

**Developing a Performance-Based EMS in a Large Research, Medical
Center University**

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Executive Summary

In 2003, Duke University began a major initiative to re-invent its environmental management processes by designing, building, and implementing a management system that will cover all aspects of the University life – education, research, health care, management, operations, and facilities. The initiative builds on the institution's solid environmental history, including regulatory compliance, education, research, and service. An Environmental Management System Planning Committee was formed to design a system to address the growth of campus sustainability and stewardship; to improve and report environmental performance; and, respond to increased scrutiny from the regulatory community.

The committee studied existing and proposed management systems at a number of universities and proposes a performance-based management system focused on key improvement areas. The planning committee's proposed framework is centered on five key focus areas:

- ❑ sustainability,
- ❑ compliance,
- ❑ resource conservation and preservation,
- ❑ environmental stewardship, and
- ❑ education and research.

Environmental performance goals were established under this framework and continuous improvement projects and initiatives will be implemented by members of the university community to improve performance and achieve the established goals. A primary goal of the new system is to continuously improve Duke's environmental performance.

The committee proposed an organization to facilitate and coordinate aspects of the initiative. The organization includes a Policy Committee to provide leadership and direction on a university-wide basis and an Environmental Management Advisory Committee, made up of members of the student body, faculty, and staff, to develop strategic performance goals in the key focus areas and oversee the implementation of projects and initiatives to achieve those goals. A broad-based Environmental Task Force will be formed to develop and implement projects, programs, and initiatives consistent with the goals established for the key focus areas. The Environmental Programs Division of the Occupational Environment & Safety Office will provide staff support for each committee or task force.

Finally, committees and task forces will be linked to each other and to key focus areas and environmental performance goals through performance standards that will help measure the effectiveness of our policies and programs and our success in meeting goals and objectives.

INTRODUCTION

Duke University has a long history of leadership and innovation on environmental issues. Numerous projects and initiatives have been undertaken and new ones are underway at the University that include programs in recycling, energy conservation, building design, pollution prevention, emissions reductions, compliance improvement, alternative fuel vehicles, and storm water management. The importance of the University's stewardship is reflected not only in its relevance to students, staff, and faculty, but also in its response to growing environmental challenges such as global warming, urban sprawl, limited natural resources, and the loss of ecological and biological diversity. In its role as a world-class institution, the University should continue to pursue leadership in its approach to environmental policies, management, and education by setting a standard for other universities, the state, and the local community.

Why an Environmental Management System?

Environmental compliance - campus sustainability - the need to improve and report environmental performance - all have become important factors in the decision-making processes of universities. An Environmental Management System or EMS is an effective management tool that will enable the University to improve overall environmental performance, minimize environmental impacts, incorporate environmental issues into decision-making, and integrate environmental values into education and research. Simply put, an EMS is a systematic process to identify the environmental impacts of what we do, establish priorities, set performance improvements goals, initiate projects and continuously monitor and measure success. The EMS can assist the University in moving on a performance continuum from regulatory compliance to environmental stewardship and sustainability through the use of systems thinking and input from key stakeholders.¹

Environmental issues are now more complex and interconnected. The traditional way of addressing environmental issues – in a reactive, ad hoc, end-of-pipe manner – has become highly inefficient. Few times has higher education been as receptive to change in environmental management as it is now. The University can embrace this opportunity to reinvent current environmental management systems that are reactive, end-of-pipe management processes into performance based management systems that emphasize continuous improvement of performance through increased quality, efficiency and integrity.

Aggressive enforcement of environmental laws and regulations has resulted in new performance and behavioral standards for universities and colleges. For example, US EPA Regions I, II, III, and X (Region IV has announced its intent to target colleges and universities in the coming year) launched initiatives to identify compliance problems at universities through comprehensive multi-media inspections. Numerous violations were found and significant penalties have been assessed. In most cases, negotiated settlements following citations for non-compliance have included a requirement to plan and implement an Environmental Management System. Further, the US EPA Office of Policy, Economics, and Innovation issued a notice in May of last year that it had selected colleges and universities as one of seven industry sectors to participate in its Industry Sector Environmental Performance Program. Key elements in that

¹Gallagher, Deborah Rigling. 2004. "Building Environmental Management Systems Focused on Sustainability: The Influence of Employees, Company Leaders, and External Stakeholders", in *New Horizons in Research in Sustainable Organizations; Emerging Ideas, Approaches and Tools for Practitioners and Researchers*, edited by Mark Starik. Sheffield: Greenleaf Publishing.

program include (1) Definition of Environmental Performance Measures, (2) Flexibility in Compliance Performance, and (3) Promotion of the Use of Environmental Management Systems.

Colleges and universities are unique places that serve multiple missions, including education, research and public service and therefore environmental management must be addressed in a proactive, yet flexible manner. A carefully designed and properly implemented management system can ensure that environmental goals are met and environmental performance objectives are achieved. A number of systems or system models were reviewed and assessed to identify one that best fits Duke University. MIT, Boston College, the University of North Carolina, Michigan State, Washington State, Cornell, George Washington University, the University of Michigan and member institutions in the Campus Consortium for Environmental Excellence (C2E2) have, among others, recognized the need and opportunity to reinvent current practices and adopt improved management systems.

Preliminary Planning

Shortly after approval and funding to proceed with the development of an Environmental Management System suitable for this University, an EMS Planning Committee (the Committee) was formed to develop an implementation plan. The Committee consisted of representatives of the Occupational & Environmental Safety Office, Facilities Management, students and faculty in the Nicolas School of the Environment, University Procurement, The Duke University Greening Initiative (DUGI), the Duke University Environmental Alliance (EA), the Sustainability Coordinator, and the Medical Center Architect's Office and Medical Center Engineering and Operations. The committee reviewed a number of system models including ISO 14001 EMS specifications, US EPA's compliance-focused system model, EMS guides for small and medium-sized organizations, US EPA's College and University Environmental Management System model, environmental management systems for healthcare facilities, and management system guides for small laboratories. The committee also reviewed environmental initiatives underway at MIT, George Washington University, and the University of Michigan and has drafted the following plan as a blend of the University of Michigan and George Washington University initiatives which best seem to meet the needs and character of Duke.

PROPOSED MANAGEMENT SYSTEM

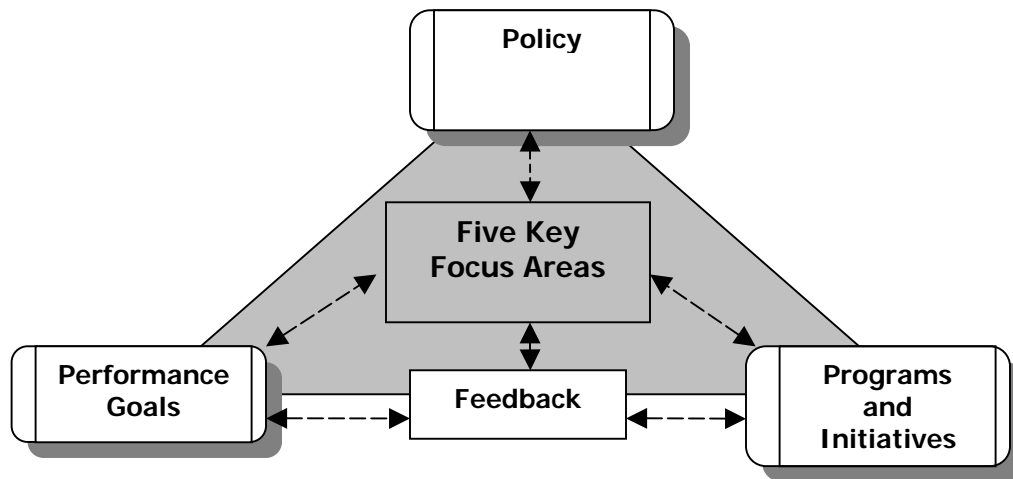
The Committee's overall objective has been to develop an EMS to enable the University to improve environmental performance, reduce the environmental impact of University operations and activities, and incorporate environmental issues into decision-making. The Committee has defined a management system framework, performance standards and indicators, and an organization to support the system.

Overview of the Framework

The framework, which is depicted below, is comprised of:

- ❑ an environmental policy statement,
- ❑ five key environmental focus areas,
- ❑ a set of environmental performance goals,
- ❑ metrics to provide a detailed assessment of specific operations and activities at the University
- ❑ programs and initiatives to meet performance goals, and
- ❑ performance feedback

Environmental Management System Framework²



Environmental Policy Statement

The first step in developing an EMS framework was to articulate the University's policy concerning environmental behavior and performance. A draft policy statement defining the University's commitment to environmental stewardship is stated below.

Duke University Draft Environmental Policy Statement

Duke University is committed to environmental excellence on our campus and in those communities with which we interact through our research and teaching and our institutional environmental policies and practices.³

Duke University's policy on environmental leadership is supported by the institution's environmental management system which is the key element of the University's efforts to meet or exceed all applicable environmental regulatory requirements as well as our own environmental management standards; pursue pollution prevention and waste reduction; encourage reuse and recycling; conserve natural resources; and, incorporate state-of-the-art environmental practices into our operations.

We will accomplish this high standard through integrating environmental management into our academic and business planning and decision making processes and by setting and tracking measurable environmental performance goals and objectives.

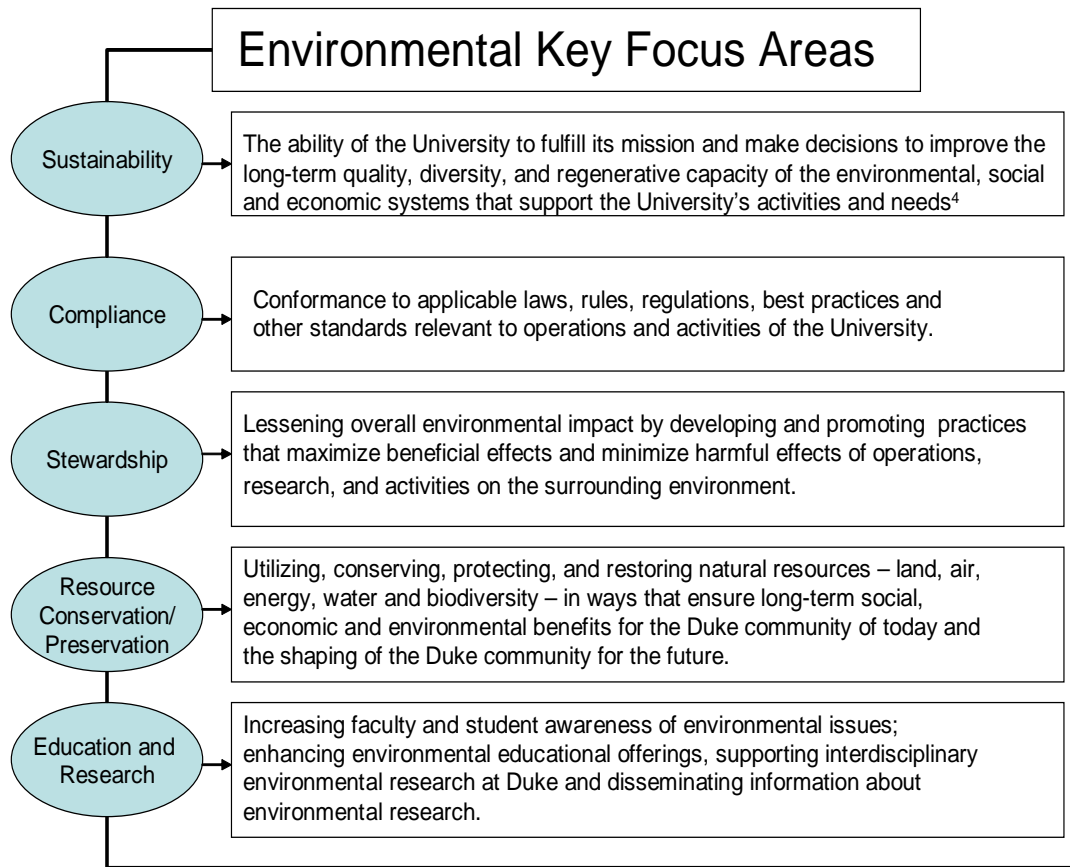
Key Focus Areas

The next step in building the framework was to select a set of 5 environmental key focus areas that have an impact on the university and have campus-wide applicability. Together the key focus areas represent a management continuum from compliance to pollution prevention to conservation and preservation of resources to sustainability, all supporting environmental

² Adapted from "Environmental Task Force Advisory Report to President Mary Sue Coleman". 2003. University of Michigan.

³ Adapted from "MIT Environmental Health and Safety Policy." 2001. EHS-MS001a120502.

education and research. Performance indicators have been defined for the focus areas to ensure continuous improvement of environmental performance.



Environmental Performance Goals

An Environmental Management Advisory Committee will draft long-range performance goals to guide Duke's environmental policy into the future and support implementation of programs and initiatives with specific environmental performance objectives. They will be forwarded to the Policy Committee for approval.

Environmental Programs and Initiatives

Individuals who represent a diverse set of stakeholders across the University will design programs and initiatives to address environmental impacts and meet environmental performance goals. Performance enhancement opportunities aligned with the University's goals will incorporate continuous improvement processes to set specific objectives and targets, and gather data to monitor progress using appropriate metrics. Programs and initiatives will be selected to enhance the environmental performance and quality of the campus and to engage students, faculty, staff, and other stakeholders in the process.

⁴ Rodriguez, Sandra I., Matthew S. Roman, Samantha C. Sturhahn, and Elizabeth H. Terry. 2002. *Sustainability Assessment and Reporting for the University of Michigan's Ann Arbor Campus*.

Performance Feedback

A key component of the EMS plan is a feedback mechanism for evaluating and measuring the effectiveness of programs and to measure success in meeting the goals and objectives defined by the Environmental Management Advisory Committee.

PERFORMANCE STANDARDS AND INDICATORS⁵

Specific performance standards, performance indicators, and metrics will be developed to assess progress and to review and evaluate management processes and operational outcomes. Institutionalizing measurement according to appropriate indicators and a liberal reporting process will enable the University to measure its progress with respect to environmental performance.

ORGANIZATIONAL PLAN⁶

The EMS Planning Committee has developed an organizational structure which incorporates various committees and groups originating in the major operating, academic, and research units of the University. The Environmental Management Advisory Committee will be made up of volunteers. The Environmental Task Force and its subcommittees will be structured to facilitate work on the high priority initiatives identified by the Advisory Committee. Members of the Environmental Policy Committee will be appointed or selected through the President's Office. The overall organization is structured to facilitate collaboration and maximize efficient use of available resources, and encourage synergism:

- ❑ *The Environmental Policy Committee*, appointed by the President, will provide leadership, stewardship, and executive direction by establishing policy, authorizing objectives and routinely reporting on the progress toward goals.
- ❑ *An Environmental Management Advisory Committee* that will provide guidance on activities and projects conducted by the Environmental Task Force and communicate progress towards completing those initiatives to the campus community and other stakeholders. The committee will facilitate collaborative work on initiatives conducted by university schools, departments, institutes, or centers. The Committee will develop Environmental Performance Goals, define performance indicators, and establish metrics to measure success.
- ❑ *An Environmental Task Force* consisting of a key stakeholder who will assume ownership of goals and objectives established by the Environmental Management Advisory Committee. Task Force members may conduct much of their work through key focus subcommittees that will plan and implement projects and activities to achieve the Environmental Performance Goals established by the Environmental Management Advisory Committee and approved by the Environmental Policy Committee.
- ❑ *The Occupational Environment and Safety Office* will support each committee, task force, and subcommittee as staff members to those organizations.

⁵ Adapted from "Green University Strategic Plan." 1996. George Washington University.

⁶ Ibid.

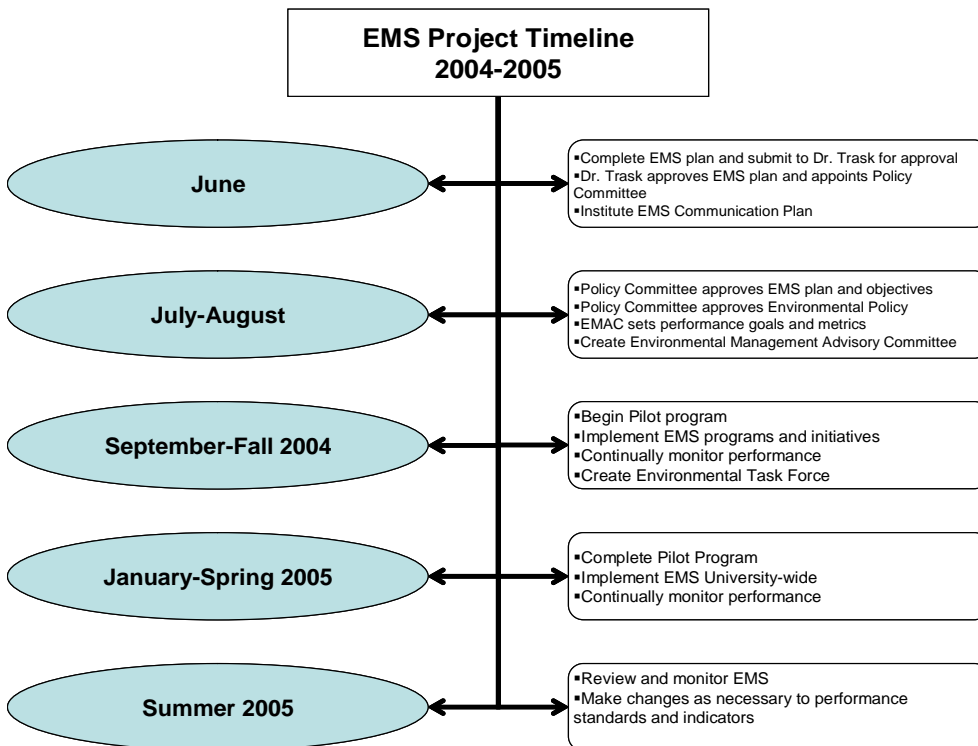
LINKING FRAMEWORK TO ORGANIZATION

Each Committee's responsibilities are shown on the attached chart. The Policy Committee has the responsibility of providing senior leadership and driving policy decisions. The Environmental Management Advisory Committee will establish institutional environmental performance goals for approval by the Policy Committee and will collaborate with the Task Force Subcommittees on completing projects and initiatives to enhance environmental performance.

Pilot Program

Once the organizations envisioned to drive EMS implementation have been put into place, a pilot program will be implemented. This pilot will focus on use of the EMS in one or two key environmental focus areas. Pilot program data will be evaluated to determine the effectiveness of the EMS in improving environmental performance. Pilot program performance will be monitored by the EMS Planning Committee to identify areas of improvement prior to implementing the system campus-wide. An approximate timeline to complete planning tasks, undertake the pilot, and begin implementation is depicted below.

Project Timeline



ACKNOWLEDGEMENTS

EMS Planning Committee Members

Committee Members

Leanne Borgen - University Procurement & Supply Chain Management

Bill Brewer, Chair - OESO Environmental Programs

Judd Edeburn - Duke Forest

Kimbell Furguson - Medical Center Architect's Office and Engineering & Operations

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Sharron Rogers - NC Department of Environment & Natural Resources

Leonard Sarapas - Boston Scientific Company

John Seymour - NC Department of Environment & Natural Resources

Ross Tabachow - CDM Engineers

ADDITIONAL MATERIAL AND SYSTEMS REVIEWED

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