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Activities relating to drinking water and wastewater services — Examples of the use of performance indicators using ISO 24510, ISO 24511 and ISO 24512 and related methodologies

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National foreword

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TECHNICAL REPORT

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Activities relating to drinking water and wastewater services — Examples of the use of performance indicators using ISO 24510, ISO 24511 and ISO 24512 and related methodologies

Activités relatives aux services de l'eau potable et de l'assainissement — Exemples d'utilisation d'indicateurs de performance à l'aide l'ISO 24510, l'ISO 24511 et l'ISO 24512 et des méthodologies associées

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 224, *Service activities relating to drinking water supply, wastewater and stormwater systems*.

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.

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Introduction

0.1 General

This document is a companion document to ISO 24510, ISO 24511 and ISO 24512 and was originally to be developed with the thought that many organizations (water utilities, regulators, users' associations) would benefit from examples illustrating how the performance indicator methodology and the performance indicators, such as those described and illustrated in the series of standards on the topic of activities relating to drinking water and wastewater services produced by ISO/TC 224, have been applied by a variety of organizations. Please refer to ISO 24510, ISO 24511 and ISO 24512 for guidance on the process and concepts[1],[2],[3]. However, there are many similar and parallel methodologies measuring the performance of organizations, not least of which are several "benchmarking" methodologies, some of which are described in this document. Therefore, this document provides examples of quantification practices and processes for measuring organizational performance.

Performance indicators as developed by ISO TC 224 are intended to be used primarily within water utilities, often over time, to demonstrate progress towards achieving high-level corporate objectives. In practice, these indicators are also being used to indicate projected benefits that could be achieved with changes in investment strategies or operations. Benchmarking, on the other hand, is used primarily to demonstrate the efficiency of operations, particularly by sharing information between comparable organizations often with the identification of best practices related to the particular operation being benchmarked. Used in a time series, all can also be applied to demonstrating progress towards meeting objectives and demonstrating continuous improvement. What is confusing is that both can use exactly the same metric, i.e. a numerator using one data set, and a denominator using another data set. For example, energy used/megalitre of water produced.

Figure 1 illustrates the basic similarities in the use of a typical metric for the internal uses linked to achieving corporate objectives (performance indicators) and how benchmarking (as described in ISO 24523[11]) enables information sharing on metrics and ultimately sharing of best practices. Both methodologies are intended to assist in continuous improvement and to measure achievement of objectives.

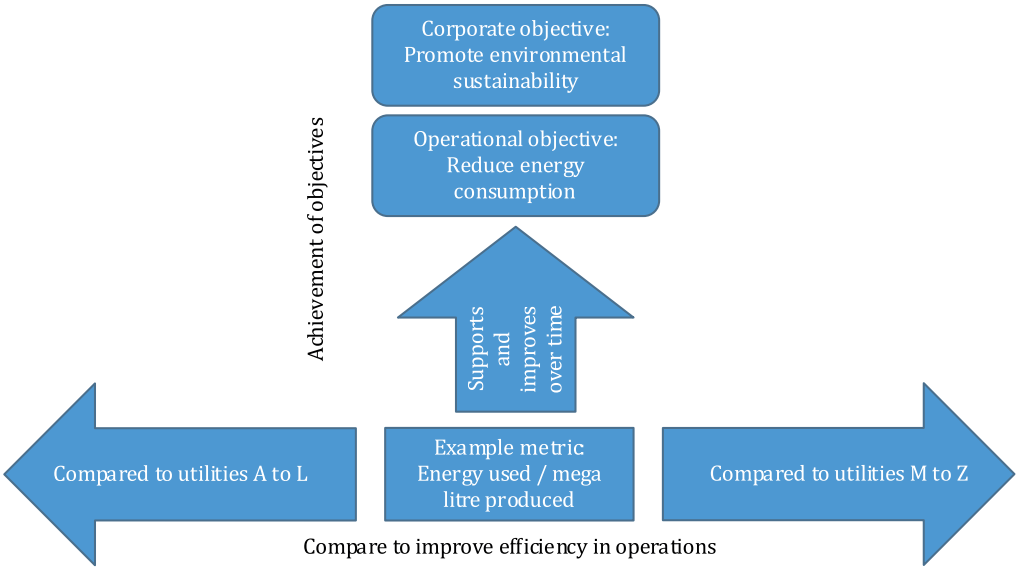

Figure 1 — Illustration of uses of performance metrics.

Within the field of organizational assessment or measurement, there are several terms that are regarded at least informally as being interchangeable. These include "performance indicators", "performance measures" and "benchmarks". The first is the preferred terminology of the series of standards on the topic of activities relating to drinking water and wastewater services produced by ISO/TC 224. The terminology describing the process for utilizing "performance indicators" and "performance measures"

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tends to be "assessment". The terminology describing the development and utilization of "benchmarks" is "benchmarking". The end result can be the same: both result in the calculation of a metric that indicates the status achieved in respect of performance of a particular function or activity. However, these terms are used to achieve subtly different purposes. Performance indicators are normally used to measure activities within a single organization where the basis of calculation does not change from year to year and, at least in the ISO standards referenced, are directly related to organizational objectives at the corporate level.

Benchmarking is intended to encourage and allow comparison between organizations providing similar services in a defined context. Such methodologies often serve to measure achievement of operational objectives (which are necessarily a subset of corporate objectives and which support the achievement of the corporate objectives). That is, the elements comprising the numerator and the elements comprising the denominator should be identical between the organizations being compared. The benchmarks will enable comparison of organizations in common and defined fields, but are not necessarily directly or closely linked to the high-level corporate objectives. ISO 24523 provides information on the benchmarking process[11].

A distinction between the performance indicator methodology and the benchmarking methodology is that while performance indicator comparison can be an essential part of benchmarking, performance assessment is a crucial part of benchmarking. Therefore, benchmarking is a way to apply the ISO 2451X standards. However, "benchmarking" differentiates from pure performance indicator comparisons through additional and continuing work steps, in particular "analysis" and "implementation" (see ISO 24523, Table 1[12]), leading to performance improvement.

The purpose of this document is to provide practical examples based on real life applications for the consideration of utilities using the guidelines in ISO 24510, ISO 24511 and ISO 24512, and also to indicate examples of where other metrics are employed for regulatory and other purposes.

This document should encourage and assist utilities, particularly small and medium-sized organizations, when using ISO 24510, ISO 24511 and ISO 24512, to think and communicate clearly about the meaning and use of performance indicators.

0.2 Summary of the methodology of the series of standards on the topic of activities relating to drinking water and wastewater services produced by ISO/TC 224

The series of standards on the topic of activities relating to drinking water and wastewater services produced by ISO/TC 224 provide guidance for water utilities that wish to demonstrate that they are meeting their broad social and other objectives as established by top management. These often reflect objectives established implicitly or explicitly in legislation which may govern the delivery of water services. The series of standards on the topic of activities relating to drinking water and wastewater services produced by ISO/TC 224 contemplate a three-step process. Step 1 is to determine water utilities' strategic objectives. Such objectives in the case of water and sanitation services explicitly include promoting public health, protecting the environment and providing for a sustainable service. Step 2 asks what service criteria are to be used to determine if the objective is being met. The final step asks what metrics should be used to demonstrate that the criteria are being achieved.

For example, Table 1 may represent these three stages in respect to the objective of promoting public health.

Table 1 — Example of the performance indicator steps employed within the series of standards on the topic of activities relating to drinking water and wastewater services produced by ISO/TC 224

Objective (Step 1 – define)	Service criteria (Step 2 – how to measure)	Indicator (Step 3 – establish a metric)
Promoting public health	Delivering safe drinking water	Percentage of delivered water quality tests that meet regulated requirements

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0.3 Purpose of the applications

In many countries, governments require that utilities (both public and private) report on their performance, in a unified and consistent manner. For example, all countries within the OECD are committed to such a policy and have established requirements for public sector utilities to publish annual reports indicating measures of their performance. The purpose of this policy and program is to provide assurances to the population that these utilities are effective in their activities (typically showing the economic efficiency of the activity in terms of cost/unit of output. For associations representing member utilities (sometimes in the public sector but often in the private sector) the association establishes methodologies for reporting on a uniform basis the performances achieved by the members. The purpose of this may often be to demonstrate good corporate citizenship and may include indicators of environmental protection, or consumer relations. For individual utilities (again for both public and private utilities), the purpose of calculating performance measures may be principally for internal purposes (e.g. reporting to management, demonstrating continuous improvement, or demonstrating the need for investment in new technology or for repair of infrastructure).

Regardless of the purpose for which the practice of measuring and reporting performance was established, benefits are obtained and shared with all stakeholders. In addition, all the metrics developed can be associated with organizational objectives and purposes.

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IMPORTANT — The examples in this report are included only because they illustrate the use of the series of standards on the topic of activities relating to drinking water and wastewater services produced by ISO/TC 224 or similar requirements or practices of assessment or benchmarking.

Value judgements expressed in these examples relate to the relative benefits for each example and reflect decisions made specifically by the management of the utilities in the examples. No endorsement is given by ISO/TC 224 to

a) those decisions,

b) the data used, or

c) their conformity with other ISO standards or non-ISO practices or requirements.

No endorsement is given by ISO/TC 224 to any organization or their practices.

No utility's particular application of the series of standards on the topic of activities relating to drinking water and wastewater services produced by ISO/TC 224 or the parallel measurement requirements or practices is recommended because the management of each utility has selected the application most suited to its needs. No endorsement is given by ISO/TC 224 of the choices made by individual utilities or the relative merits of these different applications of the series of standards on the topic of activities relating to drinking water and wastewater services produced by ISO/TC 224.

1 Scope

This document provides several examples of varying complexity which illustrate the use and intent of the performance assessment methodology set out in ISO 24510, ISO 24511 and ISO 24512. The document also provides examples of the parallel and similar practices for measuring performance or establishing benchmarks as found in various institutional circumstances. These examples represent practices in a range of utilities (e.g. small, medium and large water utilities; water utilities from developed and developing countries; water utilities in both the public and private sectors; government and non-governmental agencies; and utilities with and without certified management systems). They are drawn from many geographical locations.

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/

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3.1
benchmark
single value, representing an accepted reference value derived either from comparisons among participants or from literature, used for orientation

Note 1 to entry: The benchmark may be determined collaboratively or individually.

Note 2 to entry: By clustering, different benchmarks can occur for different peer groups.

[SOURCE: ISO 24523, 3.2]

3.2
indicator
parameter, or a value derived from parameters, which provides information about a subject matter with a significance extending beyond that directly associated with a parameter value

Note 1 to entry: Adapted from OECD works on "Core sets of indicators for environmental performance reviews"[11].

Note 2 to entry: Indicators can refer to context, conditions, means, activities or performances.

3.3
measure, noun
value resulting from measurement and the process used to obtain that value

[SOURCE: ISO 9241-11:1998, 3.11]

3.4
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, products, services, systems or organizations.

[SOURCE: ISO/IEC Directives Part 1 and Consolidated Supplement — 2017 (8th edition), Annex SL, Appendix 2, 1605 3.13]

3.5
performance measure
means used to assess the system performance, typically by diagnostic or relative performance methods

[SOURCE: ISO TR 19358:2002, 2.6, modified — term made singular.]

3.6
process
set of interrelated or interacting activities that use inputs to deliver an intended result

Note 1 to entry: Whether the "intended result" of a process is called an output, product or service depends on the context of the reference.

Note 2 to entry: Inputs to a process are generally the outputs of other processes and outputs of a process are generally the inputs to other processes.

Note 3 to entry: Two or more interrelated and interacting processes in series can also be referred to as a process.

Note 4 to entry: Processes in an organization are generally planned and carried out under controlled conditions to add value.

Note 5 to entry: A process where the conformity of the resulting output cannot be readily or economically validated is frequently referred to as a "special process".

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Note 6 to entry: In benchmarking, organizational and technical processes and combinations of both of them are considered. A process within the meaning of benchmarking comprises a combination of one task with one plant/one object (e.g. operate sewer network, treat wastewater, treat drinking water, provide domestic connection, further train staff, purchase material).

[SOURCE: ISO 9000: 2015, 3.4.1, modified — Note 6 to entry replaced.]

4 Format for the examples provided in this document

4.1 General

Examples illustrating the application of the series of standards on the topic of activities relating to drinking water and wastewater services produced by ISO/TC 224 or the parallel alternative methodologies are provided in Annexes A to D. The contents of these examples are generally organized under the headings given from 4.2 to 4.5. However, where full information on the practice or requirement is not available at the time of publication of this document, summary information and a bibliographical reference have been supplied.

Please note, the Annexes distinguish between methodologies and requirements established by international organizations (Annex A), national regulatory bodies (Annex B), associations or groups of utilities (Annex C), or individual utilities (Annex D).

4.2 Name of the organization

This section simply provides the identity of the organization offering its experience.

4.3 Background of the organization

This section briefly describes the organization and its history. The purpose is to provide a context for understanding how the performance assessment methodologies of the series of standards on the topic of activities relating to drinking water and wastewater services produced by ISO/TC 224, or similar requirements or practices of assessment or benchmarking, were applied. It is also intended to provide suitable information for a reader of this document to relate his or her own organization to the organization described in the example.

4.4 Objective for making use of performance indicators

This section includes a description of the purpose of the organization when implementing the requirement to develop and report the use of performance indicators whether conforming to the series of standards on the topic of activities relating to drinking water and wastewater services produced by ISO/TC 224 or similar requirements or practices of assessment or benchmarking.

4.5 Performance indicator methodology

This section provides a short description of each step followed in the methodology. Tables and figures may be attached to illustrate the process.

4.6 Summary of the experience

This section includes a summary of any lessons learned by the organization from the production of performance indicators whether conforming to the series of standards on the topic of activities relating to drinking water and wastewater services produced by ISO/TC 224 or other similar practices of assessment or benchmarking applied, as the case may be. It may also include the organization's conclusions on its future expanded application of the practice of assessment or benchmarking.

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Annex A
(informative)

International organizations

A.1 European Environment Agency[1)] — Purposes of performance indicators

European policies are increasingly focused on preserving the Earth's limited resources in a sustainable manner, while minimizing impacts on the environment. This is included in the resource efficiency and green economy agendas. In order to obtain knowledge on the actual pressure on the aquatic environment from water abstractions and emission of pollutants, and for assessing urban water management, we need to extend the knowledge base beyond compliance with current legislation. With the aim of improving the European level knowledge base in urban water management in the resource efficiency context, the European Environment Agency (EEA) hosted an expert meeting jointly organized with leading water associations in Europe. This event framed the context and discussed topics related to the exploitation of data already available with water utility associations and benchmarking networks beyond what is currently reported via institutional frameworks for implementing legislation.

EU-level assessments of the resource efficiency or environmental performance of water utilities are not currently as holistic as they could be. There is considerable reporting of environmental data concerning water already in place, from the local to the EU level. However, these reporting obligations are primarily concerned with the water quality parameters applicable to drinking water and treated urban wastewater. The parameters are related to compliance with the EU directives pertaining to the achievement of drinking water standards, urban wastewater collection and treatment requirements, and receiving water quality objectives.

As outlined in the EEA report 'Towards the efficient use of water resources in Europe'[5] economic production cannot be sustained if it requires excessive water use and burdens natural resources. It is thus essential that water uses and efficiencies are also considered in water management practices, including: the actual pressures in the aquatic environment from water abstractions, the resulting emissions of pollutants, and the energy consumption/recovery from managing the urban water cycle.

This report follows on from the discussions in the expert meeting on how the organizations and networks involved in urban water management can share their knowledge bases to support environmental and resource efficiency policies, and technical improvements. The availability of this knowledge base could create a more comprehensive approach to assessing Europe's water resources and threats. It could also enable a comparison of the environmental performance of different water utilities, monitor progress over time, and aid the implementation of novel environmental technologies.

In its response to the European Citizen's Initiative "Right2Water", the European Commission committed to exploring the idea of benchmarking water quality and will cooperate with existing initiatives to provide a wider set of benchmarks for water services. This significantly contributes to improving the transparency and accountability of water service providers by giving citizens access to comparable data on the key economic, technical and quality performance indicators of water operators. The information provided in this report, although having a specific focus on environmental performance based on data from voluntary benchmarking exercises, can be a useful contribution to this debate.

1) The following texts (but not the subheadings) are excerpts from the Executive Summary of the EEA Technical Report No. 5/2014[4].

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A.2 International Benchmarking Network of Water and Wastewater Utilities (IBNET) of the World Bank Group, Global Water Practice (www.ib-net.org)

A.2.1 Background of the organization

The World Bank is a development institution providing financial resources for development in more than 150 countries and territories. The World Bank Water Global Practice is in charge of development, implementation, supervision and assessment of projects related to water. The investment directly into water and sanitation utilities constitutes roughly 60 % of Water Global Practice operations and is just above one billion dollars a year for the last 10 years.

Performance and search for good utilities was always a key topic of interest of the World Bank activities in the water sector. In order to do that, the World Bank established the International Benchmarking Network of Water and Wastewater Utilities (IBNET) within the Bank's Water and Sanitation Program. Client governments develop standard indicators and maintain data to efficiently allocate financial resources and develop sector improvement programs that address water and wastewater services for all consumers, including the poor. IBNET provides a fact-based framework to measure the performance of a service provider and set the standard for water sector performance assessment. IBNET provides governments, utilities and the public with a clear and objective picture of water services and utility performance.

A.2.2 Objective for making use of performance indicators

The following are the objectives for encouraging the development, use and publication of performance indicators (benchmarks):

— Support utilities and their staff in evidence-based performance and data quality improvement;

— Help governments make informed decisions based on clear evidence in the water sector, thus improving water and sanitation services for all, including the poor;

— Maintain a leading role in setting standards for the performance assessment of municipal water utilities as well as a leading role in collecting and disseminating data on water utilities, including information on tariff structures and systems, cost-recovery and financing;

— Help generate evidence to promote good governance and improved capability, accountability and responsiveness of water and sanitation services providers through development and implementation of the performance information availability to the public they serve; and

— Develop new tools for performance assessment to include process indicators, and performance assessment for small utilities and sanitation services. By developing new performance assessment tools, IBNET will help generate more demand for benchmarking data, and will improve knowledge on the current status and development trends of the water supply of sanitation products and services.

A.2.3 Performance indicator methodology

Standard toolkit developed followed the 1996 International Water Association (IWA) Start-Up tool for utilities performance assessment. Please see details at www.ib-net.org/ and https://database.ib-net.org/DefaultNew.aspxh.

The IBNET tariff database that may also be relevant and of interest: https://tariffs.ib-net.org.

A.2.4 Summary of the experience

IBNET is **the largest publicly available database covering water utilities,** providing performance data from over 5 000 utilities in 130 countries. Over 75 percent of the utilities in the database have provided more than four years of performance information, making it increasingly possible to look into

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performance trends at the utility and sector levels[2]. It is *de-facto* used as a reporting standard in more than 40 countries.

As of now, the World Bank widely uses IBNET for its work and about 20 projects with total lending of $1,1 billion have IBNET in its performance monitoring structure.

Table A.1 — 20 bank projects using or planning to use IBNET as an official monitoring tool

Project	Project size
Albania	$18 million
Belarus	$60 million
Danube programme	$5 million
Honduras	$35 million
Macedonia	$20 million
Moldova	$20 million
Mozambique	$180 million
Nigeria	$250 million
Russia	$200 million
South Pacific	$20 million
Tajikistan	$12 million
Ukraine	$100 million
Vietnam	$150 million
Total	$1,07 billion
NOTE Spill over to other donors (Swiss DA, USAID, GIZ, KfW, AusAID and ADB).	

A.3 ISO TC 268, sustainable cities and communities

A.3.1 Scope

The scope of this TC includes standardization in the field of sustainable development in communities, including requirements, guidance and supporting techniques and tools to help all kind of communities, their related subdivisions and interested and concerned parties become more resilient and sustainable and demonstrate achievements in that regard. The proposed series of International Standards will thus encourage the development and implementation of holistic, cross-sector and area-based approaches to sustainable development in communities. As appears in the program of work, it will include management system requirement, guidance and related standards.

A.3.2 Water sectors covered

While ISO 37120[6] covers many aspects of city services, those relevant to the water services sector include:

Wastewater:

a) percentage of city population served by wastewater collection;

b) percentage of the city's wastewater that has received no treatment;

c) percentage of the city's wastewater receiving primary treatment;

d) percentage of the city's wastewater receiving secondary treatment;

e) percentage of the city's wastewater receiving tertiary treatment.

2) Funding from DFID (UK Department for International Development) in 2004 supported a strong drive for data collection through technical assistance agreements concluded with many different organizations across the world.

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Water and sanitation:

a) percentage of city population with potable water supply service;

b) percentage of city population with sustainable access to an improved water source;

c) percentage of population with access to improved sanitation;

d) total domestic water consumption per capita (litres/day);

e) total water consumption per capita (litres/day);

f) average annual hours of water service interruption per household;

g) percentage of water loss (unaccounted for water).

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Annex B
(informative)

National regulatory organizations

B.1 Angola — National Water Board, Ministry of Energy and Water of Angola

B.1.1 Background of the organization

The National Directorate for Water (hereafter referred to as NDW) is the executive service of the Ministry of Energy and Water whose aim is to study, prepare, implement and monitor the water supply, water resources and sanitation policies[3)]. The NDW has, among others, the following duties directly related to the implementation of Performance Indicator Systems:

— Prepare and coordinate the development of the water supply and sanitation national policy. Ensure its implementation and monitoring.

— Promote and coordinate the development of standards, regulations and technical specifications for the design, construction, operation and monitoring of water supply and sanitation systems.

— Propose studies whose aim is to establish tariffs to the water supply and sanitation services.

— Establish, coordinate and promote inspections, supervision and systematic monitoring of the water supply and sanitation systems operation.

— Promote the collection, management and dissemination of information concerning (...) the water supply and sanitation.

B.1.2 Objectives for making use of performance indicators

In the 2012–2017 program, the Government of Angola committed itself to achieve the following goals regarding the water supply and sanitation:

a) Ensure coverage levels up to 100 % in urban areas and 80 % in rural areas;

b) Ensure effective monitoring of water quality for human consumption, with high standards, service levels up to 70 % in urban areas and 40 % in rural areas;

c) Carry out an institutional reform in the sector, ensuring the creation of a Water Supply Management Entity in each of the Provinces.

The National Development Plan 2013–2017 (the main strategic document of the Government of Angola) aimed: *to promote, on a sustainable basis, drinking water supply to the population; water for the productive sector as well as adequate sanitation services. For this specific purpose, the National Development Plan declared as a priority: 3. Ensure efficient operation of the systems and continuing with the creation of the Management Entities, according to the institutional development of the sector.*

Based on the strategic plans of the Government of Angola, the NDW set as a goal: *establish guidelines for systematic collection and processing of information by the managing entities of water supply systems, in order to establish and oversee the minimum standards of operation of systems*.

3) Presidential Decree No. 116/14 of 30 May, establishing the Organic Law of the Ministry of Energy and Water.

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Consequently, the implementation of performance indicator systems was included in presidential decrees used to create and appoint the Boards of Directors of the Benguela, Lobito, Malange, Bié, Huambo, Cuanza Norte, Uíge and Cunene Water Supply and Sanitation Companies[4)]:

ARTICLE 28 — MANAGEMENT PRINCIPLES:

The management of EASBIE-EP (Empresa de Águas e Saneamento do Bié – Empresa Pública) should be conducted in order to match the State's economic and social policy with the technical, economic and financial viability of the company.

In guiding the management of the company, the following principles and objectives should be observed:

— Meeting targets and using indicators established by the State;

— The Company's production process should be constantly improved, ensuring the systematic improvement of the quality of services provided and its productivity.

ARTICLE 34 – ACCOUNTABILITY:

1. Annually, as at 31 December of each year, the following financial statements must be prepared:

   a. Board of Directors' Report;

   b. Analytical balance sheet and income statement.

2. The documents referred to in the preceding paragraph must be supplemented with other elements of interest in order to assess the situation of the company, in particular:

   a. Annexes to the balance sheet and the income statement;

   b. Schedules showing the extent of implementation of the business plan and budget; and

   c. Other significant indicators of company activities and status.

B.1.3 Performance indicator methodology

Under the Service Contract No. 2010/241-326 — "Technical Assistance to the National Directorate of Water Supply and Sanitation of the Ministry of Energy and Water" – funded by the European Union under the 10th European Development Fund (EDF), one of the activities of the expected Result 2 involved the development of:

1. A proposal for a Quality of Services Indicators Report, including a manual for the implementation among the public/ private organizations responsible for the water supply; and

2. A reference framework for the quality of services indicators.

Figure B.1 outlines the methodology used in the implementation of the water services performance indicators in Angola. The main steps are described in the subsequent paragraphs.

4) Benguela (EASB-EP): Presidential Decree No. 394/13. Cunene (EASC-EP): Presidential Decree No. 395/13. Bié (EASBIÉ-EP): Presidential Decree No. 403/13. Malanje (EASM-EP): Presidential Decree No. 404/13. Lobito (EASL – EP): Presidential Decree No. 405/13. Cuanza Norte (EASKN – EP): Presidential Decree No. 418/13. Huambo (EASH – EP): Presidential Decree No. 8/14.

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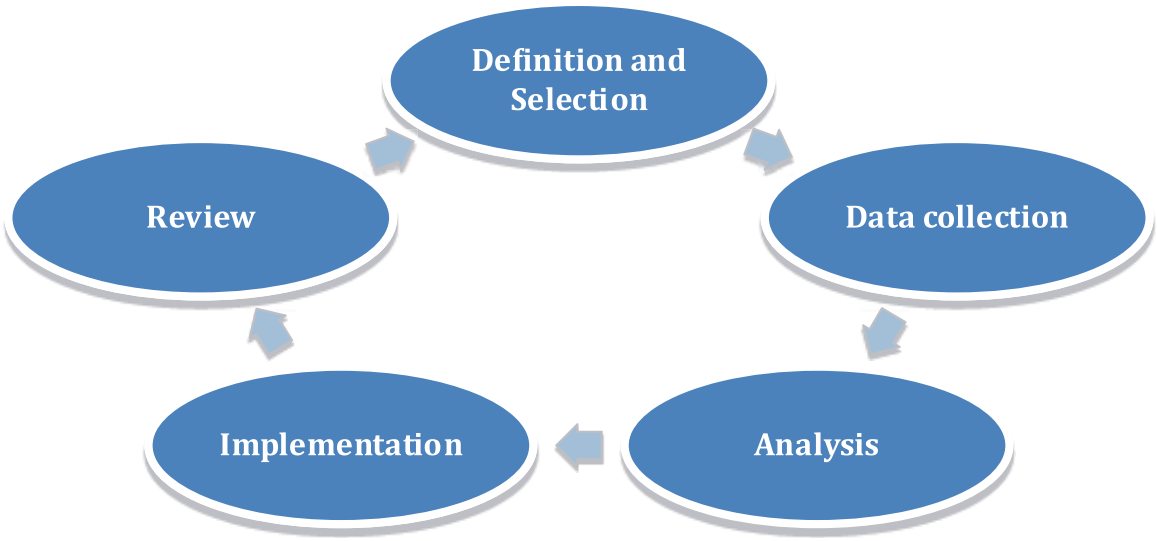

Figure B.1 — Methodological flow chart

A) **Definition and selection**

In order to have tools for evaluating the performance of the Management Entities in respect to the regulation's objectives, two groups of performance indicators were defined:

— Indicators that reflect the best interests of the users (SERVICE LEVELS): this group of indicators is intended to assess the safeguard level of the users' interests, particularly in terms of service accessibility and quality with which it's provided; this group is subdivided into the two aspects mentioned: service accessibility and quality of service to the users.

— Indicators that reflect the sustainability of the management entity (TECHNICAL): this group of indicators is intended to assess the economic and technical sustainability safeguard level of the management entity and its legitimate interests, regardless of its public, private or hybrid nature; this group is subdivided into commercial, operational and human resource aspects.

The proposed indicators' framework considers the main aspects that have been identified for the several existing management entities, as well as the aspects that were considered most relevant to the future water supply management entities that will be established. The proposed framework is shown in Figure B.2.

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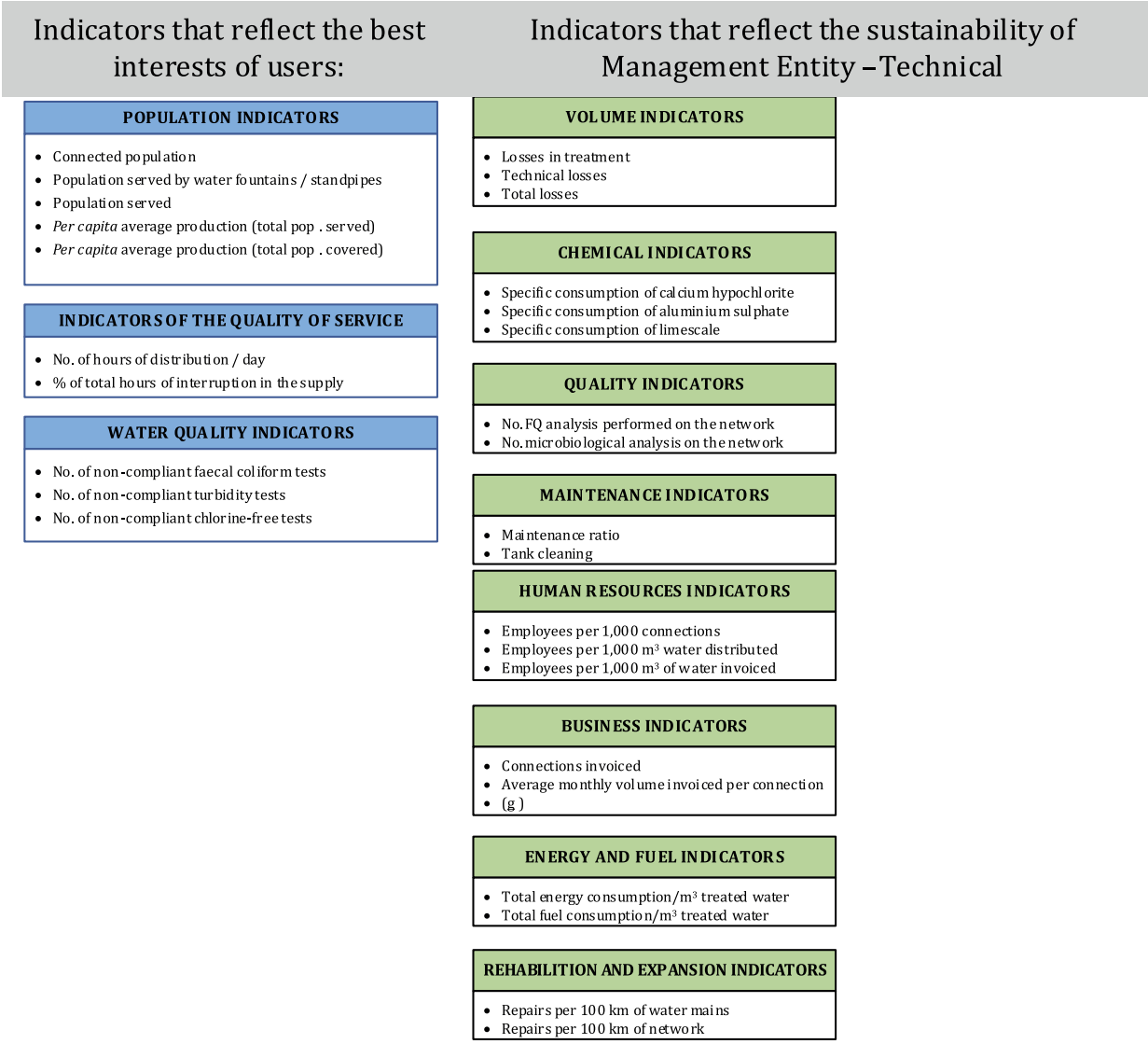

Figure B.2 — Proposed indicator framework

B) **Data collection**

The NWD proposes to carry out a monthly reporting plan (see Figure B.3) including the performance indicator report, is an effective way to compile information that will enable four objectives to be achieved.

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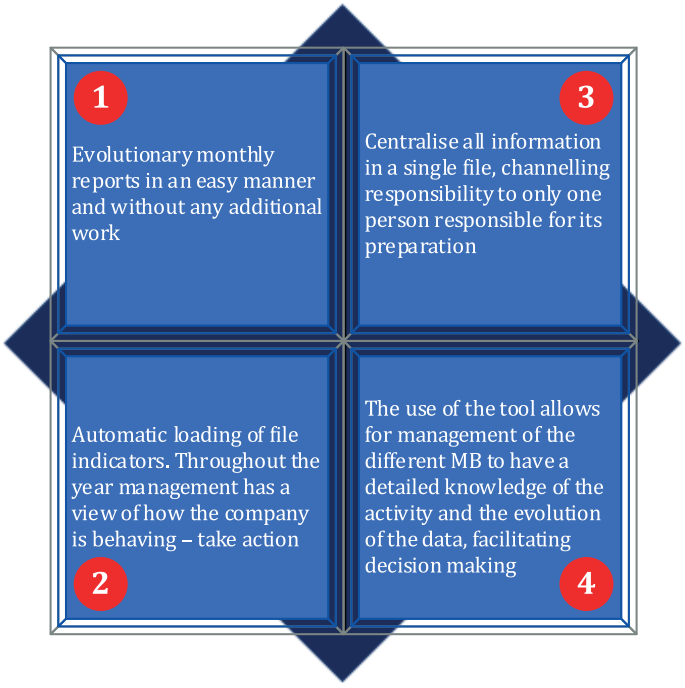

Figure B.3 — Schematic of monthly reporting plans

C) **Implementation**

The management entity needs to collect and compile a set of internal and external data regarding the operation of the company and the system. The several areas of the entity must ensure the timely delivery of data regarding its area of operation. The data should be as accurate as possible to ensure reliable information and subsequently an accurate analysis of the situation of the entity.

The data from several areas of the entity should be used to feed the monthly activity reports of the entity and its performance indicators database.

Figure B.4 illustrates the structure of the proposed information flow and the deadlines to ensure that on the 12th of each month the reports are compiled, made and delivered to the top management.

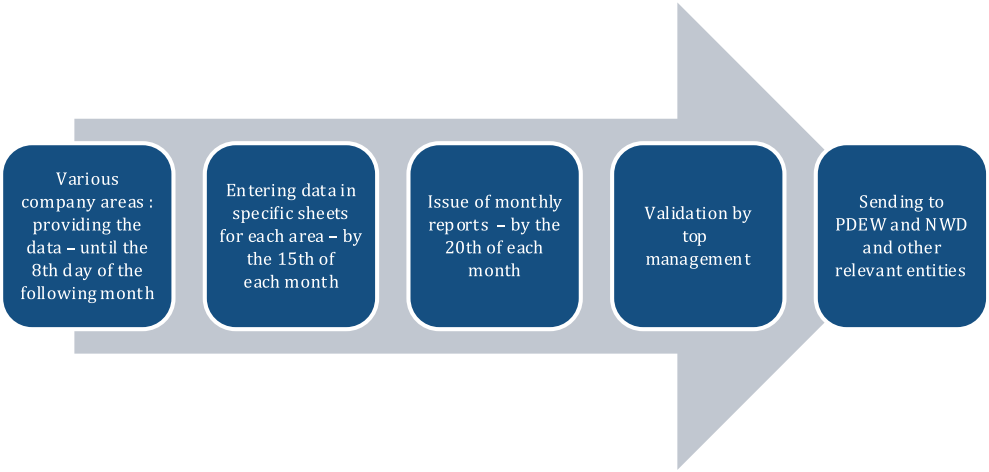

Figure B.4 — Proposed information flow

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B.1.4 Summary of the experience

Regarding the implementation of the indicators system, the only province that is currently implementing and using the developed tools is the Lunda Sul. According to the Provincial Director of Energy and Water the Indicator System developed has the following difficulties and challenges:

Difficulties encountered:	How were they supported:
— The main difficulties were related to the length of the report, the different data to be inputted and in principle, for its supposed complexity. — Obtaining the desired data was also one of the greatest difficulties, given the dispersion of the data sources. — The fact that data collection, classification and data entry from all areas was done by only one person. — The time taken for entering the data was far too long.	— After experiencing the initial difficulties inherent to the new system, it was decided to create small tables from the main table and distribute them to all areas. — The creation of small work teams; at the end of the month where each team presents the results to the person responsible for entering the data.

Figure B.5 illustrates that, regardless of the difficulties and challenges, the DPEA of Lunda Sul identified the advantages of using the proposed system.

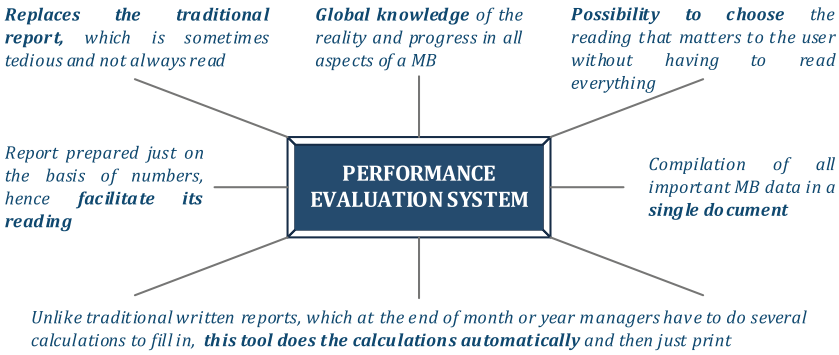

Figure B.5 — Advantages of the proposed system

B.2 CANADA — Ontario Municipal Affairs and Housing, Government of Ontario

B.2.1 General

The information for this example was drawn from the following URL:

http://www.mah.gov.on.ca/Page297.aspx Ministry of Municipal Affairs and Housing, Municipal Performance Measurement Program (MPMP).

B.2.2 Background of the organization

The Ministry of Municipal Affairs and Housing is a Ministry (Department) of the Government of Ontario, Canada and administers 47 statutes including particularly:

Ministry of Municipal Affairs and Housing Act: https://www.ontario.ca/laws/statute/90m30

Establishes the Ministry and outlines the Minister's powers. Gives the Minister general responsibility for Ontario's housing policy and programs and responsibility for the Acts the Ministry administers.

Municipal Act, 2001: https://www.ontario.ca/laws/statute/01m25

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