meaningfully reduce their environmental footprint and contribute to long-term sustainability goals.

In conclusion, this work lays the scientific groundwork for a coherent, collaborative, and scalable environmental management strategy across EU-CONEXUS. The successful certification of Frederick University, Klaipeda University, and UTCB demonstrates the effectiveness of the consortium’s approach and marks a significant step toward long-term environmental stewardship, operational excellence, and measurable carbon footprint reduction across the entire network as well as establishing what a Green Campus is.



Figure 1. Overall Findings of EU-CONEXUS+ D16.1 Green Campuses

Annex 1 – The Questionnaire

Q1. Primary environmental concerns

What are the primary environmental concerns of our interested parties (students, staff, surrounding community, research community), and how can we engage with them to understand their expectations for our EMS?

Understanding the primary environmental concerns of Academia's interested parties, including students, staff, the surrounding community, and the research community, is crucial for developing an effective Environmental Management System (EMS). Here's a breakdown of potential environmental concerns and ways to engage with these stakeholders to understand their expectations:

Q2. Environmental Concerns and Engagement Strategies Across Stakeholder Groups

Stakeholder Group	**Primary Environmental Concerns**	**Engagement Strategies**
Students	- Sustainability practices - Waste management - Energy efficiency - Environmental education and activism	- Surveys - Focus groups - Town hall meetings - Establish student-led environmental groups/committees
Staff	- Workplace sustainability - Energy use - Waste management - Transportation options	- Workshops - Training sessions - Anonymous suggestion boxes - Encourage staff participation in initiatives
Surrounding Community	- Pollution - Noise - Traffic congestion - Land use - Environmental footprint	- Community forums - Open houses - Neighborhood meetings - Collaboration with local organizations/authorities
Research Community	- Environmental conservation - Biodiversity - Climate change adaptation - Sustainable development	- Partnerships with researchers - Joint studies/projects - Seminars/conferences - Research symposiums

Q3. Activities with environmental impact

What are the main functions, physical boundaries, activities, products, and services of our campus that could impact the environment, and how can we define our environmental scope based on these elements?

According to ISO 14001:2015, the international standard for environmental management systems, the environmental scope is defined as follows:

“Environmental Scope: The extent and boundaries of an organization's environmental management system (EMS), which encompasses the activities, products, and services of the organization that interact or can interact with the environment. This includes the organization's control and influence over these aspects, as well as the environmental impacts associated with its operations within the defined scope. “

The environmental scope provides clarity on the environmental aspects to be considered, the objectives and targets to be established, and the applicable legal and other requirements to be complied with within the framework of the EMS. The organization is responsible for defining and documenting its environmental scope, ensuring that it accurately reflects the nature, scale, and environmental significance of its activities, products, and services, and regularly reviewing and updating it as necessary to maintain its relevance and effectiveness.

To determine the environmental scope of Frederick University campus, it's essential to identify the main functions, physical boundaries, activities, products, and services that could potentially impact the environment. Here's an analysis:

Main Functions:

- Educational activities: Teaching, research, and academic programs.
- Administrative functions: Management, operations, and support services.
- Recreational and cultural activities: Sports events, cultural programs, and community activities.

Physical Boundaries:

- Campus buildings: Academic buildings, administrative offices, laboratories, libraries, dormitories, and recreational facilities.
- Grounds and landscaping: Green spaces, lawns, gardens, trees, and outdoor areas.
- Transportation infrastructure: Parking lots, roads, walkways, and bicycle lanes.

Activities:

- Energy consumption: Heating, cooling, lighting, and electricity usage in buildings.
- Water usage: Drinking water consumption, irrigation, and wastewater generation.
- Waste generation: Solid waste, recycling, and hazardous waste disposal.
- Transportation: Commuting of students, faculty, and staff, as well as university-owned vehicle use.
- Chemical usage: Laboratory operations, cleaning products, and maintenance activities.
- Land use: Construction, landscaping, and expansion projects.

Products and Services:

- Educational programs and courses offered by the university.
- Research outputs and publications.
- Support services such as food services, printing, and maintenance.

Q4. Overview of the Environmental Scope in the University

Environmental Scope	Description
Functions	- Educational activities (teaching, research, academic programs) - Administrative functions (management, operations, supportservices) - Recreational and cultural activities (sports events, cultural programs)
Physical Boundaries	- Campus buildings (academic buildings, administrative offices, laboratories, dormitories, recreational facilities) - Grounds and landscaping (green spaces, lawns, gardens) - Transportation infrastructure (parking lots, roads, walkways)
Activities	- Energy consumption (heating, cooling, lighting, electricity usage) - Water usage (drinking, irrigation, wastewater) - Waste generation (solid waste, recycling, hazardous waste) - Transportation (commuting, vehicle use) - Chemical usage (laboratories, cleaning, maintenance) - Land use (construction, landscaping)
Products and Services	- Educational programs and courses - Research outputs and publications - Support services (food, printing, maintenance)

Q5. key components to establish an EMS on a campus

What are the key components we need to establish an EMS on our campus, and what are the initial steps we should take to implement such a system?

Key Components of an EMS:

- Policy Commitment: Develop an environmental policy statement that outlines your campus's commitment to environmental protection, compliance with relevant regulations, and continual improvement of environmental performance.
- Planning: Define the scope of your EMS, identify environmental aspects and impacts associated with campus activities, set environmental objectives and targets, and establish action plans to achieve them.
- Implementation and Operation: Assign roles and responsibilities for implementing the EMS, provide appropriate resources and training, develop procedures and controls to manage environmental aspects, and establish communication channels to raise awareness and engage stakeholders.
- Evaluation and Compliance: Monitor and measure key environmental performance indicators, conduct regular audits to assess compliance with legal and other requirements, and evaluate the effectiveness of your EMS through periodic reviews.
- Continual Improvement: Identify opportunities for improvement based on performance data and feedback, implement corrective and preventive actions to address non-conformities and prevent recurrence, and strive for ongoing enhancement of your campus's environmental performance.

Initial Steps to Implement an EMS:

1. Leadership Commitment: Obtain buy-in and support from senior management to prioritize environmental management and allocate resources for EMS implementation.
2. Establish an EMS Team: Form a cross-functional team representing various departments and stakeholders to oversee the development and implementation of the EMS.
3. Conduct an Initial Environmental Review: Identify and assess the environmental aspects and impacts of campus operations, including energy use, water consumption, waste generation, transportation, and chemical usage.
4. Develop an Environmental Policy: Draft a concise and clear environmental policy statement that reflects your campus's commitment to environmental stewardship and sustainability goals.
5. Define Environmental Objectives and Targets: Set measurable goals aligned with your campus's environmental policy and operational priorities, considering areas for improvement identified during the initial environmental review.
6. Establish Procedures and Controls: Develop documented procedures and operational controls to manage significant environmental aspects and ensure compliance with relevant regulations and standards.
7. Raise Awareness and Train Personnel: Provide training and awareness programs to educate staff, students, and other stakeholders about their roles and responsibilities within the EMS and the importance of environmental protection.
8. Implement Communication Channels: Establish effective communication channels to facilitate internal and external communication on environmental matters, including feedback mechanisms and reporting procedures.
9. Monitor and Measure Performance: Implement systems for monitoring and measuring key environmental performance indicators, such as energy consumption, waste generation, and greenhouse gas emissions.
10. Document EMS Documentation: Maintain documentation of EMS procedures, records, and other relevant documents to demonstrate compliance with requirements and facilitate continual improvement.

Q6. Initial Steps Required to Implement an EMS

Action	Description
Leadership Commitment:	- Obtain endorsement from senior management for the establishment of an EMS. - Assign responsibility to a designated individual or committee to lead EMS implementation efforts. - Allocate necessary resources, including funding and personnel, to support EMS development and implementation.
Establish an EMS Team:	- Form a cross-functional EMS team representing key departments and stakeholders. - Identify individuals with expertise in environmental management, operations, compliance, and communication. - Define roles and responsibilities for EMS team members, including leadership, coordination, and implementation tasks.
Conduct an Initial	- Perform a comprehensive assessment of campus activities, operations, and environmental aspects. - Identify and evaluate environmental impacts

Environmental Review:	associated with energy consumption, water usage, waste generation, transportation, and chemical usage. - Gather relevant data through site inspections, records review, and stakeholder consultations.
Develop an Environmental Policy:	- Draft a formal environmental policy statement reflecting Frederick University's commitment to sustainability and environmental stewardship. - Involve key stakeholders, including senior management, faculty, staff, and students, in policy development. - Ensure the policy aligns with organizational values, legal requirements, and industry standards.
Develop an Environmental Policy:	- Establish measurable environmental objectives and targets based on the findings of the initial environmental review. - Prioritize areas for improvement, such as reducing energy consumption, enhancing waste management practices, and promoting sustainable transportation. - Set specific, achievable targets with clear timelines for implementation and review.
Establish Procedures and Controls:	- Develop documented procedures and operational controls to manage significant environmental aspects. - Implement measures to reduce environmental impacts, such as energy-saving initiatives, waste reduction strategies, and pollution prevention measures. - Define roles, responsibilities, and accountability for implementing and monitoring environmental procedures.
Raise Awareness and Train Personnel:	- Conduct training sessions and awareness programs to educate faculty, staff, and students about the importance of environmental management. - Provide guidance on EMS policies, procedures, and their roles in achieving environmental objectives. - Offer specialized training for personnel involved in environmental management.
Implement Communication Channels:	- Establish formal communication channels for internal and external stakeholders to engage in environmental matters. - Launch an EMS website or portal to disseminate information, updates, and resources related to environmental management. - Encourage feedback, suggestions, and reporting of environmental concerns through designated channels.
Monitor and Measure Performance:	- Implement systems for monitoring and measuring key environmental performance indicators (KPIs). - Set up metering and tracking systems to monitor energy consumption, water usage, waste generation, and other relevant metrics. - Establish regular reporting mechanisms to track progress against environmental objectives and targets.
Document EMS Documentation:	- Develop and maintain documentation of EMS procedures, records, and other relevant documents. - Create a centralized repository for EMS documentation, ensuring accessibility and version control. - Regularly review and update EMS documentation to reflect changes in policies, procedures, and regulatory requirements.

How can we develop an environmental policy statement that reflects our commitment to environmental protection and improvement, and who should be involved in its creation?

In navigating the path towards environmental sustainability, the development of a robust Environmental Policy Statement is paramount for academic institutions. Beginning with stakeholder engagement, including faculty, staff, and students, institutions conduct comprehensive environmental assessments to gauge their impact. Through setting clear objectives and seeking feedback, the policy statement reflects collective aspirations. Implementation and monitoring mechanisms ensure adherence to the policy's principles. By embracing this approach, academic institutions demonstrate their commitment to environmental stewardship, fostering a culture of sustainability for the benefit of current and future generations.

The steps to deliver an Environmental Policy statement for an academic institution include:

1. Policy Review: Review of existing institutional policies to ensure alignment with overarching organizational objectives and values.
2. Stakeholder Engagement: Engage key stakeholders, including faculty, staff, students, and department representatives, in the policy statement development process to ensure inclusivity and diverse perspectives.
3. Defining Policy Principles: Draft clear and concise policy principles that articulate the institution's commitment to environmental conservation and sustainable practices, including pledges to reduce waste, conserve energy, and comply with regulations.
4. Formulating Policy Statements: Develop succinct policy statements that articulate the institution's environmental goals and commitments in a manner easily understandable to all stakeholders.
5. Seeking Stakeholder Input: Solicit feedback and input from stakeholders on the draft policy statements through workshops, surveys, or focus groups to ensure representation and gather valuable insights.
6. Finalizing and Approving Policy Statement: Revise the environmental policy statement based on stakeholder feedback, seeking approval from senior management or relevant governing bodies within the institution.
7. Communicating and Implementing: Once approved, disseminate the environmental policy to all stakeholders, ensuring clear understanding of roles and responsibilities for policy implementation.
8. Monitoring and Reviewing: Establish mechanisms for monitoring and evaluating the effectiveness of the environmental policy statement, including regular assessments and feedback mechanisms to track progress and identify areas for enhancement.

Q7. Management EMS structures

What structure should we establish for managing our EMS, and how can we effectively assign responsibilities and authorities for environmental tasks?

Establishing a structured framework for managing an Environmental Management System (EMS) is crucial for its effective implementation. The main roles include:

Q8. Roles and Responsibilities in Environmental Management System (EMS) Structure

Role	Description
Environmental Management Committee (EMC)	- Purpose: Oversees the development, implementation, and continuous improvement of the EMS. - Composition: Representatives from key departments including management, operations, environmental health and safety, facilities, and sustainability. - Responsibilities: Sets EMS objectives and targets, reviews performance, allocates resources, and ensures compliance with environmental regulations.
Environmental Management Representative (EMR)	- Role: Designated individual responsible for coordinating EMS activities and serving as the primary point of contact for environmental matters. - Responsibilities: Facilitates communication between departments, conducts internal audits, ensures compliance, and reports to senior management.
Departmental Environmental Coordinators	- Role: Assigned within each department to oversee environmental tasks and initiatives. - Responsibilities: Implements department-specific environmental procedures, conducts training, monitors performance, and reports to the EMR.
Cross-Functional Teams	- Purpose: Formed as needed to address specific environmental projects or initiatives. - Composition: Members from various departments with relevant expertise and skills. - Responsibilities: Collaborates on environmental improvement projects, conducts research, and implements best practices.
Authorities and Delegated Responsibilities	- Define Authority Levels: Clearly outline authority levels for decision-making and implementation within the EMS structure. - Training and Awareness: Ensure personnel understand their roles, responsibilities, and authority levels through comprehensive training and awareness programs. - Regular Review: Periodically review and update the delegation of authorities to align with organizational changes and evolving environmental requirements.

How can we identify and assess the environmental aspects of our campus activities, products, and services, and their potential impacts on the environment?

According to ISO 14001:2015, the international standard for environmental management systems, the environmental aspect is defined as follows:

"An element of an organization's activities, products, or services that interacts with the environment. This interaction can have a positive or negative impact on the environment, such as emissions to air, discharges to water, energy consumption, waste generation, or land use. Identifying and understanding environmental aspects is essential for an organization to effectively manage its environmental performance and minimize adverse impacts on the environment."

Identifying and assessing environmental aspects and impacts is crucial for understanding the potential environmental effects of campus activities, products, and services. Here's how this process can be approached:

1. Conduct a Comprehensive Review: Begin by conducting a thorough review of all campus activities, products, and services. This includes academic programs, research endeavors, administrative operations, facilities management, transportation, and procurement processes.
2. Engage Stakeholders: Involve relevant stakeholders from various departments and levels of the institution in the identification process. This ensures diverse perspectives and insights are considered. Stakeholders may include faculty, staff, students, facility managers, and environmental health and safety personnel.
3. Categorize Activities and Operations: Categorize campus activities and operations based on their nature, scale, and potential environmental impacts. This could include energy consumption, water usage, waste generation, air emissions, chemical usage, land use, and biodiversity impacts.
4. Conduct Environmental Impact Assessments: Perform environmental impact assessments for each identified aspect or operation. Assess the potential effects on air quality, water quality, soil quality, biodiversity, ecosystems, human health, and regulatory compliance.
5. Use Tools and Techniques: Employ various tools and techniques to aid in the identification and assessment process. This may include environmental audits, checklists, risk matrices, life cycle assessments, and environmental management software.
6. Prioritize Environmental Aspects: Prioritize environmental aspects based on their significance and potential impacts. Focus on aspects that pose the greatest risks to environmental sustainability, regulatory compliance, and stakeholder expectations.
7. Document Findings: Document the findings of the environmental aspect and impact assessment process. This includes recording identified aspects, their associated impacts, and relevant data and information used for assessment.
8. Review and Update Regularly: Regularly review and update the list of environmental aspects and impacts to ensure it remains current and reflective of evolving campus activities, products, and services. This ensures the effectiveness of environmental management efforts over time.

The environmental aspects of the Environmental Management System (EMS) for academic institutions encompass various elements related to their operations, activities, and services:

Energy Consumption:

- Heating, cooling, and lighting of research laboratories, academic buildings, administrative offices, and classrooms.
- Electricity usage for equipment, computers, classroom technology, and research facilities.
- Energy consumption associated with renewable energy systems and experimental setups.
- Energy usage for classroom lighting, heating, and cooling.

Water Usage:

- Drinking water consumption in laboratories, offices, classrooms, and communal areas.
- Irrigation water usage for maintaining green spaces, landscaping, and outdoor areas.
- Wastewater generation from research activities, cleaning processes, and laboratory experiments.
- Water usage in laboratories, classrooms, and student facilities.

Waste Generation:

- Solid waste generated from research materials, packaging, office activities, and teaching materials.
- Recycling activities for paper, plastic, glass, and other recyclable materials.
- Hazardous waste generation from laboratory experiments, chemical usage, and disposal.
- Waste generation from discarded teaching materials, packaging, and office supplies.

Transportation:

- Commuting-related emissions from faculty, staff, and students traveling to and from campus for classes and research.
- Vehicle use for transportation of research equipment, materials, and personnel.
- Carbon emissions associated with transportation infrastructure and operations.
- Transportation emissions from commuting to and from campus for classes.

Chemical Usage:

- Usage of chemicals and hazardous substances in research experiments, laboratory procedures, and teaching activities.
- Cleaning and maintenance chemicals used for laboratory equipment, facilities, and classrooms.
- Proper handling, storage, and disposal of chemicals to minimize environmental impact.
- Chemical usage in teaching laboratories and practical sessions.

Land Use:

- Construction activities related to building expansion, renovation, or infrastructure development for academic facilities.
- Landscaping practices for maintaining green spaces, gardens, and outdoor areas.
- Preservation of natural habitats and biodiversity within campus boundaries.
- Land use for classroom buildings, lecture halls, and academic facilities.

Research Outputs:

- Environmental impact of research projects, including emissions, resource consumption, and waste generation.
- Contributions to sustainable energy technologies, renewable energy solutions, and environmental conservation practices.
- Dissemination of research findings through publications, conferences, and knowledge-sharing platforms.

By identifying and managing these environmental aspects, academic institutions can minimize negative impacts on the environment while promoting sustainability, energy efficiency, and responsible educational practices.

Q9. Legal and compliance obligations

What are the legal and other compliance obligations related to the environment that our campus needs to adhere to, and how can we ensure continuous compliance?

Understanding compliance obligations related to the environment is essential for ensuring that the campus meets legal requirements and other regulatory standards. Some key compliance obligations include:

- Environmental Regulations: Compliance with local, national, and international environmental regulations governing areas such as air quality, water quality, waste management, and environmental impact assessments.
- Permits and Licenses: Obtaining and maintaining permits and licenses required for specific activities, such as operating equipment, handling hazardous materials, or conducting research projects with environmental implications.
- Reporting Requirements: Fulfilling obligations to report environmental data, emissions, waste generation, and other relevant information to regulatory agencies, government bodies, or industry authorities.
- Environmental Standards: Adhering to voluntary standards, certifications, or industry best practices related to environmental management, sustainability, and energy efficiency.
- Stakeholder Expectations: Meeting the expectations of stakeholders, including students, faculty, staff, local communities, and environmental advocacy groups, regarding environmental stewardship and sustainability initiatives.

To ensure continuous compliance with these obligations, the following measures can be implemented:

- Regular Compliance Audits: Conducting periodic audits to assess environmental compliance status, identify gaps or non-conformities, and take corrective actions to address any issues.
- Staff Training and Awareness: Providing comprehensive training and awareness programs to staff, faculty, and students to ensure they understand their roles and responsibilities in maintaining compliance with environmental regulationsand standards.
- Document Management: Establishing robust systems for documenting permits, licenses, regulatory requirements, and compliance activities to ensure transparency, accountability, and accessibility of relevant information.
- Monitoring and Reporting: Implementing monitoring programs to track environmental performance indicators, such as energy consumption, waste generation, and emissions, and preparing regular reports to demonstrate compliance with regulatory requirements.
- Continuous Improvement: Establishing mechanisms for continuous improvement of environmental management practices, including setting environmental objectives and targets, implementing corrective and preventive actions, and reviewing performance against established goals.

By proactively identifying and understanding compliance obligations and implementing effective management practices, our campus can ensure ongoing adherence to environmental regulations and standards while demonstrating a commitment to environmental responsibility and sustainability.

Q10. Identifications and Evaluation of Environmental risks and opportunities

How can we identify and evaluate environmental risks and opportunities associated with our campus operations, and what framework should we use for this process?

Identifying and evaluating environmental risks and opportunities associated with campus operations can be systematically approached. Focusing on the SWOT analysis aspect for identifying and evaluating environmental risks and opportunities associated with campus operations involves examining internal strengths and weaknesses, as well as external opportunities and threats, related to environmental aspects. This approach encourages a strategic perspective on environmental management, ensuring efforts are well-informed, focused, and aligned with broader campus sustainability goals.

Strengths:

- Internal Resources: Identify resources like committed staff, financial resources, and existing green infrastructure that can support environmental initiatives.
- Current Programs and Initiatives: Evaluate the effectiveness of existing environmental programs and how they can be leveraged.

Weaknesses:

- Areas Lacking Efficiency: Pinpoint operations where resource use is high or waste generation is significant.
- Knowledge Gaps: Determine if there are areas where staff and students lack awareness or expertise in sustainable practices.

Opportunities:

- Technological Advances: Explore new technologies or practices that can reduce environmental impact.
- Partnerships: Look for potential collaborations with local organizations, businesses, or other institutions to enhance environmental initiatives.

Threats:

- Regulatory Changes: Keep abreast of changes in environmental regulations that might impact campus operations.
- Environmental Risks Specific to Location: Consider risks such as susceptibility to climate change effects, pollution, or biodiversity loss that could affect the campus.

Implementing the SWOT Analysis:

- Gather a Diverse Team: Include representatives from different areas of campus operations to ensure a comprehensive analysis.
- Conduct Research: Collect data on energy consumption, waste production, water usage, etc., to inform your analysis.
- Engage Stakeholders: Get input from students, staff, and external stakeholders to identify strengths, weaknesses, opportunities, and threats.
- Analyze Findings: Evaluate the information to identify critical environmental risks and opportunities.
- Develop Strategies: Based on the SWOT analysis, formulate strategies to address weaknesses, mitigate threats, and capitalize on strengths and opportunities.
- Benefits of Using SWOT for Environmental Management:
- Holistic Understanding: Provides a comprehensive view of the environmental landscape of the campus.
- Informed Decision-Making: Helps in making strategic decisions that align with the campus's environmental goals and capabilities.
- Stakeholder Engagement: Engages the campus community in environmental stewardship, raising awareness and participation.
- Adaptability: Offers flexibility to adapt strategies as internal and external environmental factors change.

Q11. Strategies to identify the environmental risks and opportunities

What strategies can we develop to address the identified environmental risks and opportunities, and how should we prioritize these actions?

To address environmental risks and opportunities within the academic context, institutions can adopt a structured approach to develop and prioritize actions. This approach encompasses leveraging strengths and opportunities to mitigate weaknesses and threats, thereby fostering a more sustainable and environmentally responsible academic environment. Here's a general framework that can be applied across academia:

Developing Strategies:

1. Integrate EMS Principles into Curriculum and Research:

Strategy: Embed environmental management and sustainability concepts into courses and research projects to cultivate an environmentally conscious culture among students and faculty.

Rationale: Education and research are core functions of academic institutions; integrating EMS principles can have a wide-reaching impact on students' and researchers' approach to environmental stewardship.

2. Optimize Resource Use and Reduce Waste:

Strategy: Implement resource optimization initiatives, such as energy conservation measures, waste reduction programs, and water-saving technologies.

Rationale: Academic institutions often have significant energy and water footprints. Optimizing these resources can lead to substantial environmental and financial benefits.

3. Leverage Technological Advancements:

Strategy: Adopt and invest in cutting-edge technologies and practices that enhance environmental performance, such as renewable energy systems, green building technologies, and virtualization of resources.

Rationale: Technology can play a pivotal role in improving environmental sustainability. Staying abreast of technological advancements can position an institution as a leader in sustainability.

4. Foster Partnerships for Sustainability:

Strategy: Engage in partnerships with government bodies, industry, and other educational institutions to collaborate on sustainability projects and share best practices.

Rationale: Collaborative efforts can amplify the impact of sustainability initiatives and provide additional resources and expertise.

5. Establish Continuous Monitoring and Improvement Processes:

Strategy: Implement a system for ongoing monitoring of environmental performance against established benchmarks, with regular reviews to identify areas for improvement.

Rationale: Continuous improvement is a core principle of EMS. Regular monitoring and review ensure that the institution remains aligned with its environmental goals and can adapt to new challenges and opportunities.

Prioritizing Actions:

- Assess Impact and Feasibility: Prioritize actions based on their potential environmental impact and the feasibility of implementation, considering available resources and institutional capabilities.
- Align with Strategic Goals: Ensure that the prioritized actions align with the institution's broader strategic goals and objectives, including educational, research, and community engagement goals.
- Engage Stakeholders: Involve stakeholders, including students, faculty, staff, and external partners, in the prioritization process to ensure buy-in and support for sustainability initiatives.
- Consider Urgency and Regulatory Requirements: Give precedence to actions that address urgent environmental issues or are required to comply with environmental regulations and standards.
- Plan for Quick Wins and Long-term Goals: Balance the portfolio of actions to include both "quick wins" that can demonstrate immediate benefits and long-term initiatives that will yield significant environmental improvements over time.

By developing and prioritizing strategies in this manner, academic institutions can effectively address environmental risks and opportunities, enhancing their sustainability performance and contributing to global environmental goals.

Q11. Establishment of measurable environmental objectives

How can we establish measurable environmental objectives that align with our environmental policy and what steps are needed to achieve these objectives?

Establishing measurable environmental objectives that align with an institution's environmental policy involves a structured approach. Here's a general guide that can be adapted to the specific needs and context of an academic institution or research group:

1. Understand the Environmental Policy:

Action: Thoroughly review the environmental policy to ensure a deep understanding of its commitments, principles, and overall direction.

Purpose: The objectives should directly support the goals outlined in the environmental policy, ensuring consistency and alignment with the institution's environmental values and commitments.

2. Conduct an Environmental Aspect and Impact Assessment:

Action: Identify and assess the environmental aspects of the institution's operations, activities, and services that it can control or influence, and determine their impact.

Purpose: This assessment helps in pinpointing areas where the institution can make significant environmental improvements, serving as a foundation for setting objectives.

3. Engage Stakeholders:

Action: Involve a range of stakeholders, including faculty, students, staff, and external partners, in setting objectives.

Purpose: Stakeholder engagement ensures that the objectives are realistic, achievable, and supported by the community, enhancing commitment and participation.

4. Set SMART Objectives:

Action: Develop Specific, Measurable, Achievable, Relevant, and Time-bound (SMART) objectives based on the environmental aspects and impacts assessment.

Purpose: SMART objectives provide clarity and focus, making it easier to monitor progress and achieve meaningful environmental improvements.

5. Define Key Performance Indicators (KPIs):

Action: For each objective, define clear KPIs that will be used to measure progress.

Purpose: KPIs enable the institution to quantitatively assess how well it is meeting its environmental objectives, facilitating regular monitoring and reporting.

6. Develop an Implementation Plan:

Action: Create detailed action plans for achieving each objective, including assigning responsibilities, resources, and timelines.

Purpose: An implementation plan provides a roadmap for action, detailing the steps needed to achieve the objectives and ensuring accountability.

7. Implement, Monitor, and Review:

Action: Implement the action plans, regularly monitor progress against the KPIs, and review the effectiveness of the objectives and their implementation.

Purpose: Continuous monitoring and review allow the institution to adjust its strategies as needed to ensure the objectives are met and to continuously improve environmental performance.

8. Communicate Progress:

Action: Regularly communicate progress towards the environmental objectives to all stakeholders.

Purpose: Transparent communication fosters a culture of sustainability, encourages participation, and demonstrates the institution's commitment to environmental improvement.

Example Objectives for Academia:

Q12. Environmental Objectives for Academia – Sample

Environmental Objective	Target	Strategy to Achieve Objective
Reduce Campus Energy Consumption	By X% within Y years	Implement energy efficiency upgrades and renewable energy projects across campus facilities.
Increase Recycling Rates	Achieve a recycling rate of X% by Y year	Improve recycling facilities and conduct awareness campaigns to encourage recycling among students and staff.
Enhance Sustainable Transportation	Increase the use of public transportation, cycling, and walking by X% among students and staff by Y year	Develop partnerships and incentives to promote the use of sustainable transportation options.

Annex 2 - Completed Questionnaire of each University

Frederick University Responses

Gap Analysis of Environmental Concerns and Current Status Across Stakeholder Groups at Frederick University

Stakeholder Group	Primary Environmental Concerns	Current Status at Frederick University	Gap Analysis
Students	- Sustainability practices - Waste management - Energy efficiency - Environmental education and activism	- Some recycling programs in place - Limited energy-saving initiatives - Minimal environmental education opportunities for students	- Lack of comprehensive sustainability practices - Inadequate waste management systems - Limited energy efficiency measures - Need for expanded environmental education programs
Staff	- Workplace sustainability - Energy use - Waste management - Transportation options	- Basic recycling bins available - Moderate efforts to reduce energy consumption - Minimal transportation incentives for staff	- Insufficient focus on workplace sustainability - Opportunities for improving energy efficiency - Need for enhanced waste management strategies - Lack of transportation incentives
Surrounding Community	- Pollution - Noise - Traffic congestion - Land use - Environmental footprint	- Efforts to reduce emissions and waste - Limited community engagement initiatives - Moderate environmental impact assessment	- Potential concerns regarding pollution and noise - Limited measures to address traffic congestion - Opportunities for enhanced community engagement - Need for comprehensive environmental impact assessments
Research Community	- Environmental conservation - Biodiversity - Climate change adaptation - Sustainable development	- Some research projects related to environmental conservation - Limited emphasis on biodiversity and climate change adaptation - Moderate focus on sustainable development	- Opportunities for expanding research on environmental conservation - Need for increased emphasis on biodiversity and climate change adaptation - Potential for enhancing research in sustainable development

Key Observations:

1. Students:

There is a significant gap in comprehensive sustainability practices, waste management, energy efficiency, and environmental education opportunities.

2. Staff:

Workplace sustainability needs more attention, along with initiatives to reduce energy consumption and enhance waste management. Transportation incentives for staff are lacking.

3. Surrounding Community:

While efforts to reduce emissions and waste exist, more engagement with the community is needed. Additionally, there's potential for addressing concerns like pollution, noise, and traffic congestion.

4. Research Community:

Research on environmental conservation is present but needs expansion. Biodiversity and climate change adaptation research require more emphasis. Sustainable development research could be enhanced.

Overview of the Environmental Scope in Frederick University Campus Operations

Environmental Scope	**Description**
Functions	- Educational activities (teaching, research, academic programs) - Administrative functions (management, operations, support services) - Recreational and cultural activities (sports events, cultural programs)
Physical Boundaries	- Campus buildings (academic buildings, administrative offices, laboratories, dormitories, recreational facilities) - Grounds and landscaping (green spaces, lawns, gardens) - Transportation infrastructure (parking lots, roads, walkways)
Activities	- Energy consumption (heating, cooling, lighting, electricity usage) - Water usage (drinking, irrigation, wastewater) - Waste generation (solid waste, recycling, hazardous waste) - Transportation

	(commuting, vehicle use) - Chemical usage (laboratories, cleaning, maintenance) - Land use (construction, landscaping)
Products and Services	- Educational programs and courses - Research outputs and publications - Support services (food, printing, maintenance)

Consequently, the table below, demonstrates the environmental scope of the Sustainable Energy Research Group (SERG) at Frederick University.

Overview of Environmental Scope of the Sustainable Energy Research Group (SERG) at Frederick University

Environmental Aspect	**Description**
Functions	- Research activities
	- Administrative functions (management, support services)
Physical Boundaries	- Campus buildings (academic buildings, administrative offices, laboratories)
	- Transportation infrastructure (parking lots, roads, walkways)
Activities	- Energy consumption (heating, cooling, lighting, electricity usage)
	- Water usage (drinking, wastewater)
	- Waste generation (solid waste, recycling, hazardous waste)
	- Transportation (commuting, vehicle use)
	- Chemical usage (laboratories, cleaning, maintenance)
Products and Services	- Research activities
	- Research outputs and publications
	- Support services (food, printing, maintenance)

In September 2023, Frederick University initiated a gap analysis as part of its journey towards adopting an Environmental Management System (EMS). A follow-up analysis was conducted in March 2024 to track progress and identify remaining gaps. Through strategic efforts, we devised targeted actions to address identified deficiencies. These steps included bolstering leadership commitment, forming a dedicated EMS team, refining environmental policies, setting clear objectives, implementing procedures, enhancing staff training, improving communication, refining monitoring systems, and ensuring comprehensive documentation.

While an EMS is not yet in place, these actions signify significant strides towards fostering environmental sustainability at Frederick University.

Gap Analysis of Environmental Concerns and Current Status Across Stakeholder Groups at Frederick University – Sustainable Energy Research Group

Implementation Step	Current Status at Frederick University	Gap Analysis (September 2023)	Gap Analysis Addressed (March 2024)
Leadership Commitment	- Some support from senior management, but full commitment not demonstrated	- Lack of clear endorsement and allocation of resources for EMS implementation	- Enhanced endorsement from senior management, with clear allocation of resources for EMS implementation (See Annexes – MoM SERG QMS Review Meeting)
Establish an EMS Team	- No dedicated EMS team in place	- Need to form a cross-functional EMS team with representation from key departments and stakeholders	- Cross-functional EMS team formed with representation from key departments and stakeholders (See Annexes – Detachment from EMS)
Conduct an Initial Environmental Review	- Limited environmental assessments conducted	- Lack of comprehensive understanding of campus environmental aspects and impacts, highlighting the need for an in-depth review	- Comprehensive environmental review conducted, providing a thorough understanding of campus environmental aspects and impacts (See Section 2, Environmental Scope)
Develop an Environmental Policy	- No formal environmental policy in place	- Absence of a clear and formalized commitment to environmental stewardship and sustainability goals	- Formal environmental policy drafted and implemented, aligning with organizational values and sustainability goals (See Section 4, Environmental Policy)
Define Environmental Objectives and Targets	- No defined environmental objectives and targets	- Lack of specific goals and targets for addressing identified environmental issues and driving continual improvement	- Measurable environmental objectives and targets established, addressing identified environmental issues and driving continual

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			improvement (See Section 10, Environmental Objectives)
Establish Procedures and Controls	- Informal procedures and controls for environmental management	- Need to formalize documented procedures and controls to effectively manage environmental aspects and impacts	- Documented procedures and controls formalized, enabling effective management of environmental aspects and impacts (See Annexes, relevant procedures)
Raise Awareness and Train Personnel	- Limited awareness and training programs on environmental management	- Opportunities for improving staff and student engagement through targeted training and awareness initiatives	- Enhanced training and awareness initiatives implemented, improving staff and student engagement in environmental management (See Annexes, Training Programme)
Implement Communication Channels	- Informal communication channels for environmental matters	- Need for formalized channels to facilitate internal and external communication, feedback, and reporting on environmental issues	- Formalized communication channels established, facilitating internal and external communication, feedback, and reporting (See Annexes, Social Media Monthly Calendar)
Monitor and Measure Performance	- Limited monitoring and measurement of environmental performance	- Lack of systematic approach to tracking key environmental indicators, hindering the ability to assess progress and identify areas for improvement	- Systematic monitoring and measurement systems implemented, enabling tracking of key environmental indicators (See Annexes, relevant procedures)
Document EMS Documentation	- Minimal documentation of EMS procedures and records	- Absence of comprehensive documentation to support EMS implementation and ensure transparency and accountability	- Comprehensive documentation of EMS procedures and records established, ensuring transparency and accountability

Gap Analysis of Environmental Concerns and Current Status Across Stakeholder Groups

Step	Frederick University's Consideration for SERG
1. Policy Review	Reviewed existing institutional policies to ensure alignment with SERG's research focus and sustainability objectives.
2. Stakeholder Engagement	Engaged SERG researchers, faculty, and students in workshops and meetings to gather input on environmental priorities and values.
3. Defining Policy Principles	Developed policy principles specifically tailored to SERG's research activities and commitment to sustainable energy solutions.
4. Formulating Policy Statements	Drafted policy statements outlining SERG's goals to reduce carbon footprint, promote renewable energy, and minimize environmental impact.
5. Seeking Stakeholder Input	Conducted surveys and focus groups to gather feedback from SERG members on the clarity and feasibility of the drafted policy statements.
6. Finalizing and Approving Policy Statement	Incorporated stakeholder feedback into the final policy statement and obtained approval from SERG leadership and university governance.
7. Communicating and Implementing	Distributed the approved policy statement to all SERG members and communicated roles and responsibilities for its implementation.
8. Monitoring and Reviewing	Established regular review processes to assess the effectiveness of the policy statement in guiding SERG's research practices and outcomes.

Environmental Policy Statement – Frederick University, Sustainable Energy Research Group

The Environmental Policy Statement for the Sustainable Energy Research Group at Frederick University is the following:

"At the Sustainable Energy Research Group (SERG) of Frederick University, we are dedicated to advancing research in sustainable energy solutions while minimizing our environmental impact. We pledge to conduct our research with a commitment to environmental conservation and sustainability. This includes reducing energy consumption, promoting renewable energy sources, and minimizing waste generation throughout our research activities. Through

collaboration, innovation, and responsible practices, SERG strives to contribute positively to a greener and more sustainable future for our community and beyond."

The following table presents the structured roles and responsibilities within the Environmental Management System (EMS) framework tailored specifically for the Sustainable Energy Research Group (SERG) at Frederick University.

Roles and Responsibilities in Environmental Management System (EMS) Structure for SERG

Role	Description
Environmental Management Committee (EMC)	Composition: Includes the SERG academic advisor, SERG Quality Manager (QM), and SERG Environmental Management Representative (EMR).
Environmental Management Representative (EMR)	Role: Ms. Evi Demetriou, Environmentalist, designated individual responsible for coordinating EMS activities within SERG.
Departmental Environmental Coordinators	Not applicable for SERG as there are no departmental coordinators within SERG.
Cross-Functional Teams	Composition: Members from SERG, University health and safety team, and facility management team..
Authorities and Delegated Responsibilities	Academic Supervisor of SERG takes decisions within the EMS structure.

Environmental Aspects. Sustainable Energy Research Group, Frederick University

Environmental Aspect	Description
Energy Consumption	- Heating, cooling, and lighting of research laboratories, academic buildings and administrative offices. - Electricity usage for equipment, computers, and research facilities. - Energy consumption associated with experimental setups.
Water Usage	- Drinking water consumption in laboratories and offices. - Wastewater generation from research activities, cleaning processes, and laboratory experiments.

Waste Generation	- Solid waste generated from research materials, packaging, and office activities. - Recycling activities for paper, plastic, glass, and other recyclable materials. - Hazardous waste generation from laboratory experiments, chemical usage, and disposal.
Transportation	- Commuting-related emissions from faculty and staff traveling to and from campus for classes and research. - Vehicle use for transportation of research equipment, materials, and personnel. - Carbon emissions associated with transportation infrastructure and operations.
Chemical Usage	- Usage of chemicals and hazardous substances in research experiments, laboratory procedures, and teaching activities. - Cleaning and maintenance chemicals used for laboratory equipment, facilities, and classrooms. - Proper handling, storage, and disposal of chemicals to minimize environmental impact.
Research Outputs	- Environmental impact of research projects, including emissions, resource consumption, and waste generation. - Contributions to sustainable energy technologies, renewable energy solutions, and environmental conservation practices. - Dissemination of research findings through publications, conferences, and knowledge-sharing platforms.

The table below outlines the key pieces of legislation and principles that could affect the operation of the Sustainable Energy Research Group at Frederick University, focusing on environmental impact assessments, waste management, energy and pollution control, and public access to environmental information.

Legal Compliance. Sustainable Energy Research Group, Frederick University

Legislation/Principle	**Description**	**Relevance to SERG Operations**
Environmental Impact Assessment of Certain Works Act 2018 (Law 127(I)/2018)	Requires Environmental Impact Assessments (EIA) for large-scale projects to assess and mitigate potential environmental effects.	Universities planning large-scale construction or renovation projects must conduct EIAs to ensure environmental protection
Extended Producer Responsibility (EPR) Principle (Packaging and Packaging Waste Law L.32(I)/2002 and Waste Management Law of 2011 L.185(I)/2011)	Mandates producers/importers to manage waste from their products, including collection and recycling.	Universities must responsibly manage various types of waste, including e-waste and hazardous waste from laboratories, and potentially participate in recycling schemes

Energy Use and Pollution Control	Covers regulations on energy efficiency, emissions, and the use of certain technologies to control pollution.	Relevant to universities with significant infrastructure, necessitating compliance with regulations on emissions, energy efficiency, and pollution control.
Public Access to Environmental Information (Law no. 33(III)/2003 and Law on Public Access to Information Related to the Environment of 2004 – No. 119(I)/2004)	Requires public authorities to provide environmental information upon request.	Public universities may need to disclose information about their environmental impact, practices, and sustainability measures to the public.
Safety and Health at Work Law of 1996 (Law 89(I)/1996) and Amendments up to 2023	Establishes a comprehensive framework for health and safety in the workplace, including risk assessment, preventive and protective measures, and a health and safety register for employers with five or more persons.	Universities must conduct risk assessments for their labs, implement necessary safety measures, and maintain a safety and health register documenting these efforts.
Law 178(I)/2015 - The Safety and Health at Work (Amendment) (No.2) Law of 2015	Clarifies obligations regarding equipment, chemical substances, and workplace suitability. Emphasizes the need for a written risk assessment and a risk management system suitable for the institution's size.	Highlights the importance of selecting appropriate equipment and chemicals in university labs and implementing a tailored risk management system.
National Strategy for Safety and Health at Work (2013 – 2020)	Sets priorities for improving safety and health at work, promoting a safety culture, and integrating safety and health issues into education and training.	Encourages universities to foster a safety culture within labs, integrate safety and health issues into curriculums, and engage with national safety and health initiatives.

The SWOT assessment for an implementing an EMS at Frederick University and its Sustainable Energy Research Group (SERG), highlights that while SERG is well-positioned to benefit from adopting an EMS, due to its strong foundation in sustainable research and quality standards, it must also navigate potential challenges related to resources and ongoing compliance. The opportunities presented by enhanced reputation, potential funding, and educational integration can significantly outweigh the threats with careful planning and management.

Strengths:

- Accredited Quality Standards: SERG's operation under ISO 9001:2015 standards indicates a strong foundation for adopting an EMS.
- Dedicated Research Infrastructure: Existing labs and equipment for sustainable energy research can facilitate environmental management practices.
- Expertise in Sustainable Energy: The group's focus on sustainable energy technologies and building physics aligns well with the principles of an EMS.

Weaknesses:

- Resource Constraints: Implementing an EMS might require additional resources, including time and financial investment, which could strain existing resources.
- Adaptation to EMS Requirements: The need to align current operations and research activities with EMS standards could present challenges.

Opportunities:

- Enhanced Reputation: Adopting an EMS could further bolster SERG's image as a leader in sustainable research and education.
- Funding Opportunities: Demonstrating commitment to environmental management might open up new avenues for funding and collaboration.
- Educational Integration: The EMS could serve as a practical example for students, integrating real-world environmental management into the curriculum.

Threats:

- Regulatory and Compliance Risks: Changes in environmental regulations could necessitate ongoing adjustments to the EMS, requiring continuous monitoring and adaptation.
- Technological Advancements: Keeping the EMS current with the latest sustainable technologies and practices may require frequent updates and investments.

SWOT Assessment for adopting EMS at Frederick University, Sustainable Energy Research Group

Strengths	**Opportunities**
Accredited Quality Standards	Enhanced Reputation
Dedicated Research Infrastructure	Funding Opportunities
Expertise in Sustainable Energy	Educational Integration
Weaknesses	**Threats**

Resource Constraints	Regulatory and Compliance Risks
Adaptation to EMS Requirements	Technological Advancements

Developing Strategies:

6. Integrate EMS Principles into Curriculum and Research:

Strategy: Embed environmental management and sustainability concepts into courses and research projects to cultivate an environmentally conscious culture among students and faculty.

Rationale: Education and research are core functions of academic institutions; integrating EMS principles can have a wide-reaching impact on students' and researchers' approach to environmental stewardship.

7. Optimize Resource Use and Reduce Waste:

Strategy: Implement resource optimization initiatives, such as energy conservation measures, waste reduction programs, and water-saving technologies.

Rationale: Academic institutions often have significant energy and water footprints. Optimizing these resources can lead to substantial environmental and financial benefits.

8. Leverage Technological Advancements:

Strategy: Adopt and invest in cutting-edge technologies and practices that enhance environmental performance, such as renewable energy systems, green building technologies, and virtualization of resources.

Rationale: Technology can play a pivotal role in improving environmental sustainability. Staying abreast of technological advancements can position an institution as a leader in sustainability.

9. Foster Partnerships for Sustainability:

Strategy: Engage in partnerships with government bodies, industry, and other educational institutions to collaborate on sustainability projects and share best practices.

Rationale: Collaborative efforts can amplify the impact of sustainability initiatives and provide additional resources and expertise.

10. Establish Continuous Monitoring and Improvement Processes:

Strategy: Implement a system for ongoing monitoring of environmental performance against established benchmarks, with regular reviews to identify areas for improvement.

Rationale: Continuous improvement is a core principle of EMS. Regular monitoring and review ensure that the institution remains aligned with its environmental goals and can adapt to new challenges and opportunities.

Prioritizing Actions:

- Assess Impact and Feasibility: Prioritize actions based on their potential environmental impact and the feasibility of implementation, considering available resources and institutional capabilities.
- Align with Strategic Goals: Ensure that the prioritized actions align with the institution's broader strategic goals and objectives, including educational, research, and community engagement goals.
- Engage Stakeholders: Involve stakeholders, including students, faculty, staff, and external partners, in the prioritization process to ensure buy-in and support for sustainability initiatives.
- Consider Urgency and Regulatory Requirements: Give precedence to actions that address urgent environmental issues or are required to comply with environmental regulations and standards.
- Plan for Quick Wins and Long-term Goals: Balance the portfolio of actions to include both "quick wins" that can demonstrate immediate benefits and long-term initiatives that will yield significant environmental improvements over time.

By developing and prioritizing strategies in this manner, academic institutions can effectively address environmental risks and opportunities, enhancing their sustainability performance and contributing to global environmental goals.

Agricultural University Athens Responses

Gap Analysis of Environmental Concerns and Current Status across Stakeholder Groups at AUA Campus

Stakeholder Group	Primary Environmental Concerns	Current Status at AUA	Gap Analysis
Students	-Sustainable practices -Reduction of energy waste -Waste management	-Recycling programs for different materials -Not enough promotion for energy-saving techniques	-There are not enough collection points for recycling -Limited energy efficiency measures -Need for greater awareness of

			sustainable techniques
Staff	-Energy use efficiency at workplace -Waste management -Sustainable practices	-Available recycling points -Minimal awareness to reduce energy waste	- Need for comprehensive training programs on environmental sustainability
Surrounding Community	-Pollution -Noise -Environmental footprint	-Minimal efforts to reduce emissions and waste -Moderate knowledge of environmental impact -There are 7 other factories in the vicinity of the university that contribute to the carbon footprint	-Need for information and awareness about environmental impact -Need for better information on the sustainable actions of the university
Research Community	-Conservation of biodiversity in campus -Climate change adaptation -Better assessment of problems for better treatment	- Several programs on sustainability and best eco-friendly techniques -Recycling several different materials	-Need for a wider range of recycling in the university community - Need for increased emphasis on biodiversity and climate change adaptation

Overview of Environmental Scope of the AUA Campus

Environmental Aspect	**Description**

Functions	-Research activities -Practical application of laboratory courses -Recreational activities -Organization of events -Conferences
Physical Boundaries	-Roads -Buildings -Fences -Livestock units -Parking lots -Pitches -Gardens –Vineyards - -Greenhouses -Walkways -Recreational areas
Activities	-Energy consumption (heating buildings, livestock units, greenhouses, cooling, electricity usage) -Energy production (photovoltaic panels) -Water usage -Chemical usage -Recycling (chemicals, paper, plastic, clothing, batteries, plastic bottles and caps, metals, biowaste) -Organic waste -Composting units
Products and Services	-Research activities -Publications and research findings

	-Production of dairy products, eggs, honey, wine -Manufacturing bioplastics (membranes, etc.) from the waste of the oenology laboratory

Gap Analysis of Environmental Concerns and Current Status Across Stakeholder Groups at AUA Campus

Implementation Step	**Current Status at AUA Campus**	**Gap Analysis (April 2023)**
Leadership Commitment	Approval of green actions by the relevant vice-chancellor	N/A
Establish an EMS Team	There is an Environmental Management office at AUA	N/A
Conduct an Initial Environmental Review	N/A	N/A
Develop an Environmental Policy	Integration of the 17 Goals of the UN for Sustainable Development in GPA operations.	N/A
Define Environmental Objectives and Targets	Integration of the 17 Goals of the UN for Sustainable Development in GPA operations.	N/A
Establish Procedures and Controls	the technical service and the environmental management department deal with these problems	N/A
Raise Awareness and Train Personnel	Awareness-raising activities are carried out through conferences, announcements on the university website, announcements of study results, etc.	N/A

Implement Communication Channels	Through announcements to the university community	N/A
Monitor and Measure Performance	Records are made but for the entire campus and not for specific structures	A more personalized study could be done, but appropriate sensors and specialized personnel are needed
Document EMS Documentation	There is some documentation of procedures	Comprehensive documentation of EMS procedures and records established

Roles and Responsibilities in Environmental Management System (EMS) Structure for AUA Campus

Role	**Description**
Environmental Management Committee (EMC)	Department of environmental management
Environmental Management Representative (EMR)	The team of the environmental management department and the technical service
Departmental Environmental Coordinators	N/A
Cross-Functional Teams	N/A
Authorities and Delegated Responsibilities	Technical service and the responsible vice chancellor

Environmental Aspects. AUA Campus

Environmental Aspect	**Description**
Energy Consumption	-Heating, cooling and lighting of teaching rooms, research laboratories, greenhouses, farms, offices etc.

	-Electricity usage for equipment and facilities.
Water Usage	-Drinking water, irrigation for campus, irrigation for greenhouses and experiments, water usage for livestock units, cleaning, waste water from experiments, water use by the restaurant.
Waste Generation	-Solid waste (paper and other materials) -Chemical waste (research and educational activity) -Plastic waste -Organic waste (from livestock units or research activities with microorganisms, oenology laboratory, cheese factory, apiary)
Transportation	Emissions related to transportation of students, academic staff, transport, vehicles for collecting recyclable materials
Chemical Usage	-Usage of chemicals and hazardous substances in research experiments, laboratory procedures, and teaching activities. -Cleaning and maintenance chemicals used for laboratory equipment, facilities, and classrooms. -Proper handling, storage, and disposal of chemicals to minimize environmental impact.
Research Outputs	-Environmental impact of research projects, including emissions, resource consumption, and waste generation. -Contributions to sustainable energy technologies, renewable energy solutions, and environmental conservation practices. -Dissemination of research findings through publications, conferences, and knowledge-sharing platforms.
Env Aspect	N/A

Legal Compliance. AUA Campus

Legislation/Principle	**Description**	**Relevance to AUACampus Operations**

Environmental Impact Assessment of Certain Works Act 2018 (Law 127(I)/2018)	Requires Environmental Impact Assessments (EIA) for large-scale projects to assess and mitigate potential environmental effects.	Universities planning large-scale construction or renovation projects must conduct EIAs to ensure environmental protection
Extended Producer Responsibility (EPR) Principle (Packaging and Packaging Waste Law L.32(I)/2002 and Waste Management Law of 2011 L.185(I)/2011)	Mandates producers/importers to manage waste from their products, including collection and recycling.	Universities must responsibly manage various types of waste, including e-waste and hazardous waste from laboratories, and potentially participate in recycling schemes
Energy Use and Pollution Control	Covers regulations on energy efficiency, emissions, and the use of certain technologies to control pollution.	Relevant to universities with significant infrastructure, necessitating compliance with regulations on emissions, energy efficiency, and pollution control.
Public Access to Environmental Information (Law no. 33(III)/2003 and Law on Public Access to Information Related to the Environment of 2004 – No. 119(I)/2004)	Requires public authorities to provide environmental information upon request.	Public universities may need to disclose information about their environmental impact, practices, and sustainability measures to the public.
Safety and Health at Work Law of 1996 (Law 89(I)/1996) and Amendments up to 2023	Establishes a comprehensive framework for health and safety in the workplace, including risk assessment, preventive and protective measures, and a health and safety register for employers with five or more persons.	Universities must conduct risk assessments for their labs, implement necessary safety measures, and maintain a safety and health register documenting these efforts.
Law 178(I)/2015 - The Safety and Health at Work (Amendment) (No.2) Law of 2015	Clarifies obligations regarding equipment, chemical substances, and workplace suitability. Emphasizes the need for a written risk assessment and a risk	Highlights the importance of selecting appropriate equipment and chemicals in university labs and

	management system suitable for the institution's size.	implementing a tailored risk management system.
National Strategy for Safety and Health at Work (2013 – 2020)	Sets priorities for improving safety and health at work, promoting a safety culture, and integrating safety and health issues into education and training.	Encourages universities to foster a safety culture within labs, integrate safety and health issues into curriculums, and engage with national safety and health initiatives.

SWOT Assessment for adopting EMS at AUA Campus

Strengths	**Opportunities**
Recycling practices are already in place	Increasing the volume of recycling and the availability of collection points
Expertise in Sustainable Energy	Funding Opportunities
Already existing research programs for sustainable techniques	Dissemination and information of the citizens - increasing the awareness of the society
	Good training of students to apply environmentally friendly techniques
Weaknesses	**Threats**
Adaptation to EMS Requirements	Regulatory and Compliance Risks
Resource Constraints	N/A
Management authorities that collect recyclable materials often change, causing collection-accumulation problems	N/A

Environmental Objectives for Academia – at AUA Campus

Environmental Objective	Target	Strategy to Achieve Objective
Reduce Campus Energy Consumption	Difficult to determine a rate	Better use of equipment, shutdown of machines and heat pumps when not needed, reduction of thermal losses of buildings by use of thermal insulation
Increasing recycling rates	Difficult to determine a rate	Increase of collection points, small bins in offices, awareness of staff and students, promotion of action through announcements
Increase in energy production	Difficult to determine a rate	Increase of photovoltaic panels in the campus spaces
Enhance Sustainable transportation	Increase the use of public transportation, cycling, and walking	There is already an electric van and bicycles for transportation within the campus

Klaipeda University Responses

Gap Analysis of Environmental Concerns and Current Status Across Stakeholder Groups at Klaipeda University Campus

Stakeholder Group	Primary Environmental Concerns	Current Status at Klaipeda University	Gap Analysis
Students	Sustainable study; Waste management; Energy efficiency; Water consumption; Environmental	Limited recycling programs in place; Limited energy-saving initiatives; Some	Lack of comprehensive sustainability practices; Inadequate waste management systems; Limited energy efficiency

	education; Engagement in environmental actions	environmental education opportunities for students	measures; Need for environmental education practical and/or lab works.
Staff	Workplace sustainability; Energy use; Waste management; Water consumption; Transportation options	Basic recycling bins available; Moderate efforts to reduce energy and water consumption; exposure to ionized radiation; Absence of transportation incentives for staff	Insufficient focus on workplace sustainability; Opportunities for improving energy and water consumption's efficiency; Need for enhanced waste management strategies; Lack of transportation incentives
Surrounding Community	Pollution-Noise-Odour; Traffic congestion; Land use, Greening (landscaping); Environmental footprint	Efforts to reduce emissions, waste and water consumption; Limited community engagement initiatives; Limited greening; Unclear environmental impact assessment	Potential concerns regarding pollution noise and odour; Limited measures to address traffic congestion; Opportunities for unmown meadow, greening/landscaping of the surrounding; Chance to enhance community engagement; Need for comprehensive environmental impact assessments
Research Community	Environmental conservation; Ecosystem services; Biodiversity; Climate change adaptation; Sustainable energy; Sustainable resources consumption; Circular economy for raw material and waste	Some research projects related to environmental conservation and ecosystem services; Moderate emphasis on biodiversity and climate change adaptation; Some focus on sustainable development	Opportunities for expanding research on environmental conservation; Need for increased emphasis on biodiversity and climate change adaptation; Potential for enhancing research on sustainable energy and water consumption and circular economy

Overview of Environmental Scope of the Klaipeda University Campus

Environmental Aspect	Description
Functions	Educational activities (teaching, studying, research, training); Administrative functions (management, operations, control, support services); Recreational and cultural activities (sports events, cultural programs)
Physical Boundaries	Campus buildings (academic buildings, infrastructure buildings, administrative offices, laboratories, dormitories, recreational facilities); Grounds and landscaping- green spaces, lawns, square and botanic garden (outside of Campus); Transportation infrastructure (parking lots, roads, walkways, bicycle lanes)
Activities	Energy production and consumption (heating, cooling, lighting, electricity usage); Water usage (drinking, irrigation, wastewater); Waste generation (solid and liquid (in lab) waste, sorting, recycling, hazardous waste); Transportation (commuting, vehicle use) - Chemical usage (laboratories, cleaning, maintenance); Land use (construction, landscaping)
Products and Services	Educational and vocational programs and courses; Research outputs, implementation, dissemination and publications; Support services (catering, printing, maintenance, social and sport events)

Gap Analysis of Environmental Concerns and Current Status Across Stakeholder Groups at Klaipeda University Campus

Implementation Step	Current Status at Klaipeda University Campus	Gap Analysis (March 2023)
Leadership Commitment	Support from Vice-Rector for Infrastructure and development, but full	There is a need to allocate resources for the implementation of an EMS.

	commitment not demonstrated	
Establish an EMS Team	Formal dedication of EMS team (three groups) at KU	Need to form a cross-functional EMS team with representation from key departments and stakeholders
Conduct an Initial Environmental Review	Limited environmental assessments conducted	Some understanding of campus environmental aspects and impacts, highlighting the need for an in-depth review
Develop an Environmental Policy	Formal environmental policy in place	Limited actual/specific commitments to achieve comprehensive environmental management and sustainability goals
Define Environmental Objectives and Targets	Formal defined environmental objectives and targets	Limited specific goals and targets for addressing identified environmental issues and driving continual improvement
Establish Procedures and Controls	Informal procedures and controls for environmental management	Need to formalize documented procedures and controls to effectively manage environmental aspects and impacts.
Raise Awareness and Train Personnel	Limited awareness and training programs on environmental management	Opportunities for improving staff and student engagement through targeted training and awareness initiatives

Implement Communication Channels	Informal communication channels for environmental matters	Need for formalized channels to facilitate internal and external communication, feedback, and reporting on environmental issues
Monitor and Measure Performance	Limited monitoring and measurement of environmental performance	Limited approach to tracking key environmental indicators, hindering the ability to assess progress and identify areas for improvement
Document EMS Documentation	Minimal documentation of EMS procedures and records	Limited documentation to support EMS implementation and ensure transparency and accountability

Roles and Responsibilities in Environmental Management System (EMS) Structure for Klaipeda University Campus

Role	**Description**
Environmental Management Committee (EMC)	Not yet established. Possible composition: Includes KU Vice-Rector on Infrastructure and Development and the Head of an Infrastructure Department as Environmental Management Representative (EMR), Senior specialist of the infrastructure services department.
Environmental Management Representative (EMR)	Role: The Head of an Infrastructure Department designated individual responsible for coordinating EMS activities within KU.
Departmental Environmental Coordinators	The Heads of the each Faculties and Institutes
Cross-Functional Teams	Composition: KU Head of an Infrastructure Department, Heads of the Faculties and Institutes, Head of Health and Safety Department, Infrastructure Department’s management team and senior quality specialist

Authorities and Delegated Responsibilities	Vice-Rector on Infrastructure and Development takes decisions within the EMS structure.

Environmental Aspects. Klaipeda University Campus

Environmental Aspect	**Description**
Energy Consumption	Heating, cooling, and lighting of research laboratories, academic buildings and administrative offices. Electricity usage for equipment, computers, and research facilities. Energy consumption associated with experimental setups. Fuel for the KU cars' park and fleet (training ship and yacht).
Water Usage	Drinking water consumption in laboratories and offices. Wastewater generation from research activities, cleaning processes, and laboratory experiments.
Waste Generation	Solid and liquid (from lab) waste generated from research materials, packaging, and office activities. Recycling activities for paper, plastic, glass, and other recyclable materials. Hazardous waste generation from laboratory experiments, lighting, chemical usage, and disposal.
Transportation	Commuting-related emissions from faculty and staff traveling to and from Campus for classes and research. Fleet and vehicle use for transportation of research equipment, materials, and personnel. - Carbon emissions associated with fleet exploitation, transportation infrastructure and operations.
Chemical Usage	Usage of chemicals and hazardous substances in research experiments, laboratory procedures, and teaching/studying activities. Cleaning and maintenance chemicals used for laboratory equipment, facilities, and classrooms. Proper handling, storage, and disposal of chemicals to minimize environmental impact.
Research Outputs	Environmental impact of research activities, including emissions, resource consumption, and waste generation and recycling. - Contributions to sustainable energy technologies, renewable energy solutions, and environmental conservation practices. Dissemination of

	research findings through publications, conferences, and knowledge-sharing platforms.
Risks	Evaluation and prevention measures preparation for the following risks: risk of fire, risk of increasing wind or approaching squall, man overboard risk, risk of oil spills, risk of chemical risk, gas leakage.

Legal Compliance. Klaipeda University Campus

Legislation/Principle	**Description**	**Relevance to KU Campus Operations**
Law on environmental protection (Enactment date: 1992; last amendment 2024-01-01)	General Requirements for Environmental Protection regulates social relations in the field of environmental protection.	Highlights general requirements for rights and duties in preserving the biodiversity, ecological systems and landscape, ensuring a healthy and clean environment, the rational use of natural resources.
Law on Land (Enactment date: 1994 No.34-620, last amendment 2024-01-02)	Defines land usage. There are general requirements for protecting land from contamination, etc.	Highlights general requirements of rational use of land, preserving and improving the natural environment, natural and cultural heritage.
Law on the protection of ambient air (Enactment date: 1999, No. 98-2813) last amendment 2021-01-01)	Sets out general requirements for regulating air pollution. Prescribes measures to limit ambient air pollution and reduce its negative effects on human health and the environment.	Related with stationary and mobile air pollution source, usage of the type of fuel for transport (e.g. for ship, cars, etc.)

Law on Water (Enactment date: 1997, No. 104-2615, last amendment 2024-01-01)	Sets out general requirements for water protection from contamination.	Highlights the improvement water quality by implementing measures to phase out hazardous substances and to end the discharge of priority hazardous substances into water; the rational and sustainable use of water; prevent, protect and/or improve aquatic ecosystems
Law on drinking water supply and wastewater management (Enactment date: 2006, No. 82-3260, last amendment 2024-01-01)	Establishes regulation of drinking water supply and wastewater management, regulates the legal relations between water suppliers and consumers.	Highlights the drinking water supply and wastewater management.
Fire safety Law (Enactment date: 2002, No. 123-5518, last amendment 2019-01-01)	Establishes the legal basis for ensuring and organising fire safety.	Highlights the functions, rights and obligations with regard to fire safety.
Order adopting general rules on fire safety (Enactment date: 2005, No. Nr. 26-852; last amendment 2023-05-01)	Sets out the requirements for all company fire safety documentation, instructions, procedures	University must prepare documentation, instruction, requirements, etc., fire extinguishing equipment, number, maintenance and storage procedures (e.g. preventing fire risk from Air pollution from ships laboratory)
Law on Waste management (Enactment date: 1998, No. 61-1726, last amendment 2023-10-04)	The law sets out general requirements for waste prevention and management, general principles for organizing and planning waste management system.	University responsibly manage various types of waste, including electronic waste, hazardous waste and biodegradable waste (e.g. clams, worms) from laboratories and potentially participate in recycling schemes
Waste management rules (order of the Ministry of	Establishes specific procedures for the collection,	University responsibly manage various types of

Environment. Enactment date: 1997, No. 63-2065. Last amendment 2023-07-25)	storage, transport, use, disposal, accounting, identification, declaration, sorting, labelling of waste.	waste, including electronic waste, hazardous waste biodegradable waste (e.g. clams, worms) from laboratories and potentially participate in recycling schemes. Responsible KU infrastructure department
Rules on accounting and reporting of waste generation and management (order of the Ministry of Environment. Enactment date: 2011, No. No. D1-367. Last amendment 2023-11-01)	Establish procedures for waste producers and waste managers to record and report on the generation and management of waste.	University responsible for recording and reporting about various types of waste amounts, its transfer to the waste management companies.
Law on Environmental Pollution Tax (Enactment date: 1999, No. 47-1469, last amendment	Establishes the procedure and control of the payment of environmental pollution tax by carrying out economic activities and lists the rates of that	University responsible for pollution accounting and control. Accounting department responsible for declaring pollution taxes payment procedure for stationary and mobile pollution sources, packaging.
Law on chemicals and preparations (Enactment date: 2000, No. 36-987, last amendment 2020)	Sets out general requirements for chemicals producing, safety application, market supply, usage and other	Air pollution from ships laboratory, Laboratory of Marine Chemistry
Law on Environmental Impact Assessment of the Proposed Economic Activity (last amendment from 2023-0-01 No. XIV-1560, 2022-11-24)	Requires Environmental Impact Assessment (EIA) for projects, which falls under the scope - list of Annexes I and II of the Law.	University planning large-scale construction or renovation projects must conduct EIAs to ensure environmental protection.

Law on Climate Change management (Enactment date: 2009 No. XI-329, last amendment 2022-01-01)	Control of carrying out economic activities that release greenhouse gases into the atmosphere	Encourage to contribute to the reduction of the climate change
Law on renewable energy (Enactment date: 2011, XI-1375, last amendment from 2024-01-01)	Sets the ensuring sustainable development and integration of renewable energy sources into the energy system, encouraging the further development of new technologies and the consumption of the produced energy.	Encourage the use of renewable energy sources such as solar, wind or other.
Public Access to Environmental Information (Government resolution 1999 No. 1175, last amendment 2014)	Requires public authorities to provide environmental information upon request.	University may need to disclose information about their environmental impact, practices and sustainability measures to the public.
Green public procurement (National environmental strategy (Parliament resolution 2015 No. XII-1626; Order of the Ministry of Environment for description of procedures for applying environmental criteria in green procurement, 2011 No. D1-508)	Encouraging the development of green public procurement	University follows environmental protection criteria application in green procurement according to the Ministry of Environment order

SWOT Assessment for adopting EMS at the Klaipeda University Campus

Strengths	**Opportunities**
Unique marine research infrastructure of laboratory equipment, and the fleet as well as International Centre of Scientific and Study Competences in Marine Sciences have been developed. The Centre of Excellence for	The EU's strategic provisions for science and studies promote the creation of a unified space for science and studies and provide opportunities to attract students from other countries. This creates the conditions for

Coastal Sustainable Development is under creation. The Stakeholder Academy strengthens relations with authorities and responsible business.	involving more human resources and investments into EMS implementation.
The European education system has been implemented to train professionals capable of tackling the challenges posed by climate change.	There are opportunities to ensure a full-fledged transition from the mixture of management models of academic oligarchy and state bureaucracy to the New Public Management that are in line with EMS principles
The possibility of modernization of science and studies has been realized by using the Maritime Valley program's investments.	The growing need of society for lifelong learning in formal and informal ways leads to the need for new forms of education organized by universities.
Multifaceted scientific assistance is provided to national and regional management institutions and business partners. The University's income from cooperation with business has been growing for the past few years.	The integration of Lithuanian science and studies into the European Union provides prerequisites for improving the quality of higher education by assimilating the good practices of EU countries, including the EMS system’s successful operations.
Wide experience of international partnership and academic cooperation.	
Weaknesses	**Threats**
Insufficiently attractive image of the University.	Declining state funding. Funding for the training of young scientists is not increased.
Insufficient consolidation of the academic staff due to structural features and lack of teamwork that could impact the EMS effective implementation	O follow rapidly advancing technology and strict environmental regulations can be time-consuming and expensive.
The university prepares an insufficient number of doctoral students in the fields of technology that can negatively impact the development of the energy-saving and waste circular utilization	Due to the new management model of the science and study system, in which the focus is shifted from the process to the result, the influence of state institutions on universities has increased.

Unsystematic involvement of scientific and pedagogical personnel in the EMS activities	Although the long-term strategic goals of the higher education policy reflect the goals of the entire education policy - higher quality, accessibility and efficiency; however the desired result is not clear described.

Environmental Objectives for Academia – at the Klaipeda University Campus

Environmental Objective	Target	Strategy to Achieve Objective
Reduce Campus Electricity Consumption	4% reduction in electricity consumption within 3 years	Implement centricity efficiency actions and renewable energy projects across campus facilities.
Reduce Campus Heating Energy Consumption	5% reduce heat energy consumption within 3 years	Implement heating energy efficiency actions and renewable energy projects across campus facilities.
Reduce Campus water consumption	3% water consumption within 3 years	Develop water resources actions plan and its implementation strategy
Reduce Campus material consumption	Reduce paper consumption by 7 percent within 3 years (starting year is 2023)	Assessment of the paper consumption and its saving plan. Evaluation of transfer of paper records to electronic media and storage options.

La Rochelle University Responses

Gap Analysis of Environmental Concerns and Current Status Across Stakeholder Groups at La Rochelle Université Campus

Stakeholder Group	Primary Environmental Concerns	Current Status at La Rochelle Université	Gap Analysis

Students	Sustainability practices - Waste management - Energy efficiency – Student engagement - commuting	Efficient recycling practices – Raise awareness of energy saving, investments in energy saving process- student association and student engagement support and reward – communication about sustainable transports	Sustainability practice have to be explained regularly (recycling, energy saving, sustainable commuting) – Need to increase the environmental education programs
Staff	Workplace sustainability - Energy use - Waste management – commuting – purchasing – Awareness about sustainability	Efficient recycling practices – Raise awareness of energy saving, investments in energy saving process- communication about sustainable transports and financial incentives if a sustainable transportation is used- sustainable purchasing criteria - development of professional training about climate change	Sustainability practice have to be explained regularly (recycling, energy saving, sustainable commuting) – Need to increase professional training and adapt them to the different activities in the University
Surrounding Community	Pollution - Noise - Traffic congestion - Land use - Environmental footprint	Cooperation with the local authorities about commuting, cycling, waste…	Good cooperation, need to be carry on
Research Community	Environmental conservation - Biodiversity - Climate change adaptation - Sustainable development – transportations for conferences	Research project focused on SmUCS – reflexion about the impact of research project (transportation, purchases…)	Need to take the decision to reduce the carbon footprint of research

Overview of Environmental Scope of the La Rochelle Université Campus

The table below explains the environmental Scope of La Rochelle Université

Environmental Aspect	Description
Functions	- Educational activities (teaching, research, academic programs - Administrative functions (management, operations, supportservices) - Recreational and cultural activities (sports events, cultural programs) – Student life (Student engagement, studentassociation)
Physical Boundaries	Campus buildings (academic buildings, administrative offices, laboratories, recreational facilities) - Grounds and landscaping (green spaces, lawns, gardens) - Transportation infrastructure (parking lots, roads, walkways)
Activities	- Energy consumption (heating, cooling, lighting, electricity usage) - Water usage (drinking, wastewater) - Waste generation (solid waste, recycling, hazardous waste) - Transportation (commuting, vehicle use, business trip) - Chemical usage (laboratories, cleaning, maintenance) - Land use (construction, landscaping) – Purchases (for educational activities, research, administration)
Products and Services	- Educational programs and courses - Research outputs and publications - Support services (food, printing, maintenance)

Gap Analysis of Environmental Concerns and Current Status Across Stakeholder Groups at La Rochelle Université Campus

Implementation Step	Current Status at La Rochelle Université Campus	Gap Analysis (April 2023)
Leadership Commitment	1 employee in charge of Sustainable Development with a link with the senior management	

Establish an EMS Team	People from some key departments are involved in the Sustainable Development policy of the University	Need to structure the involvement from colleagues about the Sustainability
Conduct an Initial Environmental Review	La Rochelle Université got in 2022 the “SDSR certification label” where you need to do a self-assessment in all its environmental scope. We have also calculated its carbon footprint for 2019 and now for 2023.	N/A
Develop an Environmental Policy	La Rochelle Université voted a environnemental policy in 2021. The carbon footprint in 2022 and a commuting plan in 2023 gave us two actions plans. We are currently working on a strategic plan for sustainability for all the activities of the University and about decarbonization	The first policy needs to be improved with objectives and target that we need to achieve.
Define Environmental Objectives and Targets	We have objectives in terms of reducing our carbon footprint, increasing the part of sustainable commuting	We need to define target especially for decarbonisation
Establish Procedures and Controls	The university have action plans to reduce its carbon footprint and the impact of commuting	Need to create procedures to keep up the actions plan
Raise Awareness and Train Personnel	Some training programs on environment is offer to personnel. Need to develop these training. Raising awareness by communication	Creation of plans for training student and personnel about the environment

	about solutions to change our practices	
Implement Communication Channels	Internal and external channels of the University is used to communicate about sustainable development aspects (newsletter, social networks, website…)	N/A
Monitor and Measure Performance	La Rochelle Université needs to create indicator for our environmental performance	N/A
Document EMS Documentation	N/A	N/A

Roles and Responsibilities in Environmental Management System (EMS) Structure for La Rochelle Université Campus

La Rochelle Université don't have an Environmental Management System as the ISO norms means but some strategic plan exists and we deal with a Sustainable Development and Social Responsibility (SDSR) approach. Given that, our university obtains in 2022 the SDSR certification label for higher education institution which deal with all the activities of the institution: governance, training, research, environmental policy and social policy. So, our sustainable development policy is structure according to that certification label. Roles and Responsibilities are defined in our structure as it is mention in the table below:

Role	**Description**
Environmental Management Committee (EMC)	Composition: member of the direction and key departments. The approach is interdisciplinary and integrate some committees which already exist. A committee which gathers colleagues from different activities and who are interested in the environment exists, it is a consultative group for our different projects and useful to share information's
Environmental Management	Thomas DUBAN, Sustainable Development project Manager is coordinating these activities. A vice-president supports the strategic plan

Representative (EMR)	
Departmental Environmental Coordinators	The are no departmental coordinators except the EMC explained above in the table
Cross-Functional Teams	Some department in the support functions in the University deal with the environmental aspects. The project Manager interact with these colleagues to coordinate our strategy
Authorities and Delegated Responsibilities	The governing board of La Rochelle Université takes decision about SDSR

Environmental Aspects. La Rochelle Université Campus

Environmental Aspect	**Description**
Energy Consumption	▪ Heating, cooling, and lighting of research laboratories, academic buildings, administrative offices, and classrooms. ▪ Electricity usage for equipment, computers, classroom technology, and research facilities. ▪ Energy consumption associated with renewable energy systems and experimental setups. ▪ Energy usage for classroom lighting, heating, and cooling.
Water Usage	▪ Drinking water consumption in laboratories, offices, classrooms, and communal areas. ▪ Wastewater generation from research activities, cleaning processes, and laboratory experiments. ▪ Water usage in laboratories, classrooms, and student facilities.
Waste Generation	▪ Solid waste generated from research materials, packaging, office activities, and teaching materials.

	▪ Recycling activities for paper, plastic, glass, and other recyclable materials. ▪ Hazardous waste generation from laboratory experiments, chemical usage, and disposal. ▪ Waste generation from discarded teaching materials, packaging, and office supplies.
Transportation	▪ Commuting-related emissions from faculty, staff, and students traveling to and from campus for classes and research. ▪ Vehicle use for transportation of research equipment, materials, and personnel. ▪ Carbon emissions associated with transportation infrastructure and operations. ▪ Transportation emissions from commuting to and from campus for classes.
Chemical Usage	▪ Usage of chemicals and hazardous substances in research experiments, laboratory procedures, and teaching activities. ▪ Cleaning and maintenance chemicals used for laboratory equipment, facilities, and classrooms. ▪ Proper handling, storage, and disposal of chemicals to minimize environmental impact. ▪ Chemical usage in teaching laboratories and practical sessions.
Land Use	▪ Construction activities related to building expansion, renovation, or infrastructure development for academic facilities. ▪ Landscaping practices for maintaining green spaces, gardens, and outdoor areas. ▪ Preservation of natural habitats and biodiversity within campus boundaries. ▪ Land use for classroom buildings, lecture halls, and academic facilities.
Research Outputs	▪ Environmental impact of research projects, including emissions, resource consumption, and waste generation.

	▪ Contributions to sustainable energy technologies, renewable energy solutions, and environmental conservation practices. ▪ Dissemination of research findings through publications, conferences, and knowledge-sharing platforms.

Legal Compliance. La Rochelle Université Campus

The table below present some of the key legislations that Université needs to deal with, to be in conformity with regulations.

Legislation/Principle	**Description**	**Relevance to La Rochelle Université Campus Operations**
AGEC (waste reduction and circular economy) Law – February 2020	This law plans for 20 years the reduction of waste generation and has the ambition to limit single-use plastic	La Rochelle Université needs to conform to these objectives (installation of fountain to avoid plastic bottle, limit waste generation…)
Tertiary decree – July 2019	The objective of this regulation is to reduce the energy consumption in service industry (decrease of 40% of energy consumption for 2030	La Rochelle Université plans building renovation, installation of photovoltaic panels
15 Measures for a Public Institution Eco-friendly – November 2023	This law asks for public institution to be exemplary in some sustainability aspects (sustainable transportations, purchases, building renovation…)	La Rochelle Université fill some of the measures of this plan, some other have to be planned in our new strategic plan
Plan for Energy sobriety – October 2022	In 2022 French government asks for public institution to take measures to save energy	La Rochelle Université plans actions to limit its gas and electricity consumption

Carbon footprint decree – July 202	French public institutions need to calculate their carbon footprint each three years and implement an action plan	La Rochelle Université calculate its carbon footprint for 2019 and the new one for 2023
Plan for climate, biodiversity and ecological transition for Higher education – November 2022	French higher education and research ministry asks for universities some measures in terms of governance, education and research to face the ecological transition	For example, La Rochelle Université needs to create 30 hours training about sustainability for all students, implement a strategic plan for sustainable conduct changes across all University functions
Sustainable commuting plan – December 2019	French public institutions need to do a diagnosis about how their employees and publics (students for universities) commute. Then, they have to create an action plan to enhance sustainable transportations	La Rochelle Université has voted its sustainable mobility action plan in 2023 after doing a survey about customs of students and employees.

SWOT Assessment for adopting EMS at La Rochelle Université Campus

Strengths	**Opportunities**
La Rochelle Université obtained the SDSR certification label in 2022	The Plan for climate, biodiversity and ecological transition for Higher education from the higher education ministry
Research group about sustainable commuting which helps to identify good practices	The ongoing strategic plan for sustainability
The research policy oriented on SmUCS	
A pioneer territory	

Weaknesses	Threats
Measures which take time / long terms measures	A change in university governance
Expensive measures as building renovation	

Environmental Objectives for Academia – at La Rochelle Université Campus

Environmental Objective	Target	Strategy to Achieve Objective
Reduce our Carbon footprint	By 5% each year until 2030	Action to reduce our professional transportations, purchases, building renovation. Action plan will be implemented after the calculation of our carbon footprint for 2023. We are currently working with laboratories to reduce the impact of research
Increase the rate of sustainable commuting	N/A	Actions to promote commuting. Discuss with local authorities to enhance the public transportation
N/A Reduce our energy consumption	N/A By 10% until 2024 (in relation to 2022)	Work on building renovation, raise awareness for energy saving, replace light by LED. An energy manager has been recruited to plan actions for energy saving

Technical University of Civil Engineering of Bucharest (UTCB) Responses

Gap Analysis of Environmental Concerns and Current Status Across Stakeholder Groups at UTCB Campus

Stakeholder Group	Primary Environmental Concerns	Current Status at UTCB	Gap Analysis
Students	- Sustainability practices - Waste management - Energy efficiency - Environmental education and activism	- Recycling bins have installed in some faculties of the UTCB - No energy-saving initiatives - Limited environmental education opportunities for students	- Lack of comprehensive sustainability practices - Inadequate waste management systems - Limited energy efficiency measures - Need for environmental education programs embedded in all curricula with mandatory hours of environmental activism/practices every year.
Staff	- Workplace sustainability - Energy use - Waste management - Transportation options	- Recycling bins have installed in some faculties of the UTCB - No efforts to reduce energy consumption - No transportation incentives for staff	- Insufficient focus on workplace sustainability - Opportunities for improving energy efficiency - Need for enhanced waste management strategies - Lack of transportation incentives
Surrounding Community	- Pollution - Noise - Traffic congestion	- No efforts to reduce emissions and waste - Some initiatives regarding air quality assessment and awareness	- No measures to address traffic congestion and limited measures to asses pollution. - Lack of opportunities for enhanced community engagement

	- Land use - Environmental footprint	- Limited community engagement initiatives - Inexistent environmental impact assessment	- Need for comprehensive environmental impact assessments
Research Community	- Environmental conservation - Biodiversity - Climate change adaptation - Sustainable development	- Some research projects related to environmental conservation ? - Some research project on biodiversity and climate change adaptation in cities - Moderate focus on sustainable development	- Need for expanding research on environmental conservation - Need to increased emphasis on biodiversity and climate change adaptation in all faculties of UTCB - Lack of collaboration between research groups/faculties for projects related to environment. Collaboration should be increased especially since research project on climate change and sustainability need holistic approaches.

Key Observations:

1. Students:

There is a significant gap regarding environmental concerns through the student community. Mainly since there are not many awareness campaigns related to environmental topics, then the infrastructure of the UTCB need to be improved to allow students to be more environment friendly, such as full and accessible recycling infrastructure, free drinking water fountains, green mobility alternatives, etc.

2. Staff:

Workplace sustainability needs more attention, along with initiatives to reduce energy consumption and enhance waste management. Transportation incentives for staff are lacking especially since green mobility alternatives are not popular in Bucharest and faced citizens reluctance. A mobility analysis should be conducted to estimate the exact proportion of staff coming at the university with low carbon transports.

3. Surrounding Community:

Few community engagement initiatives have been conducted during the last years such as the Cross of Change related to raise awareness about climate change, sustainability, and sports. This event is open to all, from children to adults. Then in the last year a community garden initiative has been conducted with the helped of NGOs and locals at the Student Dormitory number 7. In this garden we have 3 areas, one for gardening, one for compost and one for recreation with recycles urban furniture made by students and neighbours.

4. Research Community:

Some faculties of the UTCB are more focusing their research on environmental matters such as the faculty of building services which is mainly conducting research projects related to climate change adaption and energy efficiency.

Overview of Environmental Scope of the UTCB Campus

Environmental Aspect	**Description**
Functions	- Educational activities (teaching, research, academic programs) - Administrative functions (management, operations, support services) - Recreational and cultural activities (sports events, cultural programs)
Physical Boundaries	- Campus buildings (academic buildings, administrative offices, laboratories, dormitories, recreational facilities) - Grounds and landscaping (green spaces, lawns, gardens) - Transportation infrastructure (parking lots, roads, walkways)
Activities	- Energy consumption (heating, cooling, lighting, electricity usage) - Water usage (drinking, irrigation, wastewater) - Waste generation (solid waste, recycling, hazardous waste) - Transportation (commuting, vehicle use) - Chemical usage (laboratories, cleaning, maintenance)

	- Land use (construction, landscaping)
Products and Services	- Educational programs and courses - Research outputs and publications - Support services (printing, maintenance, and food in the coming years after the renovation of the UTCB Canteen for the moment the food services form UTCB are only for occasional events)

Gap Analysis of Environmental Concerns and Current Status Across Stakeholder Groups at UTCB Campus

Implementation Step	**Current Status at UTCB Campus**	**Gap Analysis (April 2023)**
Leadership Commitment	- No commitment demonstrated	- Lack of clear commitment and awareness about it.
Establish an EMS Team	- No formal dedicated EMS team	- Since the UTCB is enrolled in the SR EN ISO 14001:2015 certification the Quality Control Team has been dedicated to it ?
Conduct an Initial Environmental Review	- No environmental assessments conducted	- Lack of skills, human resources and awareness for the implementation of Environmental assessment.
Develop an Environmental Policy	- Limited environmental policy	- Lack of Environmental policies within UTCB charts and rules.
Define Environmental Objectives and Targets	- Limited environmental objectives and targets	- Lack of clear and measurable objectives and targets focus environmental matters.
Establish Procedures and Controls	- Some procedures have been created since UTCB is enrolled SR EN ISO 14001:2015 certification two	- Need to develop the actual procedure that have been sketched

	new general procedures were introduced: PG-10 Environmental aspects, respectively PG-11 Monitoring, measurement, analysis and performance evaluation.	- Need to create clear documents for controls to manage environmental aspects and impacts
Raise Awareness and Train Personnel	- Also, within the ISO14001:2015 an operational procedure named PO-04 Personal Training have been introduced. - Some initiatives have been conducted regarding Climate Change Awareness workshops and waste management activities focus on compost. - During 2023, staff training sessions were held in the field of quality on the topics of: equal opportunities, internal audit, environmental protection and combating anti-Semitism.	- Need to increase the number of trainings and workshop with students and staff to raise awareness and engaged the all university in the sustainable and low carbon transition.
Implement Communication Channels	- No communication channels for environmental matters	- Need for formalized channels to facilitate internal and external communication, feedback, and reporting on environmental issues
Monitor and Measure Performance	- Within the works to reach ISO14001:2015 two operational procedures have been introduced: PO-04 Personal Training and PO-03 Identification and tracking.	- The ability to assess progress and identify areas for improvement should be tested.

Document EMS Documentation	- Some documentation of EMS procedures and records seems to exist.	- Clear documentation to support EMS implantation should be created and compiled.

Additional observations:

- Elaboration of the documentation regarding the implementation of the SR EN ISO 14001:2015 standard – Environmental management systems and the restoration of the Quality Manual which, following the changes, became the Integrated Management System Manual, and of all general procedures (PG) and operational procedures (PO) for compliance with the requirements of SR EN ISO 9001:2015, respectively SR EN ISO 14001:2015 standards. Following this approach, two new general procedures were introduced: PG-10 Environmental Aspects, respectively PG-11 Monitoring, measurement, analysis and performance evaluation. Two new operational procedures were also introduced: PO-03 Identification and traceability, and PO-04 Personaltraining;
- Ensuring the Environmental Management Systems certification according to the SR EN ISO 14001:2015 standard, at the UTCB level, from the Romanian Society for Quality Assurance (SRAC) during the course;
- Introducing the SR EN ISO 14001:2015 standard - Environmental management systems and thus creating an integrated Quality-Environment management system.
- Organization of informal meetings with UTCB quality management officials regarding the changes made in UTCB in order to implement SR EN ISO 14001:2015 and the creation of an Integrated Quality-Environment Management System.



C E R T I F I C A T

SRAC certifică organizația/ certifies the organisation

UNIVERSITATEA TEHNICA DE CONSTRUCTII BUCURESTI

Sediul social: B-dul. Lacul Tei, nr. 122 - 124, sector 2, București
Sedii de lucru: B-dul. Pache Protopopescu, nr. 66, sector 2, București;
Calea Plevnei, nr. 59, sector 1, București

pentru următoarele activități/
for the following fields of activities

Învățământ superior și cercetare științifică

Higher education and scientific research

că are implementat și menține un sistem de management de mediu conform condițiilor din standardul

which has implemented and maintains an environmental management system which fulfils the requirements of the standard

SR EN ISO 14001:2015 (ISO 14001:2015)

Director General
Ing. Mihaela Cristea

THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

SRAC as an IQNet Partner hereby states that the organization:

UNIVERSITATEA TEHNICA DE CONSTRUCTII BUCURESTI

Registered Office: B-dul. Lacul Tei, nr. 122 - 124, sector 2, București
Productive Units: B-dul. Pache Protopopescu, nr. 66, sector 2, București;
Calea Plevnei, nr. 59, sector 1, București

for the following scope:

Higher education and scientific research

has implemented and maintains an

Environmental Management System

which fulfils the requirements of the following standard:

ISO 14001 : 2015

Issued on: 2023 - 03 - 29
First issued on: 2023 - 03 - 29

Registration Number: RO - 6009

Alex Stoichitoiu
President of IQNet

eng. Mihaela Cristea
SRAC General Manager

- The certificate issued by SRAC certifying the implementation and maintenance of an environmental management system according to the conditions of the ISO 14001:2015 standard, as well as the associated IQNet certificate.
- Ensuring the recertification of the Quality Management System according to the SREN ISO 9001:2015 standard, at the UTCB level, from the Romanian Society for Quality Assurance (SRAC) during March 2023 and the transformation of the system into an integrated Quality-Environment;

The documentation of the Integrated Management System (SMI) within UTCB, available at https://utcb.ro/centrul-de-management-al-calitatii/, includes specific procedures for the education process, which start from the planning of study programs and continues with the evaluation of didactic processes and their periodic monitoring.

The component documents of the Quality-Environment Integrated Management System in UTCB, in 2023, were we can find three components connected to our gap analysis:

- PG-10_Ed.6-Environmental aspects;
- PO-03_Ed.6-Identification and traceability;
- PO-04_Ed.6-Staff training;

Next step for 2024 :

- Ensuring the maintenance of the Quality-Environment Integrated Management System certification.

- Carrying out a significant number of meetings at the UTCB level in order to raise awareness among the entire staff of current issues regarding: equal opportunities, internal quality audit, environmental protection and combating anti-Semitism.

Roles and Responsibilities in Environmental Management System (EMS) Structure for UTCB Campus

Role	**Description**
Environmental Management Committee (EMC)	Not defined
Environmental Management Representative (EMR)	Not defined
Departmental Environmental Coordinators	Not defined
Cross-Functional Teams	Not defined
Authorities and Delegated Responsibilities	Not defined

Environmental Aspects. UTCB Campus

Environmental Aspect	Description
Energy Consumption	- Heating, cooling, and lighting of research laboratories, academic buildings, and administrative offices. - Electricity usage for equipment, computers, and research facilities. - Energy consumption associated with experimental setups.
Water Usage	- Since they are no fountains the consumption of drinking water is only related to private staff and students water's (Bottles from home or surrounding markets) - Irrigation water usage for maintaining green spaces. - Wastewater generation from research activities, cleaning processes, and laboratory experiments ? - Water usage in laboratories, classrooms, and student facilities.
Waste Generation	- Waste generated by construction and renovation sites. (New buildings, extensions, renovation, landscaping, etc) - Solid waste generated from research materials, packaging, office activities, and teaching materials. - Recycling activities for paper, plastic, glass, and other recyclable materials. - Hazardous waste generation from laboratory experiments, chemical usage, and disposal.
Transportation	- Commuting-related emissions from faculty and staff traveling to and from campus for classes and research. - Carbon emissions from student mobilities, research project and researchers conferences. - Vehicle use for transportation of research equipment, materials, and personnel.

	- Carbon emissions associated with transportation infrastructure and operations.
Chemical Usage	- Usage of chemicals and hazardous substances in research experiments, laboratory procedures, and teaching activities. - Cleaning and maintenance chemicals used for laboratory equipment, facilities, and classrooms. - Proper handling, storage, and disposal of chemicals to minimize environmental impact.
Research Outputs	- Environmental impact of research projects, including emissions, resource consumption, and waste generation. - Contributions to sustainable energy technologies, renewable energy solutions, and environmental conservation practices. - Dissemination of research findings through publications, conferences, and knowledge-sharing platforms.

Legal Compliance. UTCB Campus

Legislation/Principle	**Description**	**Relevance to UTCB Campus Operations**
Higher Education Law no. 199/2023.	This law provides the legal framework for the exercise, in higher education institutions, under the authority of the Romanian state, of the process of education, research and continuous training and regulates the structure, organization and functioning of higher education in Romania, the status of higher education personnel, as well as the legal framework of quality assurance.	

National Education Law number 1 of 2011	This law provides the framework for the exercise under the authority of the Romanian state of the fundamental right to education throughout life. The law regulates the structure, functions, organization and operation of the national state, private and denominational education system	
Law no. 319/2006 of occupational health and safety	The purpose of this law is to establish measures to promote the improvement of safety and health at work for workers.	Highlights the importance of selecting appropriate equipment and chemicals in university labs and implementing a tailored risk management system.

SWOT Assessment for adopting EMS at UTCB Campus

Strengths	**Opportunities**
Strong students' community involved in the campus life	Enhanced Reputation
Expertise in Sustainable Cities and Energy efficiency	Funding Opportunities
	Increased engagement of students and staff in the Campus
Weaknesses	**Threats**
Financial resources	Regulatory and Compliance Risks
Human resources and skills	Political and budget context

Adaptation to EMS Requirements	

Environmental Objectives for Academia – at UTCB Campus

Environmental Objective	**Target**	**Strategy to Achieve Objective**
Reduce disposable product related to water consumption	Quantity of water consumption from refill stations by year (litter/year)	Invest in infrastructure improvements such as water refill stations, where students can easily refill their water bottles, and dishwashing facilities for reusable food containers. Make reusable alternatives readily available and affordable. This could include providing reusable water bottles, coffee mugs, utensils, and food containers at campus stores **(Ex: UTCB Green Campus Store)** or cafeterias.
Reduce disposable product related to events (foods and drinks)	By X% of events within Y years	Work with catering companies that prioritize sustainability and offer reusable or compostable serving ware and packaging. Ensure they have a system for collecting and properly disposing of compostable materials. Encourage Bulk Purchases Rent, Borrow or buy Reusable Serveware
Reduce Campus Energy Consumption	By X% within Y years	Implement energy efficiency upgrades and renewable energy projects across campus facilities.

Increase Recycling Rates	Achieve a recycling rate of X% by Y year	Improve recycling facilities and conduct awareness campaigns to encourage recycling among students and staff.
Enhance Sustainable Transportation	Increase the use of public transportation, cycling, and walking by X% among students and staff by Y year	Develop partnerships and incentives to promote the use of sustainable transportation options.

University of Rostock (UROS) Responses

Gap Analysis of Environmental Concerns and Current Status Across Stakeholder Groups at University of Rostock

Stakeholder Group	**Primary Environmental Concerns**	**Current Status at University of Rostock**	**Gap Analysis**
Students	- Energy efficiency - Green spacing within campus	- Insufficient energy-saving initiatives - Limited green spacing in campus	- Limited energy efficiency measures - Inadequate green spacing in campus
Staff	- Workplace sustainability - Transportation options	- moderate workplace sustainability - Minimal transportation incentives for staff	- Insufficient focus on workplace sustainability - Lack of transportation incentives
Surrounding Community	- Noise - Traffic congestion - Environmental foot print	- Efforts to reduce noise - Limited community engagement initiatives	- Limited measures to address traffic congestion - Need for comprehensive environmental impact assessments

		- Moderate environmental impact assessment	
Research Community	- Biodiversity - Climate change adaptation	- moderate focus on biodiversity and climate change adaptation	- Need for increased emphasis on biodiversity and climate change adaptation

Overview of Environmental Scope of the University of Rostock

Environmental Aspect	**Description**
Functions	- Educational activities: Teaching, research, and academic programs. - Administrative functions: Management, operations, and support services. - Recreational and cultural activities: Sports events, cultural programs, and community activities.
Physical Boundaries	- Campus buildings: Academic buildings, administrative offices, laboratories, libraries, dormitories, and recreational facilities. - Grounds and landscaping: green spaces, lawns, gardens, trees, and outdoor areas. - Transportation infrastructure: Parking lots, roads, walkways, and bicycle lanes.
Activities	- Energy consumption: Heating, cooling, lighting, and electricity usage in buildings. - Water usage: Drinking water consumption, irrigation, and wastewater generation.

	- Waste generation: Solid waste, recycling, and hazardous waste disposal. - Transportation: Commuting of students, faculty, and staff, as well as university-owned vehicle use. - Chemical usage: Laboratory operations, cleaning products, and maintenance activities. - Land use: Construction, landscaping, and expansion projects.
Products and Services	- Educational programs and courses offered by the university. - Research outputs and publications. - Support services such as food services, printing, and maintenance.

Gap Analysis of Environmental Concerns and Current Status Across Stakeholder Groups at University of Rostock

Implementation Step	**Current Status at University of Rostock**	**Gap Analysis (April 2024)**
Leadership Commitment	- Obtain support from senior management for the establishment for EMS	/
Establish an EMS Team	- A dedicated EMS team will be established in 2025	- A dedicated EMS team is not available yet
Conduct an Initial Environmental Review	- Several environmental reviews haven been conducted regarding CO2 balance and climate neutrality	- Need for more comprehensive reviews concerning more aspects

Develop an Environmental Policy	- A formal policy for sustainability at UROS is available	- Policies can be updated based on current status
Define Environmental Objectives and Targets	- Several environmental objectives and targets have been defined	/
Establish Procedures and Controls	- A general guideline for procedures and controls at university level is not available - Several faculties have their own procedures and controls- - Most procedures and controls are energy related	- Lack of a general guideline at university level - Need for procedures and controls covering more aspects
Raise Awareness and Train Personnel	- Training sessions offered by university for staff and students regarding the sustainability	- No specialized train for personnel involved in environmental management
Implement Communication Channels	- Webpages to disseminate updates and information related to environmental management - Formal communication channels are available	/
Monitor and Measure Performance	- Monitoring of CO2 balance and energy consumption are set up	- Limited monitoring, more monitor regarding water usage and waste generation can be established
Document EMS Documentation	- Documentation of EMS procedures and controls have been conducted	/

Roles and Responsibilities in Environmental Management System (EMS) Structure for University of Rostock

Role	Description
Environmental Management Committee (EMC)	- A roundtable consisting of rectors, prorectors and related consultants is available
Environmental Management Representative (EMR)	- Mr. Andreas Tesche is the general coordinator for the sustainability office at UROS and is responsible for the communication between departments, conducts internal audits, ensures compliance, and reports to senior management
Departmental Environmental Coordinators	- Only few of the faculties have dedicated coordinators for the EMC
Cross-Functional Teams	- For specific environmental projects and initiatives, temporary teams can be established
Authorities and Delegated Responsibilities	- Rectorate is responsible for the decision making within the EMS structure

Environmental Aspects. University of Rostock

Environmental Aspect	Description
Energy Consumption	- Heating, cooling, and lighting of research laboratories, academic buildings, administrative offices, and classrooms. - Electricity usage for equipment, computers, classroom technology, and research facilities. - Energy consumption associated with renewable energy systems and experimental setups.

	- Energy usage for classroom lighting, heating, and cooling.
Water Usage	- Drinking water consumption in laboratories, offices, classrooms, and communal areas. - Wastewater generation from research activities, cleaning processes, and laboratory experiments. - Water usage in laboratories, classrooms, and student facilities.
Waste Generation	- Solid waste generated from research materials, packaging, office activities, and teaching materials. - Recycling activities for paper, plastic, glass, and other recyclable materials. - Hazardous waste generation from laboratory experiments, chemical usage, and disposal. - Waste generation from discarded teaching materials, packaging, and office supplies.
Transportation	- Commuting-related emissions from faculty, staff, and students traveling to and from campus for classes and research. - Vehicle use for transportation of research equipment, materials, and personnel. - Carbon emissions associated with transportation infrastructure and operations. - Transportation emissions from commuting to and from campus for classes.
Chemical Usage	- Usage of chemicals and hazardous substances in research experiments, laboratory procedures, and teaching activities. - Cleaning and maintenance chemicals used for laboratory equipment, facilities, and classrooms. - Proper handling, storage, and disposal of chemicals to minimize environmental impact. - Chemical usage in teaching laboratories and practical sessions.

Research Outputs	- Environmental impact of research projects, including emissions, resource consumption, and waste generation. - Contributions to sustainable energy technologies, renewable energy solutions, and environmental conservation practices. - Dissemination of research findings through publications, conferences, and knowledge-sharing platforms.

Legal Compliance. University of Rostock

Legislation/Principle	**Description**	**Relevance to University of Rostock Operations**
Application of the Sustainability Code in Relation to Higher Education Institutions – an Approach to Sustainability Reporting at Higher Education Institution	Guidelines for sustainable development at German higher education institutions in order to create an integrated overall guide	The operations and actions at UROS are guided by this instruction
Climate Protection Programme by German Federal Government	The Federal Government's overall plan for climate protection policy. It lists the most important measures in the areas of transport, energy, buildings, industry and agriculture. In this way, it makes a significant contribution to achieving the climate protection targets.	Presenting opportunities for UROS to contribute to climate protection efforts through research, education, collaboration, and innovation. As an active member, UROS can play a pivotal role in advancing climate resilience and sustainability both locally and globally.
Climate Protection Act by German Federal Government	A framework law that defines the principles and obligations of climate policy in a state or sub-state unit.	Offering a framework for concerted efforts to address climate change in Germany. UROS can based on this act contribute on research, education, innovation, and policy dialogue to support the objectives of the act and accelerate the transition to a

		sustainable, low-carbon society

SWOT Assessment for adopting EMS at University of Rostock

Strengths	**Opportunities**
Accredited Quality Standards	Enhanced Reputation
Dedicated Research Infrastructure	Funding Opportunities
Expertise in Sustainable Energy	Educational Integration
Weaknesses	**Threats**
Resource Constraints	Regulatory and Compliance Risks
Adaptation to EMS Requirements	Technological Advancements

Environmental Objectives for Academia – at University of Rostock

Environmental Objective	**Target**	**Strategy to Achieve Objective**
Reduce Campus Energy Consumption	By 10% from 2019 to 2030	Implement energy efficiency upgrades and renewable energy projects across campus facilities
Reduce Campus CO2 emission	By 15% from 2019 to 2025	- Reducing energy consumption (energetic refurbishment and prioritizing climate-friendly new buildings, reducing trips and increase awareness) - Reduce emission factors (use alternative energy sources, use rail trip for business trip)