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Environmental management — Environmental performance evaluation — Guidelines

Management environnemental — Évaluation de la performance environnementale — Lignes directrices

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 207, *Environmental management*, Subcommittee SC 4, *Environmental performance evaluation*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/SS S26, *Environmental management*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 14031:2013), of which it constitutes a minor revision. The changes compared to the previous edition are as follows:

— terminological entries have been added and updated from ISO 14001 and ISO 14050;

— terms such as “condition of the environment” have been revised to “environmental condition” in accordance with ISO 14001;

— the references have been updated.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Many organizations are seeking ways to understand, demonstrate and improve their environmental performance. This can be achieved by effectively managing those elements of their activities, products and services that can significantly impact the environment.

This document sets out a process called environmental performance evaluation (EPE) which enables organizations to measure, evaluate and communicate their environmental performance using key performance indicators (KPIs), based on reliable and verifiable information.

EPE is equally applicable to small and large enterprises and may be used to support an environmental management system (EMS) or used independently. An organization with an EMS in place should assess its environmental performance against its environmental policy, objectives, targets and other environmental performance objectives.

Data and information generated by EPE can be used by an organization to implement other environmental management tools and techniques in a coherent, transparent and cost-effective way, e.g. in the ISO 14000 family of standards such as:

— EMS (see ISO 14001 and guidance in ISO 14004, ISO 14005 and ISO 14006);

— environmental declarations (see ISO 14025);

— environmental labelling (see ISO 14024);

— life cycle assessment (LCA) (see ISO 14040 and ISO 14044).

This document may also be used independently.

EPE and environmental audits are complementary tools that can be used to assess environmental performance and identify areas for improvement. The key aspects, and differences, of these tools are:

— EPE is an ongoing process of collection and assessment of data and information to provide a current evaluation of performance, as well as performance trends over time;

— environmental audits may be used to gather such data and information, either as part of EPE or as part of an EMS, to verify whether objectives and targets are being met;

— EMS audits are conducted periodically to verify conformity with specifications and compliance with legal and other requirements. Guidance on auditing management system standards (MSS) is provided in ISO 19011.

Environmental management — Environmental performance evaluation — Guidelines

1 Scope

This document gives guidelines for the design and use of environmental performance evaluation (EPE) within an organization. It is applicable to all organizations, regardless of type, size, location and complexity.

This document does not establish environmental performance levels. It is not intended for use for the establishment of any other environmental management system (EMS) conformity requirements.

The guidance in this document can be used to support an organization's own approach to EPE including its commitments to compliance with legal and other requirements, the prevention of pollution and continual improvement, among others.

NOTE This document is a generic standard and does not include guidance on specific methods for valuing or weighting different kinds of impacts in different kinds of sectors, disciplines, etc. Depending on the nature of the organization's activities, there is often a need to also go to other sources for additional information and guidance on sector-specific topics, different subject matters or different scientific disciplines.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1 Terms related to organization and leadership

3.1.1
management system
set of interrelated or interacting elements of an *organization* (3.1.4) to establish policies and *objectives* (3.2.5) and *processes* (3.3.2) to achieve those objectives

Note 1 to entry: A management system can address a single discipline or several disciplines (e.g. quality, *environment* (3.2.1), occupational health and safety, energy, financial management).

Note 2 to entry: The system elements include the organization's structure, roles and responsibilities, planning and operation, performance evaluation and improvement.

Note 3 to entry: The scope of a management system can include the whole of the organization, specific and identified *functions* (3.3.3) of the organization, specific and identified sections of the organization, or one or more functions across a group of organizations.

[SOURCE: ISO 14001:2015, 3.1.1]

3.1.2
environmental management system
EMS
part of the *management system* (3.1.1) used to manage *environmental aspects* (3.2.2), fulfil *compliance obligations* (3.2.12), and address *risks and opportunities* (3.2.9)

[SOURCE: ISO 14050:2020, 3.3.1]

3.1.3
environmental policy
intentions and direction of an *organization* (3.1.4) related to its *environmental performance* (3.4.10) as formally expressed by *top management* (3.1.5)

[SOURCE: ISO 14001:2015, 3.1.3]

3.1.4
organization
person or group of people that has its own *functions* (3.3.3) with responsibilities, authorities and relationships to achieve its *objectives* (3.2.5)

Note 1 to entry: The concept of organization includes, but is not limited to sole-trader, company, corporation, firm, enterprise, authority, partnership, charity or institution, or part or combination thereof, whether incorporated or not, public or private.

[SOURCE: ISO 14001:2015, 3.1.4]

3.1.5
top management
person or group of people who directs and controls an *organization* (3.1.4) at the highest level

Note 1 to entry: Top management has the power to delegate authority and provide resources within the organization.

Note 2 to entry: If the scope of the *management system* (3.1.1) covers only part of an organization, then top management refers to those who direct and control that part of the organization.

[SOURCE: ISO 14001:2015, 3.1.5]

3.2 Terms related to planning

3.2.1
environment
surroundings in which an *organization* (3.1.4) operates, including air, water, land, *natural resources* (3.2.10), flora, fauna, humans and their interrelationships

Note 1 to entry: Surroundings can extend from within an organization to the local, regional and global system.

Note 2 to entry: Surroundings can be described in terms of biodiversity, ecosystems, climate or other characteristics.

[SOURCE: ISO 14001:2015, 3.2.1]

3.2.2
environmental aspect
element of an *organization's* (3.1.4) activities or *products* (3.5.1) that interacts or can interact with the *environment* (3.2.1)

Note 1 to entry: Significant environmental aspects are determined by the organization applying one or more criteria.

[SOURCE: ISO 14001:2015, 3.2.2, modified — "or services" has been deleted from the definition. Note 1 to entry has been deleted and Note 2 to entry has been renumbered.]

3.2.3
environmental condition
state or characteristic of the *environment* (3.2.1) as determined at a certain point in time

[SOURCE: ISO 14001:2015, 3.2.3]

3.2.4
environmental impact
change to the *environment* (3.2.1), whether adverse or beneficial, including possible consequences, wholly or partially resulting from an *organization's* (3.1.4) *environmental aspects* (3.2.2)

[SOURCE: ISO 14050:2020, 3.2.22]

3.2.5
objective
result to be achieved

Note 1 to entry: An objective can be strategic, tactical, or operational.

Note 2 to entry: Objectives can relate to different disciplines (such as financial, health and safety, and environmental goals) and can apply at different levels (such as strategic, organization-wide, project, *product* (3.5.1), service and *process* (3.3.2)).

Note 3 to entry: An objective can be expressed in other ways, e.g. as an intended outcome, a purpose, an operational criterion, as an *environmental objective* (3.2.6), or by the use of other words with similar meaning (e.g. aim, goal, or target).

[SOURCE: ISO 14001:2015, 3.2.5]

3.2.6
environmental objective
objective (3.2.5) set by the *organization* (3.1.4) consistent with the *environmental policy* (3.1.3)

[SOURCE: ISO 14001:2015, 3.2.6]

3.2.7
requirement
need or expectation that is stated, generally implied or obligatory

Note 1 to entry: "Generally implied" means that it is custom or common practice for the *organization* (3.1.4) and interested parties that the need or expectation under consideration is implied.

Note 2 to entry: A specified requirement is one that is stated, for example in *documented information* (3.3.4).

Note 3 to entry: Requirements other than legal requirements become obligatory when the organization decides to comply with them.

[SOURCE: ISO 14001:2015, 3.2.8]

3.2.8
risk
effect of uncertainty

Note 1 to entry: An effect is a deviation from the expected – positive or negative.

Note 2 to entry: Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of, an event, its consequence, or likelihood.

Note 3 to entry: Risk is often characterized by reference to potential "events" (as defined in ISO Guide 73:2009, 3.5.1.3) and "consequences" (as defined in ISO Guide 73:2009, 3.6.1.3), or a combination of these.

Note 4 to entry: Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated "likelihood" (as defined in ISO Guide 73:2009, 3.6.1.1) of occurrence.

[SOURCE: ISO 14001:2015, 3.2.10]

3.2.9
risks and opportunities
potential adverse effects (threats) and potential beneficial effects (opportunities)

[SOURCE: ISO 14001:2015, 3.2.11]

3.2.10
natural resource
part of nature which provides benefits to humans or underpins human well-being

[SOURCE: ISO 14050:2020, 3.2.5]

3.2.11
prevention of pollution
use of *processes* (3.3.2), practices, techniques, materials, *products* (3.5.1), or energy to avoid, reduce or control (separately or in combination) the creation, emission or discharge of any type of pollutant or waste, in order to reduce adverse *environmental impacts* (3.2.4)

[SOURCE: ISO 14050:2020, 3.2.10]

3.2.12
compliance obligations (preferred term)
legal requirements and other requirements (admitted term)
legal *requirements* (3.2.7) that an *organization* (3.1.4) has to comply with and other requirements that an organization has to or chooses to comply with

Note 1 to entry: Compliance obligations are related to the *environmental management system* (3.1.2).

Note 2 to entry: Compliance obligations can arise from mandatory requirements, such as applicable laws and regulations, or voluntary commitments, such as organizational and industry standards, contractual relationships, codes of practice and agreements with community groups or non-governmental organizations.

[SOURCE: ISO 14001:2015, 3.2.9]

3.3 Terms related to support and operation

3.3.1
outsource, verb
make an arrangement where an external *organization* (3.1.4) performs part of an organization's *function* (3.3.3) or *process* (3.3.2)

Note 1 to entry: An external organization is outside the scope of the *management system* (3.1.1), although the outsourced function or process is within the scope.

[SOURCE: ISO 14001:2015, 3.3.4]

3.3.2
process
set of interrelated or interacting activities which transforms inputs into outputs

Note 1 to entry: A process can be documented or not.

[SOURCE: ISO 14001:2015, 3.3.5]

3.3.3
function
combination of *processes* (3.3.2), *products* (3.5.1) or services that achieve a specific, predetermined end, usually on a repetitive basis

3.3.4
documented information
information required to be controlled and maintained by an *organization* (3.1.4) and the medium on which it is contained

Note 1 to entry: Documented information can be in any format and media, and from any source.

Note 2 to entry: Documented information can refer to:

— the *environmental management system* (3.1.2), including related *processes* (3.3.2);

— information created in order for the organization to operate (can be referred to as documentation);

— evidence of results achieved (can be referred to as records).

[SOURCE: ISO 14001:2015, 3.3.2]

3.4 Terms related to performance evaluation and improvement

3.4.1
indicator
quantitative, qualitative or binary variable that can be measured or described, representing the status of operations, management, conditions or impacts

[SOURCE: ISO 14050:2020, 3.2.24]

3.4.2
key performance indicator
KPI
indicator (3.4.1) of *performance* (3.4.9) deemed by an *organization* (3.1.4) to be significant and giving prominence and attention to certain aspects of operations, management, conditions or impacts

[SOURCE: ISO 14050:2020, 3.2.25]

3.4.3
combined indicator
indicator (3.4.1) that includes information on more than one aspect of operations, management conditions or impacts

Note 1 to entry: A combined indicator may also be referred to as a composite indicator.

[SOURCE: ISO 14050:2020, 3.2.26, modified — Note 1 to entry has been added.]

3.4.4
environmental condition indicator
ECI
indicator (3.4.1) that provides information about the local, regional, national or global *environmental condition* (3.2.3)

Note 1 to entry: "Regional" may refer to a state, a province, or a group of states within a country, or it may refer to a group of countries or a continent, depending on the scale of the environmental conditions that the *organization* (3.1.4) chooses to consider.

[SOURCE: ISO 14050:2020, 3.2.32, modified — The abbreviated term and Note 1 to entry has been added.]

3.4.5
environmental performance indicator
EPI
indicator (3.4.1) that provides information about an *organization's* (3.1.4) *environmental performance* (3.4.10)

3.4.6
management performance indicator
MPI
environmental performance indicator (3.4.5) that provides information about the management efforts to influence an *organization's* (3.1.4) *environmental performance* (3.4.10)

[SOURCE: ISO 14050:2020, 3.2.30]

3.4.7
operational performance indicator
OPI
environmental performance indicator (3.4.5) that provides information about the *environmental performance* (3.4.10) of an *organization's* (3.1.4) operation

[SOURCE: ISO 14050:2020, 3.2.31]

3.4.8
benchmark
reference point against which comparisons can be made

Note 1 to entry: Benchmarking is the *process* (3.3.2) for making a comparison.

[SOURCE: ISO/IEC 29155-1:2017, 3.2, modified — Note 1 to entry has been replaced.]

3.4.9
performance
measurable result

Note 1 to entry: Performance can relate either to quantitative or qualitative findings.

Note 2 to entry: Performance can relate to the management of activities, *processes* (3.3.2), *products* (3.5.1) (including services), systems or *organizations* (3.1.4).

[SOURCE: ISO 14001:2015, 3.4.10]

3.4.10
environmental performance
performance (3.4.9) related to the management of *environmental aspects* (3.2.2)

Note 1 to entry: For an *environmental management system* (3.1.2), results can be measured against the *organization's* (3.1.4) *environmental policy* (3.1.3), *environmental objectives* (3.2.6) or other criteria, using *indicators* (3.4.1).

[SOURCE: ISO 14001:2015, 3.4.11]

3.4.11
environmental performance evaluation
EPE
process (3.3.2) to facilitate management decisions regarding an *organization's* (3.1.4) *environmental performance* (3.4.10) by selecting *indicators* (3.4.1), collecting and analysing data, assessing information against environmental performance criteria, reporting and communicating, and periodically reviewing and improving this process

[SOURCE: ISO 14050:2020, 3.2.28]

3.4.12
audit
systematic, independent and documented *process* (3.3.2) for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled

Note 1 to entry: An internal audit is conducted by the *organization* (3.1.4) itself, or by an external party on its behalf.

Note 2 to entry: An audit can be a combined audit (combining two or more disciplines).

Note 3 to entry: Independence can be demonstrated by the freedom from responsibility for the activity being audited or freedom from bias and conflict of interest.

Note 4 to entry: "Audit evidence" consists of records, statements of fact or other information which are relevant to the audit criteria and are verifiable; and "audit criteria" are the set of policies, procedures or *requirements* (3.2.7) used as a reference against which audit evidence is compared, as defined in ISO 14050:2020, 3.4.44 and 3.4.45 respectively.

[SOURCE: ISO 14001:2015, 3.4.1, modified — "as defined in ISO 14050:2020, 3.4.44 and 3.4.45" has replaced "as defined in ISO 19011:2011, 3.3 and 3.2" in Note 4 to entry.]

3.4.13
conformity
fulfilment of a *requirement* (3.2.7)

[SOURCE: ISO 14001:2015, 3.4.2]

3.4.14
nonconformity
non-fulfilment of a *requirement* (3.2.7)

[SOURCE: ISO 14001:2015, 3.4.3, modified — Note 1 to entry has been deleted.]

3.4.15
corrective action
action to eliminate the cause of a *nonconformity* (3.4.14) and to prevent recurrence

Note 1 to entry: There can be more than one cause for a nonconformity.

[SOURCE: ISO 14001:2015, 3.4.4]

3.4.16
continual improvement
recurring activity to enhance *performance* (3.4.9)

Note 1 to entry: Enhancing performance relates to the use of the *environmental management system* (3.1.2) to enhance *environmental performance* (3.4.10) consistent with the *organization's* (3.1.4) *environmental policy* (3.1.3).

Note 2 to entry: The activity need not take place in all areas simultaneously, or without interruption.

[SOURCE: ISO 14001:2015, 3.4.5]

3.4.17
monitoring
determining the status of a system, a *process* (3.3.2) or an activity

Note 1 to entry: To determine the status, there might be a need to check, supervise or critically observe.

[SOURCE: ISO 14001:2015, 3.4.8]

3.4.18
measurement
process (3.3.2) to determine a value

[SOURCE: ISO 14001:2015, 3.4.9]

3.5 Terms relating to product system

3.5.1
product
any goods or service

Note 1 to entry: In some *environmental management system* (3.1.2) standards, e.g. ISO 14001:2015, the term "product" does not include service.

Note 2 to entry: When using the term "product" to not include service, this needs to be expressed explicitly.

[SOURCE: ISO 14050:2020, 3.5.12, modified — Notes 1 and 2 to entry have been added.]

3.5.2
product system
collection of *unit processes* (3.6.4) with *elementary flows* (3.6.5) and *product flows* (3.5.3), performing one or more defined *functions* (3.3.3) and which models the *life cycle* (3.6.1) of a *product* (3.5.1)

[SOURCE: ISO 14050:2020, 3.5.1]

3.5.3
product flow
products (3.5.1) entering from or leaving to another *product system* (3.5.2)

[SOURCE: ISO 14050:2020, 3.5.3]

3.5.4
raw material
primary or secondary material that is used to produce a *product* (3.5.1)

[SOURCE: ISO 14050:2020, 3.5.18]

3.6 Terms relating to life cycle assessment

3.6.1
life cycle
consecutive and interlinked stages related to a *product system* (3.5.2), from *raw material* (3.5.4) acquisition or generation from *natural resources* (3.2.10) to end-of-life treatment

[SOURCE: ISO 14050:2020, 3.6.1]

3.6.2
life cycle assessment
LCA
compilation and assessment of the inputs, outputs and the potential *environmental impacts* (3.2.4) of a *product system* (3.5.2) throughout its *life cycle* (3.6.1)

[SOURCE: ISO 14050:2020, 3.6.2]

3.6.3
life cycle inventory analysis
phase of *life cycle assessment* (3.6.2) involving the compilation and quantification of inputs and outputs for a *product* (3.5.1) throughout its *life cycle* (3.6.1)

[SOURCE: ISO 14050:2020, 3.6.3]

3.6.4
unit process
smallest element considered in the *life cycle inventory analysis* (3.6.3) for which input and output data are quantified

[SOURCE: ISO 14050:2020, 3.6.9]

3.6.5
elementary flow
material or energy entering the system being studied that has been drawn from the *environment* (3.2.1) without previous human *transformation* (3.6.6), or material or energy leaving the system being studied that is released into the environment without subsequent human transformation

[SOURCE: ISO 14050:2020, 3.6.12]

3.6.6
transformation
change in the fundamental attributes of natural and human systems

[SOURCE: ISO 14050:2020, 3.8.26]

4 Environmental performance evaluation

4.1 General overview

4.1.1 EPE process

EPE is a management process that uses KPIs to compare an organization's past and present environmental performance with its environmental objectives and targets. The information generated by EPE can help an organization to:

— identify its environmental aspects and determine which aspects it will treat as significant;

— set objectives and targets for improving environmental performance and assess performance against these objectives and targets;

— identify opportunities for better management of its environmental aspects;

— identify trends in its environmental performance;

— review and improve efficiency and effectiveness;

— identify strategic opportunities;

— evaluate compliance or risk of non-compliance with compliance obligations to which the organization subscribes related to its environmental aspects;

— report and communicate environmental performance internally and externally.

Management commitment to EPE is essential and should be part of the regular business functions and activities of an organization. EPE should be appropriate to the size, location and type of organization, and its needs and priorities.

Internally, EPE can help the organization to achieve its environmental performance objectives and targets and also to enlist the involvement of an EMS. EPE can also be used to report and communicate information on the organization's environmental performance to external interested parties to demonstrate its commitment to improvement.

EPE, as detailed in this document, follows a Plan-Do-Check-Act (PDCA) management model. The steps of this ongoing process are as follows:

a) Plan: preparing to implement performance evaluation:

   1) planning EPE;

2) selecting indicators for EPE (the process of selecting indicators for objectives and targets may include both choosing from existing indicators and developing new indicators);

b) Do: managing data and information, which includes:

1) collecting data relevant to the selected indicators (for guidance on data collection, see ISO 14033);

2) analysing and converting data into information describing the organization's environmental performance;

3) assessing information describing the organization's environmental performance in comparison with the organization's environmental performance objectives;

4) reporting and communicating information describing the organization's environmental performance;

c) Check and Act:

1) reviewing and improving EPE.

4.1.2 Indicators for EPE

4.1.2.1 General

This document describes two categories of indicators for EPE:

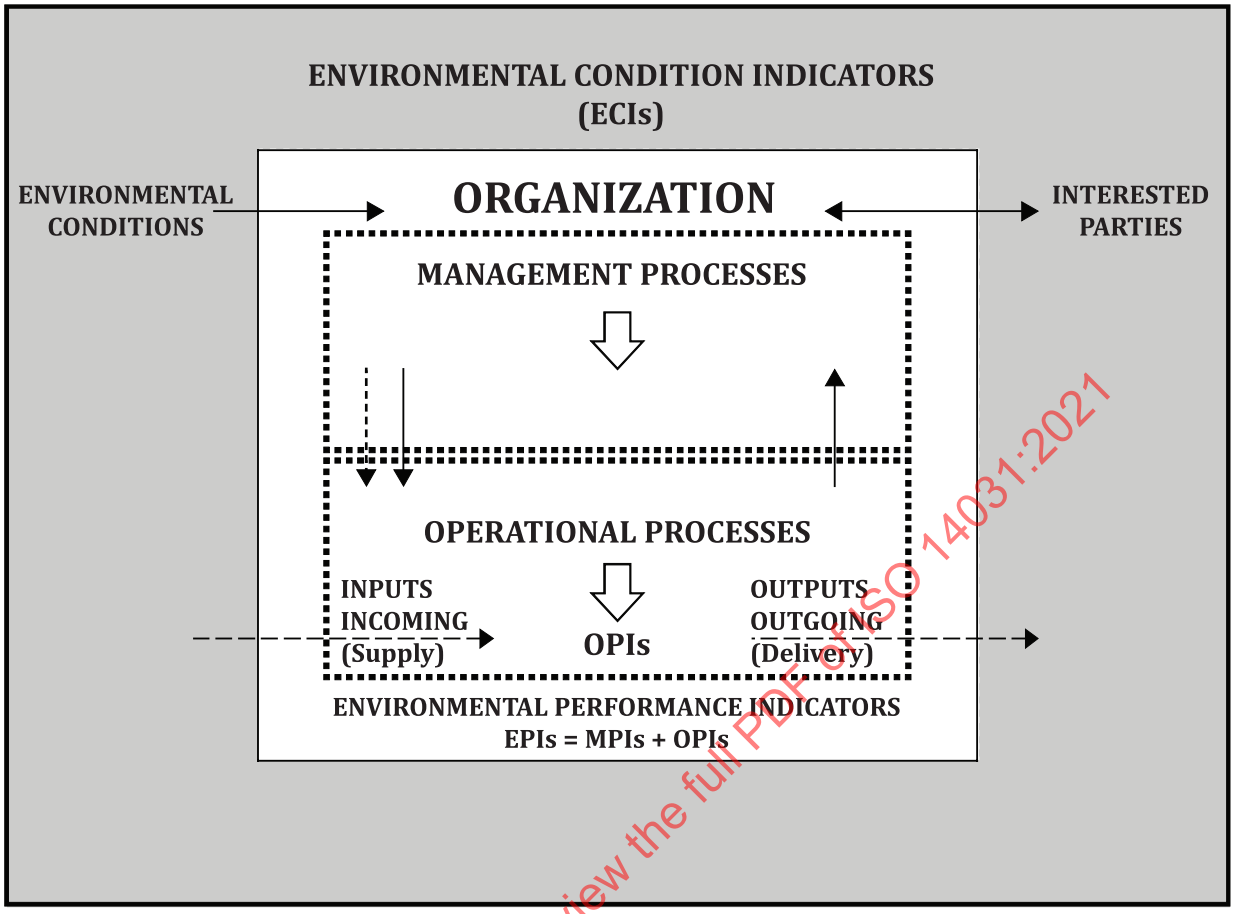
— Environmental condition indicators (ECIs) provide information about the environmental condition which could be impacted by the organization. This information can help an organization to better understand the actual impact or potential impact of its environmental aspects (e.g. process emissions). ECIs are often difficult to link directly to one organization's operations unless they are the only source emitting a particular pollutant. Care should be taken to account for any other sources or factors that might have similar impacts on the environment. ECIs can be used (e.g. by regulators or other local government agencies) to calculate condition baselines, monitor trends, establish permit limits for pollutants and create incentives.

— Environmental performance indicators (EPIs) provide information related to the organization's management of its significant environmental aspects and demonstrate the results of its environmental management programmes. These may be KPIs that an organization chooses to use for general business purposes.

  — Management performance indicators (MPIs) provide information about management efforts to influence the environmental performance of the organization's management.

  — Operational performance indicators (OPIs) provide information about the environmental performance of the organization's operations.

Figure 1 illustrates the interrelationships among an organization's management, operations and the environmental conditions, noting the type of indicator in brackets for EPE related to each of these elements.



Key

information flows: ——→

input and output flows related to the organization's operations: – – – –→

decision flows: -------→

Figure 1 — Understanding the organization and its context

4.1.2.2 Relating EPE indicators to environmental, social and economic aspects of sustainability

EPIs and ECIs can be used to demonstrate how an organization addresses the three dimensions of sustainability (social, economic and environmental) through the management of its significant environmental aspects.

MPIs can show improvements in the social dimension (e.g. indicators that show how training is being done or will be done so as to improve certain environmental aspects) or in the economic dimension (e.g. investments on new technologies so as to address environmental aspects and cost savings due to improved environmental performance).

OPIs can be linked to the context of the environment (e.g. emission reductions, reduction in the use of energy and water resources).

ECIs might not be linked directly with the organization's processes but in certain instances can be linked to the success of its environmental management which itself can reflect on all three dimensions of sustainability. For example:

— improved quality of water resources (environmental);

— improved quality of life: more people having access to drinking water (social);

— reduced costs for obtaining drinking water (economic).

The decisions and actions of an organization's management are closely related to the performance of its operations. Figure 2 provides an outline of EPE, with references to the numbers and titles of relevant subclauses in this document. Annex A provides supplemental guidance to support EPE.

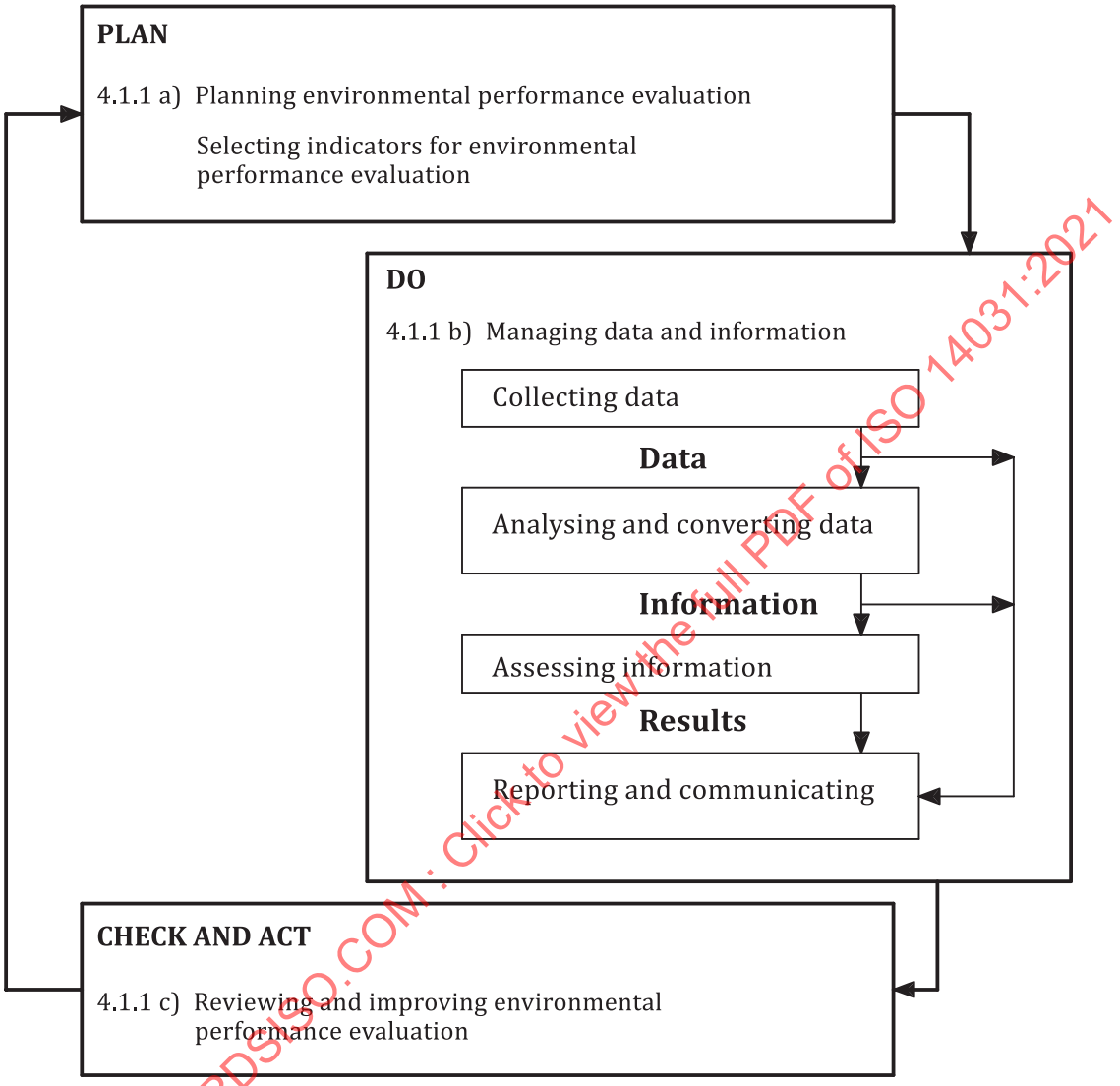


Figure 2 — Outline of EPE, which follows the PDCA model

4.1.3 EPE principles

EPE principles for performance information include:

— relevance: performance information should be relevant to the organization's efforts to manage its environmental aspects;

— completeness: performance information should be complete to ensure that all factors will be addressed;

— consistency and accuracy: performance information should be consistent and accurate to allow valid comparisons of past, present and future performance;

— transparency: performance information should be clear and transparent so that the intended users have access and understanding of performance data to make decisions with reasonable confidence.

4.2 Planning EPE (Plan)

4.2.1 General guidance

4.2.1.1 General

KPIs are selected by organizations as a means of presenting quantitative or qualitative data or information in a more understandable and useful form. They help to convert relevant data into concise information about management's efforts to influence the environmental performance of its operations or the environmental conditions. An organization should select a sufficient number of relevant and understandable indicators to evaluate its environmental performance and reflect the nature and scale of the organization's operations as well as their environmental impacts. The choice of indicators for EPE will determine what data should be used. To facilitate this effort, organizations can use data already available and collected by the organization or by others.

4.2.1.2 Applying EPE to those organizations with or without an EMS

An organization with an EMS in place should evaluate its environmental performance against its environmental policy, objectives and targets, and applicable compliance obligations. Whether it has an EMS or not, an organization should plan EPE in conjunction with the setting of its environmental performance goals, so that the selected indicators for EPE will be appropriate for describing the organization's environmental performance against these goals.

Practical Help Box 1

This box provides examples of approaches to identify environmental aspects and their relative significance in the context of EPE:

— identify activities, products and services of the organization, the specific environmental aspects and the relative significance associated with them, and the potential impacts related to significant environmental aspects;

— use information about the environmental condition to identify activities, products and services of the organization that can have an impact on specific conditions;

— analyse the organization's existing data on material and energy inputs, discharges, wastes and emissions, and evaluate these data in terms of risk;

— identify the views of interested parties and use this information to help establish the organization's significant environmental aspects;

— identify activities of the organization that are subject to environmental regulation or other requirements, for which data could have been collected by the organization;

— consider the design, development, manufacturing, distribution, servicing, use, re-use, recycling and disposal of the organization's products, and their related environmental impacts;

— identify those activities of the organization having the most significant environmental costs or benefits, including outsourced activities or processes.

4.2.2 Characteristics of EPE indicators

4.2.2.1 General overview

The information conveyed through indicators for EPE can be expressed as direct or relative measures or as indexed information. Indicators for EPE may be aggregated or weighted as appropriate to the nature of the information and its intended use. Aggregation and weighting should be done with care to ensure

verifiability, consistency, comparability and understanding. There should be a clear understanding of assumptions made in the handling of data and its transformation into information and indicators for EPE.

Practical Help Box 2

This box provides examples of data characteristics for EPE indicators:

— direct measures or calculations: basic data or information, such as tonnes of contaminant emitted;

— relative measures or calculations: data or information compared to or in relation to another parameter (e.g. production level, time, location or background condition), such as tonnes of contaminant emitted per tonne of product manufactured, or tonnes of contaminant emitted per unit of sales turnover;

— indexed to a reference point: describing data or information converted to units or to a form which relates the information to a chosen standard or baseline, such as contaminant emissions in the current year expressed as a percentage of those emissions in a baseline year;

— aggregated: describing data or information of the same type, but from different sources, collected and expressed as a combined value, such as total tonnes of a given contaminant emitted from production of a product in a given year, determined by summing emissions from multiple facilities producing that product;

— weighted: describing data or information modified by applying a factor related to its significance.

4.2.2.2 Understanding relationships between different measures of performance

Indicators for EPE should be selected so that management has sufficient information to understand the effect that any one environmental performance objective has on other elements of the organization's operations.

Organizations can find it cost effective to select indicators derived from a common set of data, or to use combined indicators which include information on more than one aspect. It is therefore important to ensure that the information on different aspects of such an indicator can easily be extracted and communicated to the intended audience.

Combined indicators can include information on a group of aspects [e.g. from the indicator "litres of diesel/t-km" for transports, one can calculate data on emissions of greenhouse gas (GHG) and other pollutants].

Practical Help Box 3

This box provides an example to illustrate an organization selecting several indicators for EPE derived from a common set of data, depending on the intended audiences.

An organization discharging treated wastewater to a lake selects the following indicators for EPE:

— total amount of specific contaminant discharged per year (possible intended audience: the local community);

— concentration of contaminant in wastewater (possible intended audience: legal and regulatory authorities);

— amount of contaminant discharged per product produced (possible intended audiences: management and consumers);

— change in amount of contaminant discharged per year relative to investments in cleaner technology or process upgrade (possible intended audiences: management and investors).

Regional, national and global condition indicators related to environmental performance or sustainable development are being developed by government agencies, non-governmental organizations, and scientific and research institutions. When selecting indicators for EPE and collecting data, organizations may wish to consider indicators being developed by such entities and compatibility with information which is provided to them.

4.2.2.3 Selecting management performance indicators

In the context of EPE, the management of the organization includes the policies, people, planning activities, practices and procedures at all levels of the organization, as well as the decisions and actions associated with the organization's environmental aspects. Efforts and decisions undertaken by the organization's management can affect the performance of the organization's operations, and therefore can contribute to the overall environmental performance of the organization (see Figure 1).

MPIs should provide information on the organization's capability and efforts in managing matters such as training, compliance obligations, resource allocation and efficient utilization, environmental cost management, purchasing, product development, documented information or corrective action which have or can have an influence on the organization's environmental performance. MPIs should assist in evaluating management's decisions and actions to improve environmental performance.

For example, MPIs can be used to track:

— senior level commitment to environmental management;

— management's understanding of the relevance of environmental management to the organization's mission;

— the effectiveness of policies and programmes;

— resources to implement policies and programmes linked to the organization's mission;

— the degree of engagement with external interested parties (e.g. local communities) on environmental issues;

— changes in roles and responsibilities within the organization;

— supply chain activities and performance;

— how end users of products and services are influenced;

— continual improvement of systems and performance;

— compliance with legal, regulatory and other requirements to which the organization subscribes;

— benefits and costs to the organization from environmental management.

In addition, effective MPIs can help to:

— predict changes in performance;

— identify root causes where actual performance exceeds, or does not meet, relevant environmental performance objectives;

— identify opportunities for preventive action.

Examples of MPIs are provided in A.4.2.2.

4.2.2.4 Selecting operational performance indicators

OPIs provide management with information on the environmental performance of the organization's operations. OPIs can be identified by listing the organization's inputs, operational processes and equipment, and outputs, as shown in Figure 3.

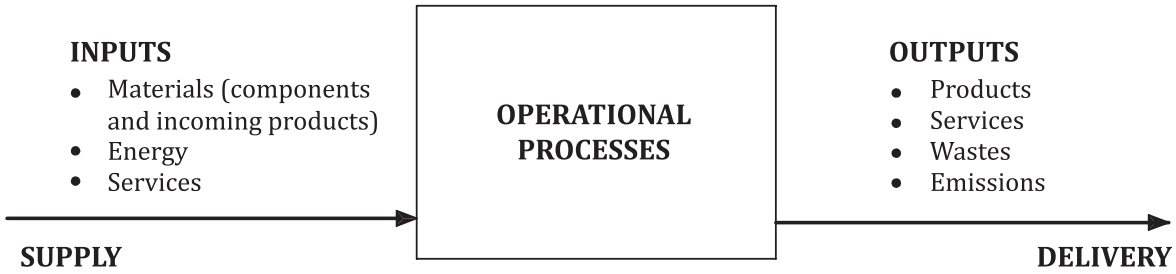


Figure 3 — The organization's operations (general overview)

Services may be inputs, operational processes or outputs, and can have significant environmental impacts (e.g. distribution).

NOTE A mass balance or input/output analysis can be performed for the whole company, or for selected processes, services or equipment, as well as for all or single products, depending on the quality of the information systems and company needs.

OPIs can be selected from the following categories and subcategories:

— components, incoming products (e.g. reused, new) and services (direct and indirect);

— raw and auxiliary materials, which are intended to become products as well as operating materials, which assist running the processes, e.g. cleaning materials and lubricants;

— services supporting the organization's operations (e.g. direct, indirect);

— operational processes (e.g. design of processes, operational efficiency, maintenance);

— physical facilities and equipment (e.g. design, installation, operation, maintenance, land use);

— components and outgoing products and services (e.g. design, environmental impact, by-products, used products, distribution);

— waste (e.g. hazardous, non-hazardous);

— emissions (e.g. hazardous vapours, nuisance, GHGs, ozone-depleting substances, dust, noise, heat, thermal energy, effluent to water or land).

Examples of OPIs are provided in A.4.3.2 of this document.

4.2.2.5 Selecting environmental condition indicators

ECIs provide information about the local, regional, national or global environmental conditions, over time or with specific events. While ECIs may not be direct measures of impact on the environment, ECIs can provide useful information on the environmental outcomes of changes to an organization's activities, products and services. ECIs can be developed for environmental categories (e.g. air, water, land, flora, fauna, humans, aesthetics, heritage and culture including special indicators for biodiversity or ecosystem services).

ECIs provide the organization with an environmental context to support:

— the establishment of a baseline against which to measure change;

— the identification and management of its significant environmental aspects;

— the assessment of the appropriateness of environmental performance objectives;

— the selection of EPIs (MPIs and OPIs);

— the determination of environmental change over time in relation to an ongoing environmental programme;

— the investigation of possible relationships between environmental condition and the organization's activities, products and services;

— the determination of needs for action.

Development and application of ECIs is frequently the function of local, regional, national or international government agencies, non-governmental organizations, and scientific and research institutions rather than the function of an individual business organization. However, organizations that can identify a relationship between their activities and the condition of some component of the environment may choose to develop their own ECIs as an aid in evaluating their environmental performance as appropriate to their capabilities, interests and needs.

An organization that has identified a specific environmental condition that results directly from its own activities, products and services may wish to select EPIs (MPIs and OPIs) that link management efforts and operational performance to changes in environmental conditions.

Examples of ECIs are provided in A.4.4.2.

Practical Help Box 4

This box provides examples to illustrate an identified environmental issue with selected linked indicators for EPE.

EXAMPLE 1

Indicators for EPE:

— concentration of particulates;

— concentration in the air of contaminants associated with motor vehicle emissions (CO, HC and NOx).

MPIs:

— amount of money spent promoting public transportation and its use;

— number of hours of employee training in the benefits of the use of public transportation;

— effectiveness of efforts to reduce fuel consumption, improve vehicle maintenance and fuel efficiency, and use alternative fuels.

OPIs:

— reduction in motor vehicle emissions attributed to the use of alternative fuels;

— quantity of total fuels consumption;

— fuel efficiency by motor vehicle;

— frequency of vehicle maintenance;

— number of vehicles equipped with environmental control technologies.

EXAMPLE 2

In a geographical region where environmental information indicates a diminishing water supply, an organization may select indicators for EPE related to water conservation measures which it would not have chosen without that information.

ECIs:

— groundwater level;

— rate of replenishment.

MPI:

— amount of money spent on research into methods for reduction of water consumption.

OPIs:

— quantity of water used per day;

— quantity of water used per unit of production.

4.2.2.6 Selecting sector-specific operational performance indicators for comparison

OPIs are typically expressed in terms of quantities per unit of time (e.g. total energy per year) relating to an entire organization or to its sub-units. Though these indicators offer insight into each individual entity, different organizations vary in size, product range, resource inputs, production processes and in many other ways so that comparisons of their performance are not normally possible by directly comparing their environmental aspects as represented by OPIs.

Similarly, while monitoring OPIs over a period of time can identify performance trends for an organization, increases or decreases of environmental burdens are not necessarily related to performance changes alone, but can be due to other reasons such as organizational expansion/reduction of production or outsourcing/relocations of certain activities. Hence, even internal performance comparisons within the same organization present difficulties that need to be taken into account when doing comparisons.

By contrast, comparisons can be made of the environmental efficiency of particular activities within processes or products (e.g. quantity of energy per product unit). These relative values will allow (under specific, controlled conditions) qualified comparisons of processes, products or services from different organizations, as well as for the identification of benchmarks, and best and worst practices or ratings.

Any meaningful comparison of performance should be based on the same function. A methodology to develop comparable environmental indicators will have to focus on processes, products or services at a sector (or even sub-sector) or functional level. Such methods are usually established through joint effort that include industry sectors, standards setting bodies and governmental institutions rather than by an individual organization.

Often, the environmental aspects compared need to include those of the whole life cycle of a product such as raw material acquisition/processing and the use/consumption of the product. Automobile use, for example, is of far greater importance in calculating the total life cycle CO_2 burden than is its production stage. Furthermore, comparisons can be made easier by focusing only on the most significant aspects: the KPIs. For example, the average consumption of its fleet is by far the most important indicator of an automobile company's environmental aspects.

Practical Help Box 5

The methodology can be used to develop sector-specific environmental indicators. These are indicators for unit comparisons. Comparisons of the overall environmental performance of entire organizations is normally difficult or even impossible to achieve.

— Clearly identify the process, product or service of interest with an appropriate level of detail to ensure the comparison is based on the same function.

— Identify the significant environmental aspects associated with the process, product or service.

  — Start by finding existing generic sector or sub-sector indicator listings, descriptions of state-of-the-art technologies or eco-label criteria, studies, scientific publications, regulatory requirements, media reports, public perceptions, etc. that provide clues to significant aspects and impacts.

  — Include life cycle data, particularly where environmental aspects and impacts occur outside the organization (e.g. destruction of biodiversity during raw material extraction or during the use stage).

  — Seek consensus among materially interested parties on the environmental impacts on which the comparison is to be based. Determine whether values will be weighted, aggregated into a single score or left separately as an ingredient list where respective values for each indicator type are compared to each other. Different methods (such as scoring and ranking systems) can be used for this comparison and need to be agreed upon by the parties involved. For most processes, products and services, three to ten indicators will usually suffice to establish a sound basis for comparison.

— Metrics need to be chosen carefully to accurately value the indicators. Some examples include:

  — production: energy consumption per tonne cement produced;

  — fuel burning: CO_2 per kWh electricity;

  — usage: water/electricity consumption of a washing machine per standard wash;

  — consumption: paper consumption per employee;

  — consumption: annual energy consumption per square metre of floor space.

In some cases, percentages or yes/no indicators (e.g. absence of certain chemicals/dangerous substances) can also be appropriate and useful.

— While some processes need only to consider a single stage (car emissions, for example, occur mainly in the use stage), others (such as CO_2 emissions from cement manufacturing) include the life cycle stages of quarrying, grinding raw materials, clinker production, grinding cement and storage/transport. This requires a cradle-to-gate life cycle evaluation. More complex systems could require the combination of processes relating to several products or services.

— Data collection and data quality, including quantification algorithms, need to be well defined. This includes assigning responsibilities for collecting the data, precise definition of the kind and format of data needed, measurement and test procedures, quality assurance and verification, averaging, time coverage, conversion factors, credits and deductions, and other aspects.

NOTE ISO 14033 provides guidance for the acquisition and provision of quantitative environmental information to establish good data quality and data comparability.

— The rules for reporting the results of comparisons should include at least the following elements:

  — a description of the indicator, including units (e.g. kg CO_2-emissions per tonne cement from cradle to factory gate);

  — a sound rationale for the indicator and its relevance;

  — the time coverage (e.g. calendar year, fiscal year, results for one or several subsequent years);

  — the geographical coverage (site, country, region, global);

  — an explanation of other relevant aspects relating to organizational and indicator boundaries;

  — assessment of uncertainty of results.

— When establishing scales and benchmarks, the following factors should be taken into account:

  — geographical coverage (site, country, region, global);

  — existing legal or best practice reference documented information;

  — existing indicator systems (e.g. developed for industry/sub-sectors);

  — an assessment of the minimum/maximum indicator levels measured or observed at a given time;

  — the format and graphical representation including the number of levels, graded scales, colour/letter codes, etc.

— Both the indicator results and the rules for the (sub-)sector indicators should be regularly reviewed and, where appropriate, updated and revised. The period for review should be predefined.

Practical Help Box 6

This box provides simplified examples of comparable indicators.

Retail banks:

— function defined: money exchange, account management, granting credits;

— significant environmental aspects identified: energy consumption, CO_2 emissions, overall paper consumption, IT waste, travel;

— significant environmental aspect (randomly) selected: overall paper consumption;

— metrics defined:

  — normalized reference value (functional unit): per full time employee (FTE) per year;

  — percentage of recycled paper to overall paper consumed;

  — indicators for comparison: kg paper per FTE per year and percentages of recycled paper to overall paper consumed;

— boundaries defined:

  — organizational: including office-based activities in one country, excluding operations in other countries and marketing materials;

  — life cycle stages: overall paper consumed;

— data collection and calculation rules: described in retail bank procedures;

— reporting rules: paper consumption expressed in kg per FTE covering overall consumption, including the percentage of chlorine-free, recycled and certified eco-labelled paper according to retail bank procedures;

— benchmarking: comparison of data of previous three years performance ranked against industry sector top performers.

Cement production:

— function defined: production of cement;

— significant environmental aspects identified: resource extraction, energy consumption, CO_2 emissions, emissions of other pollutants (NOx, SO2, particulate matter), protection and mitigation of biodiversity concerns;

— significant environmental aspect (randomly) selected: CO_2 emissions;

— metrics defined:

  — normalized reference value (functional unit): per tonne cement;

  — indicator for comparison: kg CO_2 per tonne cement;

— boundaries defined:

  — organizational: production facilities in all European countries including all cradle-to-gate operations outside the organizational boundaries;

  — life cycle stages: quarrying, grinding raw materials, clinker production, grinding of cement and storage/transport;

— data collection and calculation rules: described in cement industry guidance;

— reporting rules: CO_2 emission expressed in kg per tonne cement covers all CO_2 emissions from cradle to gate according to cement industry guidance;

— benchmarking: comparison of data of previous three years' performance ranked against industry sector top performers.

4.3 Using data and information (Do)

4.3.1 Overview

The information generated by EPE can assist an organization to:

— determine any necessary actions to achieve its environmental performance objectives;

— identify significant environmental aspects;

— identify opportunities for better management of its environmental aspects (e.g. prevention of pollution);

— identify trends in its environmental performance;

— increase the organization's efficiency and effectiveness;

— identify strategic opportunities.

Internal reporting and communication of information describing the organization's environmental performance is important to assist employees in fulfilling their responsibilities, thereby enabling the organization to achieve its environmental performance objectives and also to enlist the involvement of its employees in the implementation, maintenance and improvement of environmental performance. Management may also commit or be required to report or communicate such information to other (internal and external) interested parties.

An organization's EPE should be reviewed periodically to identify opportunities for improvement of the EPE process.

An organization should collect data regularly to provide input for calculating values for selected indicators for EPE. Data should be collected systematically from appropriate sources at frequencies consistent with EPE planning. The data to be considered needs to be relevant and reliable.

Data generated for performance evaluation can also be coherent, transparent and cost effective for use in the implementation of other environmental management tools and standards. This is particularly true for those standards that rely on data derived from a physical mass balance of the organization's operational system.

Figure 4 illustrates the steps for using data and information to evaluate environmental performance. These steps are further described in 4.3.2 to 4.3.5.

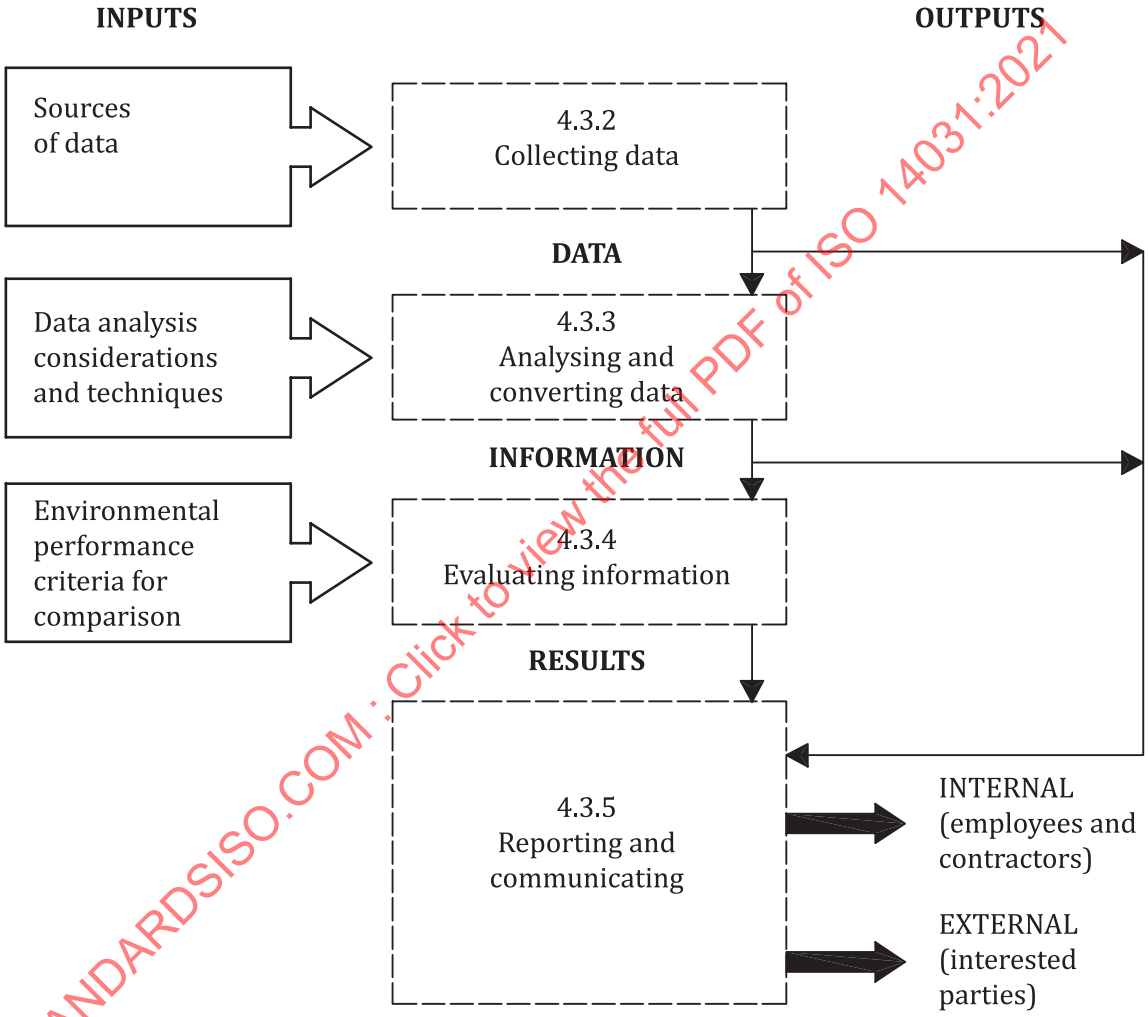


Figure 4 — Using data and information

4.3.2 Collecting data

Data collection procedures should ensure data reliability; this depends on factors such as availability, adequacy, scientific and statistical validity, and verifiability. Data collection should be supported by quality control and quality assurance practices that ensure the data obtained are of the type and quality needed for EPE use. Data collection procedures should include the appropriate identification, filing, storage, retrieval and disposition of data and information (see ISO 14040). Guidance for data collection and provision is given in ISO 14033.

An organization may use data from its EMS or from other sources. For example, data sources could include:

— interviews and observations;

— documented information (e.g. monitoring, measuring, inventory, production, financial, accounting, purchasing, training, emergency situations, compliance and incident records);

— reports (e.g. reviews, audits, assessments, scientific studies);

— government agencies, academic institutions and non-governmental organizations;

— suppliers and subcontractors;

— customers, consumers and interested parties;

— business associations;

— other management systems (e.g. quality, occupational health and safety, information, security);

— corrective and preventive measures;

— risk assessment;

— permits and licences;

— innovations.

4.3.3 Analysing and converting data

The collected data should be analysed and converted into information describing the organization's environmental performance, expressed as indicators for EPE. To avoid bias in the results, all relevant and reliable data that have been collected should be considered (see ISO 14033).

Organizations that have developed other recognized programmes (e.g. environmental product declarations) can use this information in EPE without the need for further analysis or conversion of data (see ISO 14025).

Data analysis may include consideration of the data quality, validity, adequacy and completeness necessary to produce reliable information.

Statistical tools may be used to increase the reliability of decisions on whether or not a certain objective was achieved. These tools may include, as appropriate, graphical techniques, indexing, aggregating or weighting.

4.3.4 Evaluating information (Review)

Whether it has an EMS or not, an organization should plan EPE in conjunction with the setting of its environmental performance objectives, so that the selected indicators for EPE will be appropriate for describing the organization's environmental performance against these objectives. All objectives and targets should have corresponding performance indicators.

Examples of sources from which environmental performance objectives can be derived include:

— current and past performance;

— compliance obligations;

— recognized codes, standards and best practices;

— performance data and information developed by industry and other sector organizations;

— management reviews and audits;

— the views of interested parties;

— scientific research.

The information derived from performance data, expressed in terms of OPIs, and possibly ECIs, should be compared with the organization's environmental performance objectives. Statistical tools such as test hypothesis or other comparison methods can be helpful for these comparisons. Comparisons may indicate progress or deficiencies in environmental performance. Comparisons may also be useful in understanding why the environmental performance objectives have, or have not, been met. The information describing the organization's environmental performance and the results of comparisons should be reported to management, to support appropriate management actions to improve or sustain the level of environmental performance.

4.3.5 Reporting and communicating

4.3.5.1 General guidance

Environmental performance reporting and communicating provides useful information describing an organization's environmental performance improvements and achievements (see ISO 14063). This information may be reported or communicated to interested parties within and outside the organization, based on management's assessment of needs and its audiences. Communicating environmental performance should be part of the organization's communication plan.

Benefits of reporting and communicating environmental performance can include:

— helping the organization's achievement of its environmental performance objectives;

— increasing awareness and dialogue about the organization's environmental policies, environmental performance objectives and relevant achievements;

— demonstrating the organization's commitment and efforts to improving environmental performance;

— providing the mechanism to respond to concerns and questions about the organization's environmental aspects.

4.3.5.2 Internal reporting and communicating

Management should ensure that appropriate and necessary information describing the organization's environmental performance is communicated throughout the organization on a timely basis (see ISO 14063). This can assist employees, contractors, and others related to the organization to fulfil their responsibilities, and the organization to meet its environmental performance objectives. An organization may wish to consider this information in the review of its EMS.

Examples of information describing the organization's environmental performance can include:

— trends in the organization's environmental performance (e.g. waste reduction);

— regulatory compliance;

— the organization's conformity with other requirements to which it subscribes;

— natural resources availability and other operational results;

— cost savings or other financial results;

— opportunities and risks.

4.3.5.3 External reporting and communicating

Organizations today are asked or might be required to issue environmental reports or statements providing information describing their environmental performance to external interested parties (see

ISO 14063). EPE provides information that an organization may wish to include in its environmental reports or in other communications with external audiences.

A number of factors can influence an organization's decision to voluntarily report information describing its environmental performance. These factors can include an organization's interest in improving its business position and relations with interested parties, including the communities in which it operates.

This communication should be a reliable representation of the organization's environmental performance. Information describing the organization's environmental performance should be substantive and presented in a manner that recognizes the level of technical knowledge of the intended audience. When an organization chooses to conduct external communications, the reporting and communicating methods selected should encourage communication between the organization and interested parties.

Practical Help Box 7

This box provides examples of information an organization can choose to include when reporting or communicating to external interested parties:

— statement of the organization's commitment to EPE as part of environmental management;

— compliance with legal and other requirements;

— statement of its achievements including management and environmental improvements;

— description of its activities, products and services;

— statement of its significant environmental aspects (e.g. GHGs) and related indicators for EPE;

— information relative to its environmental performance objectives (e.g. GHGs);

— actions arising from EPE to achieve management and environmental improvements;

— contribution of environmental management and EPE to the overall success of the organization.

4.4 Reviewing and improving EPE (Act)

An organization's EPE should be reviewed periodically to identify opportunities for improvement. Such a review may contribute to management actions to improve the performance of the management and operations of the organization, and can result in improvements to the environmental conditions.

For those organizations that have implemented an ISO 14001 EMS, recommendations to improve EPE should be included in the management review. Others should also provide for management's review of EPE data. Any periodic review should examine improvements or potential for improvements in:

— costs versus benefits achieved;

— progress towards environmental objectives and targets;

— progress towards environmental performance improvements (e.g. using benchmarking);

— use of selected indicators for EPE;

— data sources, collection methods and quality;

— information from interested parties;

— changes in compliance obligations, best practices and best available techniques;

— processes, products, services and discharges to the environment.

Practical Help Box 8 (Check)

This box provides examples of questions to assist in reviewing EPE.

Is the organization's EPE:

— Providing adequate information to measure changes in the organization's environmental performance?

— Providing appropriate and useful information to management?

— Being implemented according to plan?

— Utilizing appropriate data sources and frequencies of data collection?

— Useful for analysing and evaluating collected data?

— Supported by adequate resources?

— Relevant to the organization's environmental performance objectives (KPIs) and targets?

— Providing information for reporting and communicating environmental performance?

— Considering or soliciting input from interested parties when appropriate?

— Adding value to the organization?

— Responding to change in the organization and its surroundings?

— Addressing new environmental issues?

— Well-integrated with other accepted organizational measures of performance?

As a result of the review mentioned above, actions can be taken in order to improve the EPE process. When taking action for improving the EPE process, the main focus should be on enhancing EPE as a tool for continual improvement of the overall environmental performance.

Practical Help Box 9 (Act)

Examples of actions to improve EPE:

— improve data quality, reliability and availability;

— improve analytical and evaluation capabilities;

— develop or identify new or more useful indicators for EPE;

— change the scope of EPE;

— update the training of personnel involved in specific issues related to EPE;

— improve the process for selecting indicators;

— improve EPE communication processes.

Annex A
(informative)

Supplemental guidance on EPE

A.1 General overview

This annex is intended to supplement the concepts presented in Clause 4 through examples and illustrations. Table A.1 illustrates linkages between elements of the text in Clause 4 and of this annex.

Table A.1 — Linkages between elements of the text of Clause 4 and of this annex

Main body text		Related element of this annex	
4.2	Planning EPE (Plan)	A.2	Guidance on identifying the views of interested parties in the context of EPE
4.2.2	Characteristics of EPE indicators	A.3	Supplemental guidance on selecting indicators for EPE
		A.3.1	Considerations for selecting indicators for EPE
		A.3.2	Examples of approaches for selecting indicators for EPE
		A.4	Examples of indicators for EPE
4.2.2.5	Selecting environmental condition indicators	A.4.4	Environmental condition indicators
4.2.2.3	Selecting management performance indicators	A.4.2	Management performance indicators
4.2.2.4	Selecting operational performance indicators	A.4.3	Operational performance indicators

A.2 Guidance on identifying the views of interested parties in the context of EPE

A.2.1 General

EPE planning should include establishing the means for the organization to identify and obtain information from relevant interested parties.

A.2.2 Potential interested parties

Interested parties differ widely in their relationship to the organization, their stake in the organization, their potential contributions to EPE planning, and how they express and communicate their interests.

Examples of interested parties:

— management representatives;

— employees;

— investors and potential investors;

— customers and suppliers;

— contractors;

— lending institutions and insurers;

— regulatory and legislative bodies;

— neighbouring and regional communities;

— communications media;

— business, administrative, academic and research institutions;

— environmental groups, consumer interest groups and other non-governmental organizations;

— general public;

— shareholders and providers of capital;

— employee representatives.

This list of interested parties is illustrative only. Not all of the listed parties may be relevant to all organizations. Other parties may be identified depending on the nature, location and circumstances of the organization.

A.2.3 Issues and views of interested parties

Issues related to financial interests can include:

— management and amount of environmental costs;

— financial impact related to past or present environmental liabilities;

— positive environmental initiatives;

— investments that improve environmental performance;

— commercial advantages derived from environmental issues;

— costs of compliance, or non-compliance, with environmental regulation or legislation;

  — disposal and emission treatment costs;

  — prevention and environmental management costs.

Issues related to environmental interests or to the development of public policy can include:

— health and safety;

— real and perceived risks to the environment resulting from the organization's activities, including trends over time;

— impacts on the quality of life (e.g. acoustic climate, odour, visual impact);

— environmental incidents and complaints;

— evidence that organizations are fulfilling their environmental commitments;

— environmental impacts;

— environmental loads (e.g. emissions, discharges, waste disposal) including trends over time;

— biodiversity;

— impacts on ecosystem services;

— sustainability;

— transboundary pollution and other global environmental issues;

— impacts of trade on the environment;

— harmonization of regulatory regimes;

— environmental characteristics of products and services;

— compliance with legal and regulatory environmental requirements;

— consumption of resources.

A.2.4 Methods for identifying the views of interested parties

Examples of methods to identify the views of interested parties:

— surveys and questionnaires;

— employee suggestions;

— meetings and workshops;

— citizen advisory groups and public meetings;

— interviews;

— review of public statements, internal programmes and initiatives of interested parties;

— market research;

— regulatory tracking and trending;

— voluntary guidelines and standards;

— electronic information exchange;

— participation in industry and public interest groups;

— direct communications with neighbours, regulatory bodies, customers and suppliers;

— information from the media and other sources of public information.

Organizations should consider the circumstances and characteristics of their interested parties in selecting and using methods to access their views and inputs, both directly and indirectly.

A.3 Supplemental guidance on selecting indicators for EPE

A.3.1 Considerations for selecting indicators for EPE

A.3.1.1 General

When selecting indicators for EPE, an organization should consider whether they are:

— consistent with the organization's stated environmental policy;

— appropriate to the management efforts, operational performance or the environmental conditions;

— useful for measuring performance against the organization's environmental performance objectives;

— relevant and understandable to internal and external interested parties;

— obtainable in a cost-effective and timely manner;

— adequate for their intended use based on the type, quality and quantity of the data;

— representative of the organization's environmental performance;

— measurable in units appropriate to the environmental performance;

— responsive and sensitive to changes in the organization's environmental performance;

— consistent with recognized programmes that enable comparisons;

— able to provide information on current or future trends in environmental performance.

A.3.1.2 Considerations for selecting KPIs

When selecting an EPI as a KPI an organization should consider:

— its importance to relevant interested parties (e.g. customers, regulatory authorities);

— its relevance to business objectives.

A.3.1.3 Considerations for using combined indicators

When considering using combined indicators the organization should consider:

— resource efficiency (e.g. effort spent on measuring and monitoring);

— if combined indicators can provide additional valuable information;

— the value of the component indicators that can be extracted from the combined indicator.

An indicator for EPE does not need to satisfy all of these considerations to be useful to the organization.

A.3.2 Examples of approaches for selecting indicators for EPE

A.3.2.1 Cause and effect approach

An organization may wish to develop indicators that address the fundamental or underlying cause of its significant environmental aspects. It may perform an analysis to identify such a cause and select indicators based on this analysis.

For example, an organization may determine that its high emissions of particulate matter are due to inadequate and infrequent preventive maintenance. Therefore, the organization may select an appropriate OPI, such as quantity of particulate matter emissions per day, and appropriate MPIs, such as resources allocated for preventive maintenance and frequency of preventive maintenance. It would be expected that as preventive maintenance is performed more adequately and more frequently, the organization's particulate matter emissions would decrease.

A.3.2.2 Risk-based approach

A.3.2.2.1 General

Indicators for EPE may be selected based on consideration of the risk which the organization's management determines is associated with particular activities, products or services. Examples of different risk-based approaches are given in A.3.2.2.2 to A.3.2.2.4.

An organization concerned about the risks of serious environmental damage posed by their operations may use a probabilistic risk-based approach to identify which specific process is the most likely to cause an explosion or the release of contaminants to the environment. A possible MPI is hours of process-safety training conducted for workers involved with the identified specific process.

A.3.2.2.2 Human health risk-based approach

An organization concerned about long-term health effects may identify a particular material as having the greatest risk of posing a significant health threat to workers. A possible OPI is the quantity of the

specific material to which workers are exposed from the organization's operations. A possible MPI is hours of contingency response training for handling explosions.

A.3.2.2.3 Financial risk-based approach

An organization may identify those elements related to its environmental performance with the most significant costs, and therefore, may choose to select appropriate indicators for EPE. Possible indicators for EPE are:

— cost of materials used by the organization's operations;

— quantity of this material consumed by the organization's operations;

— cost for reclamation and reuse of this material from waste;

— percentage of this material in a specified quantity of waste.

A.3.2.2.4 Environmental risk-based approach

An organization may be concerned about an environmental aspect which may threaten the environment or the competitiveness of the organization. An example of an MPI is the organization's investment allocation in replacements for chlorofluorocarbons.

A.3.2.3 Life cycle approach

An organization may select its indicators by considering the inputs and outputs associated with a particular product, and the significant environmental aspects and impacts at any stage of a product's life cycle.

EXAMPLE 1 The organization has identified that fuel efficiency of a product during use might be enhanced. Possible indicators for EPE can be the number of units of energy consumed during use of the product, and the number of changes in product design to increase fuel efficiency.

EXAMPLE 2 The organization has identified that the use of a non-renewable material in manufacturing a product is the most significant environmental aspect of that product. Possible indicators for EPE can be the amount of the non-renewable material used per unit of product, and resource allocation to study possible substitutions for the non-renewable material.

EXAMPLE 3 The organization has identified that the packaging used for transporting a product could be recovered from customers and returned to the manufacturer for reuse. A possible OPI can be the percentage of packaging materials recovered from customers and reused without further processing.

EXAMPLE 4 The organization has identified that a product does not allow for easy disassembly of parts for reuse or recycling. Therefore, possible indicators for EPE are:

— percentage of a product's parts that can be recycled or reused;

— percentage of a product's parts that cannot be recycled or reused;

— number of changes in product design to facilitate easy disassembly.

A.3.2.4 Regulatory or voluntary initiative approach

Organizations may focus their selection of indicators for EPE on those areas for which they have identified regulatory or voluntary performance requirements. In many cases, performance measures, or the data needed to develop related performance measures, have already been developed or collected by the organization. Therefore, an organization required to report the amount of routine or accidental emissions of a specific contaminant to the environment can use that measurement as an indicator for EPE.

Possible OPIs include the number of spills of a regulated contaminant per year and the amount of a regulated contaminant emitted per year.

An organization subscribing to a voluntary initiative [e.g. Responsible Care, the Sustainable Forestry Initiative[SM], the Global Reporting Initiative (GRI), the International Chamber of Commerce (ICC) Business Charter for Sustainable Development, the Coalition of Environmentally Responsible Economies (CERES) Principles] can select indicators for EPE related to such voluntary initiatives. For example, an organization, required as part of a voluntary initiative to implement a specific programme for the prevention of pollution, may wish to track the number of relevant activities undertaken by the organization over the course of a year.

A.4 Examples of indicators for EPE

A.4.1 General overview

Management may find it useful to establish logical groupings of issues or functions to assist in the selection of appropriate indicators for EPE.

Any examples of indicators for EPE provided in this subclause are for illustrative purposes only. The groupings, lists and examples given are not complete or comprehensive, and should not be construed as necessary or even appropriate for every organization. Organizations, and their policies, objectives and structures, vary greatly. Each organization should select KPIs for EPE that it recognizes as important to achieve its environmental performance objectives.

Most of the examples presented in this subclause are expressed in the form of direct measures, events or numbers simply to illustrate the kinds of factors that could be useful to monitor. An organization may find some indicators for EPE to be more useful for management's information needs and the intended use if expressed in terms of fractions or percentages, numbers per unit of time, per employee, per unit of sales, per unit of production or in other relative terms.

A.4.2 Management performance indicators

A.4.2.1 General overview

Management efforts to improve environmental performance may include implementation of policies and programmes, conformity with requirements or expectations, financial performance and community relations. Depending on the significant environmental aspects of the organization, and the organization's environmental performance objectives, it may choose some or none of the following examples of MPIs for use.

This subclause provides examples of MPIs that can be chosen to measure management efforts in an organization.

A.4.2.2 Examples of MPIs

A.4.2.2.1 Performance indicators related to management policies and programmes

If management's interest is in evaluating the implementation of environmental policies and programmes throughout the organization, possible MPIs include:

— resources to implement management policies and programmes;

— roles and responsibilities within the organization;

— monitoring and review of effectiveness of management systems or programmes;

— benefits and costs of environmental management to the organization;

— the achievement of objectives and targets;

— success of the prevention of pollution initiatives;

— percentage of employees trained versus the percentage that need training;

— percentage of contracted individuals trained versus the percentage that needs to be trained;

— number of environmental improvement suggestions submitted by employees;

— results of employee surveys on their knowledge of the organization's environmental issues.

A.4.2.2.2 Performance indicators related to regulatory compliance

If management's interest is in evaluating the effectiveness of management systems in achieving compliance with requirements or expectations, possible MPIs include:

— number and severity of compliance violations;

— number and severity of violations against the organization's requirements;

— time to respond to environmental incidents;

— percentage of identified corrective actions that have been resolved or that are unresolved;

— number of audits;

— frequency of review of operating procedures;

— frequency of emergency drills conducted;

— degree of preparedness for emergencies.

A.4.2.2.3 Financial performance correlated with environmental performance

If management's interest is in evaluating the relationship of environmental performance to financial performance, possible MPIs include:

— costs (operational and capital) that are associated with a product's or process' environmental aspects;

— return on investment for environmental improvement projects;

— savings achieved through reductions in resource usage, prevention of pollution or waste recycling;

— sales revenue attributable to a new product or a by-product designed to meet environmental performance or design objectives;

— research and development funds applied to projects with environmental significance;

— environmental liabilities that can have a material impact on the financial status of the organization.

A.4.2.2.4 Performance indicators related to community relations

If management's interest is in evaluating its programmes in local communities with respect to environmental issues, possible MPIs include:

— number of external inquiries or comments about environmentally related matters;

— number of press reports on the organization's environmental performance;

— resources applied to support of community environmental programmes;

— number of sites with environmental reports;

— number of sites with wildlife programmes;

— progress on local remediation activities (e.g. local clean up, recycling initiatives);

— approval ratings from community surveys.

NOTE Other areas of importance for management to consider are fair trade, occupational health and safety, and human rights performance. Guidance for these issues can be found in ISO 26000, the Global Reporting Initiative and ISO 45001.

A.4.3 Operational performance indicators

A.4.3.1 General overview

This subclause provides examples of OPIs that may be appropriate to measure the environmental performance of an organization's operations. An organization's operations may be logically grouped, based on inputs to and outputs from the physical facilities and equipment of the organization. The organization's operations also include the organization's physical facilities and equipment, as well as the supply to and delivery from them.

Figure A.1 shows the concept of a mass balance of inputs and outputs. In addition, it highlights the question of system boundaries.