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Sustainable cities and communities — Transforming our cities — Guidance for practical local implementation of ISO 37101

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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).

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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 268, *Sustainable cities and communities*.

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

The unprecedented growth in urban population across the globe presents massive challenges to governments and their citizens. At the same time, this trend offers an opportunity to find new ways of managing cities and the overall impact of human settlements on the environment, respecting planetary boundaries¹⁾, addressing in particular climate change and loss of biodiversity. Accordingly, many communities, both large and small, are therefore committed to sustainable development.

On 25 September 2015, many countries through the United Nations committed to adopting 17 sustainable development goals (SDGs) addressing a broad range of development issues, including ending poverty, protecting the planet and ensuring sustainable levels of prosperity for all²⁾. Each goal has specific targets to be achieved by 2030. However, UN SDG 11b specifies that by 2020 cities should embark on integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, and resilience to disaster. Achieving these goals requires coordinated work by governments, the private sector, civil society and citizens. Cities, in particular, are key sites of, and actors in, sustainable development. Local governments play a key organizing role in building more sustainable and desirable collective futures. ISO 37101 refers to the SDGs: “When evaluating the contribution to achieve the six purposes of sustainability, taking into account the twelve sustainability areas of action, the organization shall *consider the UN SDGs* (in particular Goal 11), as well as their **potential implementation** in communities”.

ISO 37101 is a management system standard for communities that commit to the sustainable development of their administrative area or territory. **This document applies ISO 37101 to specific types of communities: cities, towns, villages or other kinds of human settlements** with territorial boundaries and administrative authority. Building on and operationalizing the general requirements set out in ISO 37101, this document offers practical guidance to all types of cities and other settlements on initiating, planning, implementing, measuring and managing sustainable development activities in a way that is holistic, inclusive and based on sustainability principles. Successful sustainable development should deliver well integrated environmental and societal outcomes (social cohesion, economic stability and people’s quality of life), and other long-lasting benefits.

The purpose of this document is to guide organizing bodies, usually local governments, in their efforts to stimulate and coordinate sustainable development. This document is primarily designed to assist with city-wide strategies. Other ISO standards might apply or other guidance might be developed for schemes on a broader or smaller scale. This document helps cities to raise questions without necessarily providing standardized answers. It provides a common framework that facilitates exchange and communication.

This document recommends the different steps that local governments should take to ensure that, in their city or community, their actions contribute to the achievement of the six purposes of sustainable development set out in ISO 37101. It applies the ISO 37101 Plan-Do-Check-Act systems approach (PDCA) to local governments. PDCA is a management methodology of five steps, based on political commitment, used to ensure the continuous improvement of a wide range of complex processes. This document also gives guidance for establishing, implementing, maintaining and continually improving such a management system to enable local governments to follow a systematic approach to sustainable development.

ISO 37101 and this document coalesce around *six main purposes* that typically express and underpin the values of communities that wish to develop sustainably: overall attractiveness, the preservation and improvement of the environment, resilience, responsible resource use, social cohesion and the well-being of citizens. These purposes are explored across *12 closely relevant sustainable development areas of action*.

1) See ISO 37101:2016, Introduction.

2) See UN Report 'Transforming our world: the 2030 agenda for sustainable development', <https://sustainabledevelopment.un.org/post2015/transformingourworld/publication>. Use of the word 'transforming' in the title of the current document represents a direct connection to this UN report, seeking to highlight the role of cities in securing the broad transformation required by the SDGs.

In addition to recommendations for the use of a management system approach, this document provides local governments with a methodological framework based on cross-tabulation of the purposes and areas of action that allows users to explore systematically whether existing and new strategies, programs, plans or services inter-connect and make a positive contribution to the sustainable development of cities and other settlements.

Following the introductory clauses outlining the scope of this document ([Clause 1](#)), relevant normative references ([Clause 2](#)) and a set of terms and definitions drawn principally from ISO 37101 ([Clause 3](#)), this document identifies three main components for successful implementation of a management system for sustainable development, as described in [Figure 1](#):

- 1) In [Clause 4](#), a **political commitment** that supposes:
 - local government leadership of a scheme and the expression of a vision for its implementation;
 - one organization in charge of the management of the scheme;
 - involvement of all relevant interested parties;
 - awareness, capacity building and reinforcement of staff competencies.
- 2) In [Clause 5](#), a **management system of the scheme** that mobilizes all relevant fields for the sustainable development of cities, cross-analysing the 12 areas of action and six purposes, with four main stages:
 - baseline review;
 - establishing the strategy, which includes identifying and prioritizing the objectives according to the policy, that provides the global vision, conformity obligations, resources and their contribution to the six purposes;
 - establishing the action plan;
 - conducting evaluation of performance and continual improvement.
- 3) In [Clause 6](#), robust **support for the management system** that ensures:
 - mobilization of adequate resources;
 - a communication plan at each stage of the process;
 - a record of the documented information.

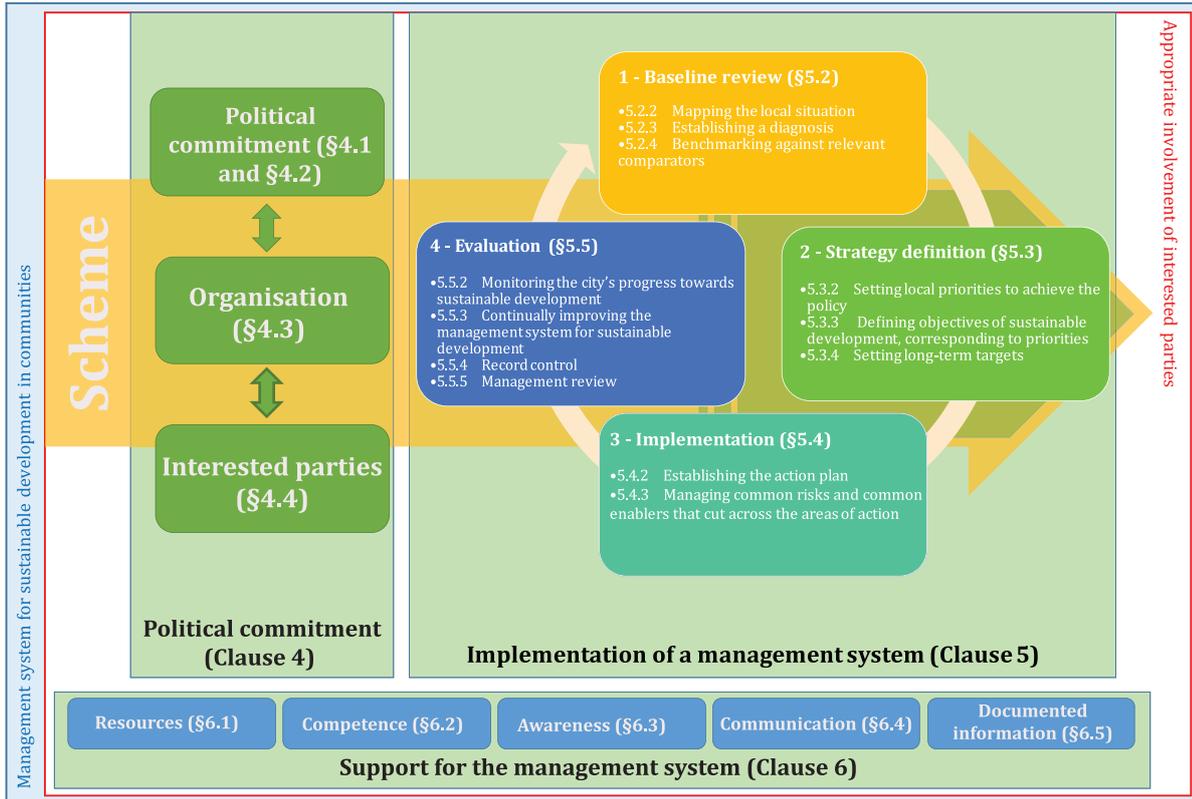


Figure 1 — Key steps of the management system

The “cross-analysis” of purposes and areas of action is a useful tool to support integrated implementation of the UN SDGs, especially Goal 11, as [Annex A](#) explains.

[Annex B](#) provides examples from cities which have implemented management practices in line with ISO 37101.

[Annex C](#) provides a national example of use of the cross-analysis matrix.

ISO 371xx family

ISO 37101 and this document are part of the ISO 371xx family which aims to foster the exchange of experiences at national and international levels. The family is an open framework, allowing the inclusion of a wide range of supporting documentation, examples and references from many sources. This library will be added to, updated and revised over time. Note that neither this document nor any subsequent standards in the series are intended to introduce new requirements for certification beyond those contained in the over-arching ISO 37101 framework. Rather, this document provides a degree of practical substance and reference material that complements other ISO 371xx standards.

Sustainable cities and communities — Transforming our cities — Guidance for practical local implementation of ISO 37101

1 Scope

This document provides guidance on how to implement and maintain a management system for sustainable development based on ISO 37101 principles, specifically in the context of cities, but applicable to other forms of settlement. This document:

- provides guidance for practical implementation of a management system for sustainable development in cities and other settlements, based on ISO 37101;
- establishes a methodological framework for the systematic evaluation of the sustainable development schemes and achievements in the city or other settlements, based on the cross-analysis of the six purposes of sustainability and the 12 areas of action of ISO 37101;
- illustrates how other International Standards can be used to support successful implementation of ISO 37101, including, in particular, ISO 37120 (which recommends a suite of city indicators mapped against the six purposes of ISO 37101) and ISO 37106 (which provides practical guidance on how to implement joined-up delivery and innovation across organizational boundaries within the city or settlement).

This document is intended for organizing bodies, decision-makers, executive officers and managers in cities – usually, in the first instance, the relevant local governments.

This document is intended to help cities become more sustainable, through the implementation at city level of strategies, programmes, projects, plans and services referred to in this document as schemes (see Note 1 and [3.7](#)). It also provides a platform to help demonstrate and communicate their commitment, progress and achievements.

NOTE 1 In this document, the term “scheme” is used to cover strategies, programs, projects, plans and services.

NOTE 2 The guidance can be used for city-wide strategies, but also, potentially, for some sector-specific schemes at a city level.

This document is applicable to a range of types and scales of communities: cities, towns, villages or other kinds of human settlements with defined boundaries.

NOTE 3 In this document, the term “city” refers to cities, towns, villages or other kind of human settlements with defined territorial boundaries and administrative authority.

The approach is in line with other deliverables developed by ISO/TC 268 and ISO/TC 268/SC 1 that could be identified as the ISO 371XX family.

This document can be used in whole or in part to establish or systematically improve a community-based sustainable development management system. It provides additional operational instructions and examples regarding ways of meeting the 37101 requirements.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 37101, *Sustainable development in communities — Management system for sustainable development — Requirements with guidance for use*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 37101 and the following apply. Some definitions drawn from ISO 37101 might be restated for clarity, as necessary.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia available at <http://www.electropedia.org/>

3.1

purpose of sustainability

long-term sustainability goals that a *city* (3.6) seeks to achieve by using different methods and levers (i.e. the areas of action)

Note 1 to entry: In this document, “purpose” refers to purpose of sustainability.

Note 2 to entry: The six purposes allow cities to evaluate the impacts of different types of actions systematically.

Textbox: Focus on the six purposes of ISO 37101**Attractiveness**

Including: potential for economic development; general appeal to citizens and investors; richness of culture, encouragement of creativity and innovation; established connectivity and the continual development of alternative forms of mobility (such as quality of sustainable public transport infrastructures).

Preservation and improvement of environment

Including: climate change mitigation (such as by reducing greenhouse gas emissions; preservation, restoration and enhancement of biological diversity and ecosystem services); protection of ecosystems, (including plant and animal diversity and migration as well as genetic diversity); reducing pollution (including improving air quality and reducing health hazard).

Resilience

Including: preparation for climate change adaptation; *climate* risk reduction actions and crisis management plans, *vulnerability assessment*, development of social capital and capability, demographic evolution; financial and economic shocks and stresses testing and organisational preparedness.

Responsible resource use

Including: improved land use management; reducing, reusing and recycling of materials; respect for scarcity of all types of resources (notably water and energy). *Promoting the environmentally safe reuse and recycling/treatment of e-waste and batteries. Encouraging preparation for reuse of products, and imposing conditions for the safe recycling, recovery and disposal of waste materials.*

Social cohesion

Including: Equitable accessibility to services; dialogue with external parties not limited by city boundaries, enhancing and celebrating diversity; heritage and building a sense of identity; inclusiveness; mutuality, and shared experiences; rootedness; sense of belonging and increasing opportunities for social mobility, cohesion and the reduction of inequalities. *Social cohesion is a relevant element of Agenda 2030 which focuses on reaching the SDGs. It is summed up by the phrase "Leave no one behind"*<?>.

Well-being

Including: access to quality-of-life opportunities; all-life education and job-related training, human capital improvement; healthy environment and liveable city; security; building self-confidence and collective maturity. NOTE Three entries have been updated with the text in italics to reflect the latest international agreements and the current discussion on sustainable development efforts in cities and communities.

3.2**sustainability issue**

area of action related to city services that:

- may have strategic, operational and competitive implications;
- helps organizing bodies such as local governments to achieve the purposes (3.1)

Note 1 to entry: throughout this document, "area of action" refers to ISO 37101:2016, 4.6.

Textbox: The 12 areas of action addressed in ISO 37101

Governance, empowerment and engagement

Including: actions aimed at involving the different local actors and encouraging them to work together on collaborative projects. Such actors might include public actors, private actors, universities and research, associations, charities and citizens.

Education and capacity building

Including: actions aimed at raising awareness, providing information, communication, education and training for different audiences and levels.

Innovation, creativity and research

Including: actions involving innovation, creativity and research. For example, the establishment of innovation clusters, places of physical and virtual exchanges, the definition of public policies to support the realization of innovative demonstrators in the territory.

NOTE Innovation can take many forms, including social, technological, organizational, economic and financial innovations.

Health and care in the community

Including: actions aimed at improving health and care in the community, with a particular emphasis on projects targeting the most vulnerable and fragile sections of the population (e.g. children, the elderly, people with disabilities, and people who are insecure, mentally ill or distressed) and also projects targeting areas that lack access to care and health facilities.

Culture and community identity

Including: actions aimed at supporting and promoting culture in its diversity, notably minority and marginalised cultures. It also concerns actions aimed at fostering meeting opportunities and exchanges between different cultures both inside and outside the territory.

Living together, interdependence and mutuality

Including: actions and mechanisms aimed at promoting equal treatment of all citizens. It also concerns actions that encourage living together, constructive challenge and policies reducing inequality in all its forms.

Economy and sustainable production and consumption

Including: actions aimed at promoting and fostering the development of sustainable production and consumption, for example by establishing rules governing public procurement.

Living and working environment

Including: actions in the field of construction or renovation of buildings and public spaces. Actions aimed at encouraging good appropriation of buildings and public space by different users (e.g. adaptability, flexibility and innovation).

Safety and security

Including: actions aimed at preventing and managing all types of risks, actions aimed at reducing the causes of delinquency and crime; actions to ensure general safety and security.

Biodiversity and ecosystem services

Including: actions aimed at protecting, integrating and promoting natural environments in the city and its surroundings, for example green spaces, landscapes, wetlands and aquatic environments, ecological corridors, fauna and flora. Actions aimed at better understanding and using the positive impact of diverse ecosystems.

Community smart infrastructures

Including: actions aimed at ensuring high-quality utilities, for example urban water supply services and wastewater treatment; collection and treatment of waste; production, transmission and distribution of energy (e.g. electricity, heat, cold); integration of internet and other communication services.

Mobility

Including: actions aimed at promoting the development of public transport, and of active and alternative transportation modes (e.g. electric cars, carpools). It includes actions aimed at fostering the integration of information technology in the management of mobility, the regulation of goods and people transportation (e.g. reduction of speed) and parking policy.

3.3**cross-analysis matrix**

methodological tool for conducting a cross-analysis based on the six purposes of sustainability and the 12 areas of actions

Note 1 to entry: See [5.2.3](#) for a detailed description of how to use the cross-analysis matrix as a simple tool to perform the diagnosis. [Figure 2](#) illustrates the concept of a cross-analysis matrix.

3.4**city council**

main organizing and decision-making body of the local government, especially the political lead

3.5**local government**

part of government in a country or nation that is typically closest to the population, is in charge of managing, governing and promoting development of a local area, and is responsible for the definition, design, development and institutionalization of its public policies expressed in the provision of services to its citizens

Note 1 to entry: The basis for a local government can be, for example, a territorial division and the political and administrative organizations that are closest to the population. It is typically a public entity formed by territory, population, government and legislation. It normally has specific legal capacity and scope to determine its own political, administrative, cultural and historical heritage and regulatory capability.

Note 2 to entry: At the city level, the political lead is with the city council. The local government is responsible for the management system and for involving the different stakeholders.

[SOURCE: ISO 18091:2014, 3.5, modified — Note 2 to entry added.]

3.6**city**

urban community falling under a specific administrative boundary

Note 1 to entry: In this document, the term city is taken to refer to cities, towns, villages or other kind of human settlements with defined boundaries.

[SOURCE: ISO 37101:2016, 3.3, modified — Notes to entry revised.]

**3.7
scheme**

strategy, program, project, plan or service to which this document is applicable

Note 1 to entry: The scope of the management system is a city-wide scheme such as a sustainable development plan, climate strategy, energy strategy, mobility plan or green area development plan. Some examples are provided in case studies in [Annex B](#).

**3.8
policy**

intentions and direction of an organization, as formally expressed by its elected or accountable top management

**3.9
strategy for sustainable development**

strategic framework which supports a city's overall policy for sustainable development

**3.10
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 and process).

Note 3 to entry: An objective can be expressed in other ways, for example as an intended outcome, a purpose, an operational criterion, as an objective of sustainable development in communities, or by the use of other words with similar meaning (e.g. aim, ambition or goal).

Note 4 to entry: In the context of management systems for sustainable development in communities, objectives for sustainable development in communities are set by the organization, consistent with the policy for sustainable development in communities, to achieve specific results.

[SOURCE: ISO 37101:2016 3.26, modified — Notes to entry revised.]

**3.11
interested party**

stakeholder

person or [organization](#) that can affect, be affected by, or perceive itself to be affected by a decision or activity

Note 1 to entry: The term refers to the persons or organizations that are *effectively* affected or perceive themselves to be affected by a decision or activity. Stakeholders are the persons or organizations that *effectively participate* and engage themselves in processes of elaboration, implementation or evaluation.

[SOURCE: ISO 37100:2016, 3.2.5, modified — Note 1 to entry added.]

4 Political commitment: leadership, responsibilities, organization and capacity building

4.1 Local leadership in context

The context for the sustainable development of the city is set not only by municipalities, but by national and regional administrations in accordance with international agreements, national regulations, and regional, economic and budgetary policies. The relations between these different levels of government and administration need to be considered when addressing sustainable development of territories and cities. Cross-boundary issues and collaboration with neighbouring localities also need to be tackled.

Local governments have a key role in committing to and enacting local sustainable development. They usually decide on financial and budgetary matters, personnel changes, institutional reform and spatial and environmental planning, as well as natural resource substitution or management to deliver such a policy. They give a credible mandate for and initiate local implementation partnerships and ensure both initial stakeholder buy-in and their long-lasting engagement. They also evaluate achievements in relation to local or regional political commitments to sustainable development and, where necessary, may reconsider their sustainability pathway.

A council committed to sustainable development, and seeking to implement its commitments effectively, is advised to establish an integrated management system according to ISO 37101. In cities, formal political approval is required to officially launch a management system for sustainable development. The city council mandates its administrative body to organize and coordinate the management system for sustainable development, allocating appropriate resources, including staff and finances. Once a fundamental decision is reached and capacities and procedures for local sustainable development and resilience management have been established, formal decision-making is sought at frequent intervals during each agreed management period of this process.

Textbox: Role of politicians in sustainability management

- development of a vision, referred to in this document as the policy
- legitimization and mandate
- resourcing of measures
- evaluation and accountability
- leadership in influencing public opinion and private companies in the role of chair or a member of business boards
- representation of a city to others externally

4.2 Political decision-making

A key factor in the successful elaboration and implementation of the management of sustainable development is the quality of political leadership. In order to assume a leadership role, the political decision-making body may demonstrate its commitment through the establishment of a common and public policy for sustainable development in the city. This policy is a brief and important document that specifies the expected outcomes and the values on which it is based; the relevant technical and geographical scope of the management system for sustainable development; and the commitment to allocate appropriate resources to elaborate, implement and continually improve it. The policy should normally establish innovative procedures and incentives to encourage sustainable endeavours. It should also ensure that measures towards sustainability are enacted broadly and regularly, which should involve and empower interested and affected parties.

4.3 Organization and capacity building

4.3.1 Organization, roles and responsibilities

Development of a shared and compelling policy for a more sustainable future requires significant leadership, sustained in the long term and embedded within effective governance processes. Experience suggests the following factors are of importance in structuring the leadership of a management system for sustainable development:

- a) a clear focus on accountability and lines of responsibility within the city authority;
- b) a broad-based leadership team across the city;
- c) bringing key decision-makers together in effective governance arrangements;

- d) deployment of formal programme management approach;
- e) ensuring the right skills mix in the leadership team;
- f) securing external expertise when necessary;
- g) allowing for organizations' evolution over time;
- h) ensuring an open and transparent governance process;
- i) establishing a proper auditing and evaluation mechanism;
- j) mechanisms for working with other levels of government and within the region.

4.3.2 Capacity building within the management system's staff

The level of competence of the management system's staff should be improved continually and consciously, in particular through training courses as a complement to their job-related education and experience. Along with training courses for job-related topics, employees should regularly receive information about sustainability management and its progress in the organization.

The head of an office or department should coordinate the important work of mapping the educational needs among the management system's staff. In this way, course topics requested by employees can be integrated into the training plan, and the coordination team can keep track of a wide range of education offerings.

From beginning to end, successful sustainability management requires the participation of staff from all levels. Continuity can be ensured from the outset by establishing a continually maintained intranet that connects all departments.

Textbox: Focus on local government's key responsibilities

- acknowledge the importance of continual and consistent information flow and further education on sustainability and resilience areas of action;
- evaluate training courses, considering their cost-benefit value, method of delivery and impact;
- provide training courses for all relevant employees whose activities have an impact on sustainability and resilience;
- raise awareness at all levels;
- recognize the significance of conforming to sustainability policy and management system;
- recognize the significance of the real and potential impact of their activities on sustainability;
- recognize the significance of their duties;
- evaluate and define responsibilities for successfully implementing the sustainability policy, the procedure and stipulations of the management system, and the significance of the consequences of deviating from given procedures;
- ensure effective and comprehensive documentation of all interventions;
- integrate sustainability concepts and principles in all departments, not only in the environmental sector.

4.4 Involving interested parties

4.4.1 The importance of engagement and partnership

Dialogue and collaboration with interested parties constitute strategic necessities for implementing sustainable development in cities. Stakeholders have a key role both in identifying the major sustainability areas of action and in formulating and implementing relevant solutions. Establishing a process of sustainable change requires a critical mass of actors to be both engaged and supportive. Local governments should, as a priority, collaborate with all interested parties using a range of approaches appropriate to the local context. The involvement of interested parties should cover awareness and participation, cross-sectoral partnership and engagement with other cities where appropriate.

Textbox: effective engagement and collaboration interested parties requires, as a minimum

- mapping of relevant interested parties;
- understanding their needs and expectations;
- identifying their potential roles and resources;
- establishing mechanisms for effective dialogue and participation;
- sharing diagnosis and jointly securing continual improvement.

NOTE ISO 37106 distils current good practices to support city leaders developing and delivering their own smart city strategies. ISO 37106:2018, 6.6 emphasizes the key role of involvement and effective collaboration across a wide range of interested parties for the success of the implementation of the strategy.

4.4.2 Communicating effectively with interested parties

To create a useful and informative communication channel and develop a work plan, several general communication principles need to be taken into account.

Textbox: general communication principles

- Shape the message to fit the audience: the fundamental starting point for communication is identifying who the stakeholders are and adapting the information to meet their needs. One well-known formula is “keep it short and simple”.
- Choose an accessible format: a variety of formats can be used (e.g. brochures, physical and e-newsletters, social media, posters, online reports, printed reports). Suitability will depend on the target group, the message to be delivered, budget, and geographical and technological viability.
- Be creative: positive engagement with stakeholders requires commitment, effort, attention to detail and creativity. It is important not to underestimate the personal skills and capacities of stakeholders. Instead, try to define unusual and engaging settings for participatory processes, and complement this with creative, honest and engaging communication.

4.4.3 Involvement and communication throughout the process of managing sustainable development

The importance of a strong and long-lasting partnership process to long-term success cannot be underestimated. A significant part of improving the sustainability performance of the urban area will involve medium and long-term collaboration with a variety of stakeholders who may themselves evolve over the course of implementation. An integrated management approach should ensure that, while efforts are focused on the most important and urgent problems, and while these initiatives are

coordinated and as efficient as possible, long-term strategic goals are supported and not undermined by immediate project requirements.

Textbox: key stakeholders

The management system should provide for effective involvement of all relevant actors, as a minimum:

- politicians (including opposition politicians) to guarantee legitimization, cross-party inclusivity and durable support for target achievement;
- citizens, who have a stake in issues affecting the urban area as their place of residence, work and life in general;
- technical experts, who can provide both initial and on-going assessment of the contextual and practical conditions of the scheme and its development;
- a range of different officers (from different sectors) in refining both assessments and implementation of schemes, based on research and past assessments of comparable programs;
- other public- and private-sector organizations that may affect or be affected by the delivery of the scheme or otherwise have an interest in its location or outcomes.

Interested parties in cities are numerous and may have very different expectations and demands as to strategic direction. They may also have very different capacities to contribute to sustainable development and to the management process. Mapping of interested parties typically involves identifying their various types (e.g. associations, corporations, charities, public services, individuals), their capacity for action, and their aims and level of commitment, especially to the strategy and purposes.

As integrated sustainability management aims to organize and improve the decision-making and implementation capacity and activities of local governments, involvement of interested parties should be undertaken at all stages of work, as described in the following textbox.

Textbox: engaging interested parties in the relevant steps of sustainability management**Baseline review**

In the baseline review, relevant impacts on and of the interested parties must be taken into account. This means the impacts within the city's area of responsibility, as well as impacts on the city development and neighbouring municipalities caused by other actors. Much of the baseline review is developed internally within the local urban administration, as intimate and expert knowledge of relevant administrative departments and regulations is needed. However, involvement does not stop with the municipal staff or at the city's borders. Other interest groups need to be taken into account. As such, they should be enabled to provide information, gather data or comment on the findings of the baseline review.

Establishment of the vision, strategy and action plan

Developing a common vision and clearly identifying priorities is fundamental. Setting of goals and time-related targets is important to create commitment and ownership of the scheme and implementation actions. Therefore, an inclusive, participatory approach should be applied when developing the vision, agreeing on priorities, and contributing to the local government's ambitions and related targets.

Implementation and monitoring

The implementation phase is particularly demanding in terms of organization and coordination, as well as in terms of maintaining coherency between strategy (and sustainability goals) and implementation. While the generic action plan serves as the operational foundation for implementation, it also needs refinement to ensure coherence and adaptability. In addition, due to the usually crosscutting nature of sustainability, an integrated approach is needed across the 12 areas of action. A number of different actors (e.g. cross-departmentally, private sector; civil society actors) must be involved and will be responsible for carrying out specific actions, and should also be integrated into monitoring considerations as well as monitoring processes.

Evaluation and reporting

Just as diverse stakeholders were part of the design, implementation and communication process, they will also have a stake in the evaluation and reporting process. A good evaluation process engages all stakeholders and thus comes full-circle, benefiting from and engaging with the original assessment of the needs, aims and roles of stakeholders. It is also useful to those ultimately responsible for improving the integrated management system. This evaluation provides the city council with a basis for taking further decisions on the objectives and actions for the next cycle. It provides the stakeholders, including citizens, with a review of what the city has done during the year and how they have succeeded in fulfilling their objectives. Hence, the report will also be an important public awareness and educational tool.

Continual improvement and enhancement

It is very important to evaluate existing and on-going city sustainable development implementation achievements periodically. This can be done using a range of suitable and tailored indicators, and through surveys, with reference to the earlier baseline review and consultation work. Decision-makers, organizations, third parties and the public should participate in the following progress of enhancing the integrated processes of the scheme:

- the decision-making body or entity draws up a strategic plan of enhancement;
- the local government oversees the execution of the plan and is responsible for the coordination effect of enhancement;
- a third party or parties may inspect and evaluate the implementation results of enhancement to allow independence;
- citizens participate through investigations and satisfaction surveys to generate and utilize feedback from the results of enhancement.

5 Implementing a management system for sustainable development**5.1 Introducing the five-step process**

This clause is at the core of this document and provides a consistent methodological framework that guides the local government in designing and implementing a scheme that contributes to the sustainable development of a city. This methodological approach is at the core of the management system for sustainable development described in ISO 37101. [Figure 2](#) illustrates how the following five steps form a coherent methodological process in this task.

This clause will detail the five key steps of the methodological process:

- a) **Political commitment:** local governments have a key role in committing to and enacting local sustainable development. They usually decide on financial and budgetary considerations, personnel changes, institutional reform, territorial and environmental planning as well as natural resource substitution or management to actualise such a policy.

NOTE See ISO 37101:2016, Clause 5.

- b) The **baseline review** ([5.2](#)) is an initial diagnosis mapping the local situation, with regard to the six purposes of sustainability.

NOTE See ISO 37101:2016, 6.1.2.

- c) The **strategy definition** ([5.3](#)): based on the result of the baseline review, objectives of sustainable development of the scheme are identified. At this stage, the strategy consists of prioritizing these objectives of sustainable development regarding the policy, compliance obligation, resources and

their contribution to the six purposes in a long-term (20–30 years) and mid-term (5–10 years) vision, with associated targets.

NOTE See ISO 37101:2016, 6.2.

- d) The **establishment of the action plan** (5.4) which defines the actions, responsibilities and tasks to be undertaken in order to implement the scheme. This is an important step that defines the short-term targets (1–3 years) and provides the condition for a successful implementation;

NOTE See ISO 37101:2016, Clause 8.

- e) The **monitoring, reporting and verification of progress** (5.5) towards sustainable development against the six purposes (ISO 37101) is about checking the implementation of the action plan and measuring the impacts of the actions in terms of performance, against the objectives and related targets set in the scheme.

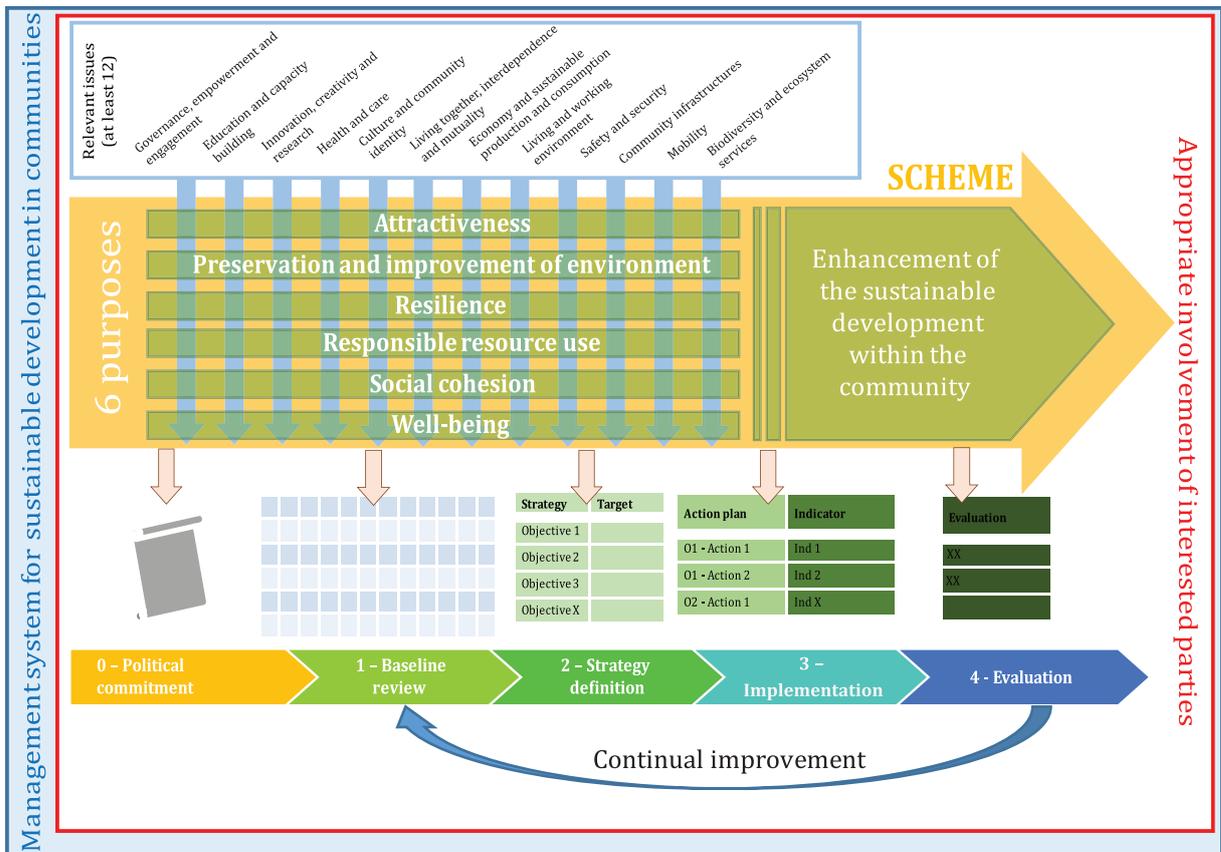


Figure 2 — Diagram illustrating ISO 37101/ISO 37104 methodology in designing and implementing a scheme that contributes to the sustainable development of cities and communities

NOTE See ISO 37101:2016, Clauses 9 and 10.

5.2 Baseline review

5.2.1 Overview

Textbox

What it is

The baseline review is the first step in the sustainability management process when designing a scheme that contributes to sustainable development. It specifies the original starting point, through understanding the local context, mapping the compliance obligations, existing policies and instruments, and projects the expected or effective contribution of the scheme, through assessment and research according to the 12 areas of actions. The matrix of the six purposes and the 12 areas of action should be used as a tool to review the proposed scheme. The 12 areas of action are to be examined, but other areas can be identified depending on the intended scheme in accordance with ISO 37101:2016, 4.6.1.

What to do

The baseline review is about:

- mapping the local situation (including compliance obligations, existing policies, organization set up, financial resources, strengths and opportunities) and the relevant areas of action; identifying interested parties. It is necessary to establish a robust methodology when identifying, collecting and using data information that are useful to perform this task;
- establishing a diagnosis and setting projection against the “matrix” for any proposed scheme;
- benchmarking or peer-learning against relevant comparators (similar cities, national, regional or international standards and policies), which may help to set relevant objectives and achievable targets. It is indeed important to be able to set a reference point from the city perspective and benchmark against this point.

How to do it

ISO 37101 introduced the cross-analysis of six purposes and 12 areas of action as a framework to understand the context of the city, in order to analyse any scheme. At the baseline review stage, a matrix allowing the cross-analysis of the six purposes and the scheme's relevant areas of action provides the discipline for each of these tasks or schemes:

- identifying how existing actions, in each of the relevant areas of action defined, contributes to the six purposes of ISO 37101 by using the matrix;
- using the matrix to communicate and share the diagnosis results of the scheme with interested parties.

Indeed, local governments are invited to examine each of the fields of the matrix and fill in the field, when relevant and appropriate, by answering the following question: "in this area of action, which action(s) has/have been implemented that contribute(s) to this purpose?" The matrix provides a framework that ensures an efficient and complete diagnosis. This diagnosis may be conducted, or at least shared with interested parties.

Expected outputs

The expected outputs from the baseline review are:

- the setting of priorities for a sustainability programme and derived ambitions;
- the setting of a point of reference when monitoring and evaluating progress achievements;
- the mapping of the potential capacity projection that makes it possible to set reasonable targets according to the 6 × 12 framework.

See ISO 37101:2016, 6.1.2.

5.2.2 Mapping the local situation

The first step refers to the assessment of the present sustainable development condition of a city, performed by its local government. A local government creates an assessment framework that later serves as a basis for setting priorities and targets for the co-creation of a strategy and action plan and for the monitoring of progress by making use of indicators. It also refers to an analysis of the challenges and pressures that have led to the current situation as well as the impacts those pressures have on various parts of the society, economy and environment, and the policies and measures already in place. The baseline review summarizes the current status with respect to existing legal requirements, relevant existing policies, objectives and targets and relevant existing instruments. The above documents listed in the baseline review are considered by default, even in the absence of existing sustainable development efforts.

Mapping the local situation is the part of the baseline review where data and information are collected and compiled according to the agreed structure and identified needs and priorities. Mapping the local situation includes:

- a) mapping the city profile
 - reviewing the existing database, information systems and reporting tools to gain information on, for example, geographical, environmental, social and economic aspects and cultural heritage, in order to construct an accurate understanding of the context of the scheme;
 - identifying the relevant sustainability areas of action and highlighting the trends (core set of indicators);
- b) mapping the policy framework
 - legal requirements;

- emerging trends and forthcoming policies;
 - existing political priorities, decisions, commitments and strategies;
- c) mapping the organisational set-up, determining
- relevant responsibilities and organisational set-up;
 - staff capacity and capabilities;
 - good governance arrangements;
 - existing relevant management instruments, procedures and financial capacities;
 - stakeholder landscape, including all relevant actors;
 - the financial resources of the city.

5.2.3 Establishing a diagnosis

The baseline review is the initial diagnosis that helps to review the local situation and governance instruments in place, especially in relation to the UN SDGs.

The cross-analysis matrix of the six purposes and relevant areas of actions defined in ISO 37101 can be used as a basic tool for the initial diagnosis, as a checklist for proposed actions³⁾. [Figure 2](#) provides an example of how this matrix can serve as a tool to map the current and future schemes in the relevant areas of action according to their contribution to the six purposes. In each field or cell of the 6 × 12 cross-analysis matrix, local governments should indicate, when relevant and appropriate (some boxes may remain empty), the actions identified that contribute to the purpose, and should specify the degree of maturity of each action. The result of this cross-analysis matrix analysis will serve as the point of reference when monitoring and evaluating progress achievements, as improvements are only measurable and visible if compared with the ‘point of departure’ (i.e. initial “point of reference”) – the baseline.

3) The Reference Framework for Sustainable Cities (RFSC, www.rfsc.eu) is a good tool to use at this stage. Indeed, the assessment tool provided by the RFSC helps to organize the results of the baseline review and simplify the complexity of the exercise by offering diagrams and visuals. The use of the RFSC at this stage is also helpful to foster and facilitate dialogue between the different stakeholders, offering possibilities to discuss and share the diagnosis.

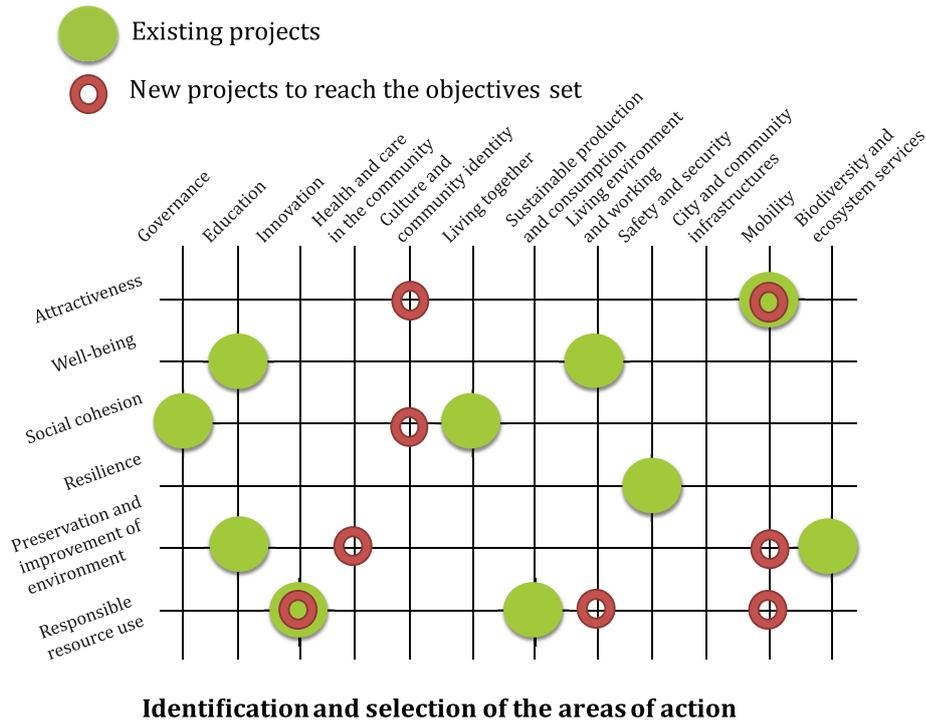


Figure 3 — Example of the cross-analysis matrix

The six community purposes form ‘values’ rather than ‘development goals’. Thus, these are to be regarded as ‘universal’ and should not be prioritized, that is to say they need to be achieved in any organisational, structural, cultural and legal setting, in any of the relevant areas of action.

In the development of a sustainability programme, each of the areas of action is checked regarding its priority to achieve the six community purposes. Thus, it might be that some of the areas of action are just not a priority in the moment of analysis. The areas of action might be subject to change.

5.2.4 Benchmarking against relevant comparators

Baseline review provides the foundation of all the following steps in the management cycle and helps the local government to set reasonable targets and draft a vision and action plan. The initial diagnosis allows identification of the starting point. But an important part of the baseline review is to understand the potential for improvement. If the baseline review is not primarily an exercise for benchmarking with others, benchmarking against relevant comparators may help the local government to set its own ambitions. Relevant comparators include similar cities, national reference values, international references or commitments. The comparison with other cities⁴⁾ can be facilitated through exchanges and bench learning.

4) For example, www.rfsc.eu includes a platform of exchange that allows cities to share good practices and provide visibility to cities that are engaged with sustainability. Similarly, the Club of Cities hosted by TC 268 is about fostering common learning and exchange of practices. In Europe, the Green Capital Cities network plays an important role in promoting the exchange of knowledge and highlighting examples of good practice.

5.3 Defining a strategy for sustainable development

5.3.1 Overview

Textbox

What it is

The definition of the strategy mainly consists in defining the objectives of sustainable development that are key priorities according to the scheme. This is the second step in the sustainability management process. It is about:

- determining city development vision that should be supported by the scheme. At this stage, the role of the leadership is crucial and should be properly addressed;
- setting the strategic priorities and sustainable objectives according to the six purposes by taking into account the needs and expectations of interested parties.

What to do

In order to do so, the local government will:

- a) define local priorities regarding the contribution of the scheme to sustainable development;
- b) set an integrated and realistic strategy, taking into account the human, environmental and financial resources;
- c) define the objectives corresponding to the priorities and related KPIs;
- d) define principles of governance including the promotion of stakeholders' commitment.

How to do it

The analysis of the matrix (six purposes × relevant areas of action) provides the discipline for each of these stages. At this stage, it is important to involve interested parties when appropriate.

Expected outputs

- strategy for sustainable development composed of strategic objectives and realistic expected achievements or targets;
- related KPIs.

References

ISO 37101, ISO 37106 and ISO 37120 can provide useful help at this stage of the sustainability management process.

5.3.2 Setting local priorities to achieve the policy

As a result of the baseline review, local government will have an overview of current conditions at the scale relevant for the scheme and actions carried out as well as an insight into the scope for improvement in different areas of action.

Due to the practicalities of limited resources, local government will most of the time not be able to fill all the gaps immediately. Based on the baseline review, and taking into account the needs and expectations of interested parties, local government should set its priorities and define sustainability objectives (see [Clause 3](#) for definition) according to the six purposes.

This step involves collectively deciding the policy for the city's development and setting local priorities for the scheme based on this vision. At this stage, the relevant commitments and existing political

frameworks identified in the baseline review should be taken into account and reflected. In particular, global and local commitments and existing sustainability frameworks, such as the UN SDGs, should be considered.

5.3.3 Defining objectives of sustainable development, corresponding to priorities

Based on the results of the previous stage, local government will now detail each of the objectives of sustainable development according to the priorities the scheme contributes to.

EXAMPLE For the purpose of attractiveness, the prioritized objectives for the city could include:

- consider innovative methods of improving economic attractiveness:
- attract investors in sustainable economy areas, possibly by means of favourable policies such as offering tax incentives or subsidies for targeted industries or talents;
- improve connectivity infrastructures in order to attract businesses;
- introduce business communication activities such forums or workshops to raise awareness and support;
- improve the cultural attractiveness/corresponding objectives:
- create a regular cultural event of international importance;
- preserve, restore and promote cultural heritage;
- improve the quality of life in the city/corresponding objectives:
- improve the public spaces and living environment to attract residents;
- improve municipal service quality for citizens.

This step is not only about establishing objectives but also about considering the processes necessary to deliver results in accordance with the local government's purposes. The local government should evaluate the contents from the strengths and weaknesses of development, opportunities and challenges, for example by using a SWOT matrix (strengths/weaknesses/opportunities/threats), and evaluate the city's sustainable development to define potential problems.

5.3.4 Setting long-term targets

The vehicles for making priorities a manageable task for local governments are key performance indicators (KPIs) that can connect to strategic objectives and targets. Objectives and targets turn the theory of the policy into 'shop-floor' practice. They mark the optimum targets to be achieved and the 'stepping stones' along the way. Target setting is a crucial moment; this is the point to align local ambitions and global responsibility. A general rule when setting targets for the strategic program is to be smart and set achievable and realistic targets – not too high and not too low.

5.3.5 Defining related key performance indicators (KPIs)

The city will set a list of indicators to monitor progress over time. Indicators and targets are defined in regard to the local context and reflect the political commitment. They are not included in the guidance, but methodological recommendations and tools are provided. In order to define this list, the local government may refer to existing indicator databases, such as ISO 37120⁵⁾. At this stage, a proper and scientifically based methodology needs to be defined to ensure the robustness of the selection, collection and use of data.

NOTE Methodological principles could be taken from, for example, ISO 24523, which was developed for water utilities. The principles are also applicable to this document. These databases generally also provide international references or case studies that could help the city to conduct benchmarking activities.

5) For example, indicators for the UN SDGs, the indicators provided by the Reference Framework for Sustainable Cities (www.rfsc.eu) and the indicators provided in the citykeys final report (H2020 research project).

Textbox: Focus on target settings and selection of indicators

Developing a common vision and clearly identifying priorities is fundamental. Target-setting is important to create commitment and ownership of the scheme and implementation actions and to allow for implementing effective evaluation based on a coherent backcasting-forecasting exercise.

The definition of overall objectives and related targets should derive from a coherent first assessment of main patterns, strengths and weaknesses of the given local context relevant for the scheme. The assessment's aim is in fact to allocate the right level of importance to each aspect, integrating stakeholders' perceptions with objective data. However, the definition of targets and objectives is also a cultural and political fact, influenced by local, national and international contexts.

In any case, there are basically two types of targets:

- targets related to long-term goals (20–30 years);
- targets related to mid-term strategic objectives (5–10 years) or short-term operational actions (1–3 years).

Long-term and short-to-medium-term targets are defined in comparison with a reference or base year, which can be different from indicator to indicator. The base year usually depends on data availability. It is important to bear in mind that in regard to the long-term target, organization can decompose and formulate different short-to-medium-term targets in multiple areas. This framework of long-, mid- and short-term targets prevents local governments from losing sight of the route to become more sustainable.

The long-term targets should be re-assessed regularly, based on results from internal and external audit and political evaluation on whether they have proven suitable or not, whether a new situation requires new ambitious targets, or whether latest scientific research and scenarios have to be included. International context, including agreements and commitments at this level, should also be taken into consideration when reviewing the long-term targets. The results inform local governments when preparing their subsequent sustainable development strategy and action plans.

Choosing the short-term targets for the action plan derived from long-term targets is the next stage. Before setting the short-term targets, the previous year's value (if available) or reference value ought to be taken into account in order to find the right orientation.

The performance parameters can be used to track the progress of achieving the targets and indicators. The city should document the targets and indicators. The information should be provided in a timely manner to the relevant departments and personnel responsible for the implementation.

5.4 Establishing the action plan and planning its implementation

5.4.1 Overview

Textbox

What it is

The strategy for the scheme needs to be supported by a plan of measures or actions, the so-called action plan, in order to substantiate the strategic objectives. The action plan is the short-term operationalization of the strategic program. The action plan should set the operational schedule and name the persons or organizations responsible for each action in order to ensure clarity, quality and accountability of the scheme management, and to prepare to the assessment review process.

What to do

Based on the priorities identified in the strategy, local government should:

- a) establish an action plan to achieve the expected targets;
- b) define responsibilities and schedules for each action and tasks identified (in line with financial resources);
- c) identify suitable policies or regulations in support of specific prioritised action tasks;
- d) define a way to evaluate the progress;
- e) report to interested parties and retain their engagement.

How to do it

In order to establish an action plan, the local government will:

- a) mobilize adequate procedures, incentives, tools (such as risk management/scenario planning), skills and resources that are needed to implement in the relevant areas of action;
- b) identify common risks and common enablers that cut across the relevant areas of action, and hence need managing on a city-wide basis;
- c) define a way to assess, evaluate and report the progress towards the six purposes;
- d) involve interested parties when appropriate.

Expected outputs

The expected outputs from this step are:

- sound action plans explaining the activities to be implemented in order to reach the objectives;
- quantified targets and timeline;
- list of specific tasks with responsibilities and time frame;
- procedures for monitoring and continual adjustment;
- sufficient resources mobilized: procedure, tools, skills, resources.

References

ISO 37120 for indicators; ISO 37106 for tools to identify and manage common risks and common enablers on a city-wide basis.

5.4.2 Establishing the action plan

The action plan sets out the practical steps for implementing the scheme. In order to establish this action plan, the city should identify and determine the different levers (i.e. actions), with respective timelines, in order to achieve the sustainability strategic objectives set in the previous step.

The selection of the different actions, for the relevant areas of action, makes it possible to ensure coherence of the city vision by taking into account the following elements:

- policy coherence with the strategic planning documents of the city;
- review of the ongoing projects and actions in the territory and their integration, or at least consideration in the action plan;
- assessment of the different risks identified for each action (risk analysis);
- identification of common risks that cut across the areas of action, and also of common enablers that would help drive forward progress across the areas.

5.4.3 Managing common risks and common enablers that cut across the areas of action

The strategy and the action plan developed through the process described here are structured around the areas of actions that need addressing in order for the scheme to contribute to deliver the six purposes of ISO 37101. Each of these areas of action is complex and requires the engagement of multiple interested parties with significant levels of expertise in relevant areas and issues. However, there are also factors that cut across many or all areas of action, and these factors should be identified and managed on a concordantly city-wide basis. Furthermore, sometimes the areas of action may conflict with each other and local government should be careful about these potential conflicts, as it should also be aware of the possible synergies that may be offered by multi-purpose measures.

Practical advice and tools focused on smart city operating models to identify and manage such cross-cutting factors are provided in ISO 37106.

Last but not least, cross-sectoral coordination (for example by setting up a cross-departmental working group or a centrally located project team inside the local government organization) may be needed to ensure the consistency of the implementation.

5.5 Conducting performance evaluation and continual improvement

5.5.1 Overview

Textbox

What it is

The ex-post evaluation aims to assess the final contribution of the scheme to the sustainable development of the city and the analysis of the potential performance gaps between the forecast results and the actual measures carried out. This step is also about performing the management review and ensuring continual improvement.

What to do

At this stage, the local government will:

- a) collect data and measure the indicators in order to monitor their evolution against the targets, identify the trends and improve the action plan accordingly;
- b) compare the contribution of the scheme to the six purposes with the baseline review;
- c) identify margins for improvement, review the strategy and review the targets.

How to do

In order to perform these different tasks, the local government will use monitored information and use the baseline review as the reference point for comparison.

Expected outputs

- enhanced KPIs;
- advancement of the six purposes;
- a basis for the next review to be performed in order to continually improve the management system.

References

ISO 37120

5.5.2 Monitoring the city's progress towards sustainable development

Iterative evaluation is an important step and is conceived as part of the whole management system process. Evaluation is a core responsibility for the leadership and governance of sustainability management.

From the initial diagnosis to the revision of the action plan, evaluation as a systematic process compares the achievements with commitments and requirements, contributes to inform the local government with the best choices, and helps to implement a continuous improvement process. It is important to understand that evaluation is not a one-time step, but is part of a cyclic approach: baseline review; planning; implementing; improving. It supports the management system all along the process.

In order to conduct an accurate evaluation, local governments should establish an adequate monitoring system – based on indicators – which includes the scope of monitoring and monitoring aspects, to collect information needed for the evaluation through an appropriate frequency of monitoring, and to document and analyse monitoring results. The evaluation consists of analysing the results provided by the monitoring system in regard to the local situation and to other assessments methods. The resulting conclusions of the evaluation will help decision-makers to determine the effects of the action plan, the performance gaps and corrections needed.

In general, two levels of monitoring should be realized:

- Monitoring of the implementation of the action plan: were the actions implemented on time, within the projected resources, and with which results? This monitoring level is done in the internal audit and verified by the auditor during the external audit. It should be done every year on the basis of realization indicators.
- Monitoring of the impacts of the scheme. For this monitoring level, the baseline review report, the objectives and the KPIs are needed. This monitoring level should be done every 1 year or 2 years and will provide the following results: proof of continuous improvement, performance gaps, basis for corrective measures, input for baseline review report revision and start of new management cycle.

The sources of monitoring data may include:

- statistical system;
- data collected from monitoring points;
- data from stakeholders;
- surveys;
- daily management system.

5.5.3 Continually improving the management system for sustainable development

Regarding the results and the measures of the evaluation at each stage of the management process, corrective actions and continual improvement should be undertaken, especially when performance gaps are observed. Due to the complex nature of progressing towards sustainability, it is likely that uncertainties will persist, and the output may not always fit what has been planned. Therefore, it is crucial that the progress of city sustainable development should be reviewed regularly and corrective and preventive measures adopted wherever applicable. [Figure 4](#) suggests how cities can adopt an evaluation and continual improvement management cycle to perform those tasks effectively over time.

Local governments should document the corrective and preventive measures (including ways to tackle regulatory non-conformity) and review their effectiveness and suitability.

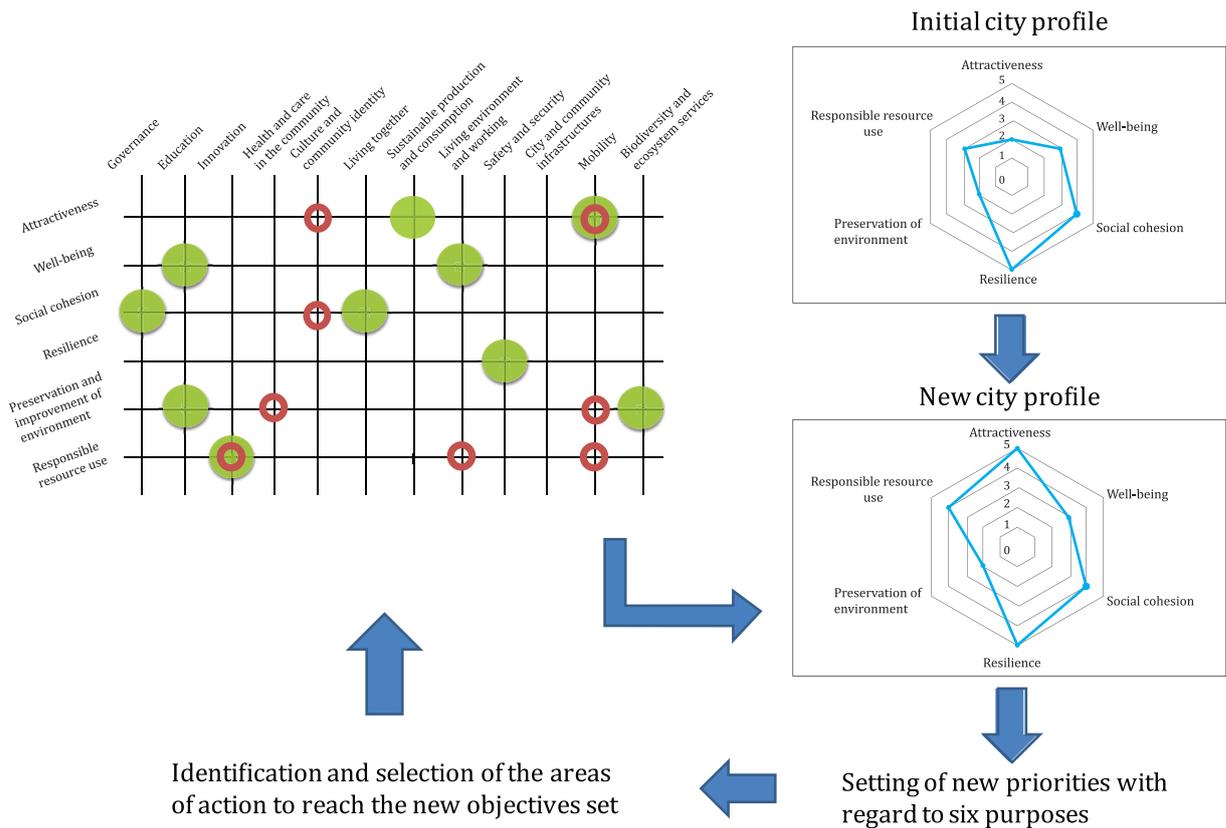


Figure 4 — Example of performance evaluation and continual improvement

5.5.4 Record control

Records provide evidence for the continual operation and results of the sustainable development management system. The records should include:

- information on conformity;
- details of non-conformity, corrective and preventive measures;
- results of the management system review and management review;
- evidence on the targets and indicators;
- results of examination and calibration activities.

It is important that the original records are generated from different sources and can be accessed from different channels (although they can be stored in one main platform), so as to shape an objective picture of city sustainable development.

The key contents of record control include record identification, collection, indexing, filing, storage, maintenance, retrieval and retention.

5.5.5 Management review

Management review aims to evaluate and summarize the performance of the management system for city sustainable development and organizational performance, judge the suitability, adequacy and effectiveness of the system, and make appropriate adjustments to ensure continual improvements. Local government may decide the personnel for management review at their discretion, which should normally include the management representatives of city sustainable development, management staff and principals of relevant departments. The management review can form part of the monitoring the

city's progress towards sustainable development (5.5.2) as connections and influential factors can be cross-analysed.

Management review is typically conducted once every 12 months, usually after a full internal review, under the responsibility of the city council. The management review process should be recorded. The contents may include a meeting agenda, a list of participants, presentations or copies of meeting materials, as well as archive materials decided by regulators, reports, meeting minutes and a track system. The results should form a review report. The management review may be carried out in the following steps:

- a) formulate a plan to determine the requirements for time, purpose, contents, participants and input information for management review;
- b) implement the management review and record the review process;
- c) prepare the review report, including: system suitability, adequacy and effectiveness of the evaluation, measures for improvement;
- d) implement the improved measures in a timely manner and approve the certification of impacts.

Textbox: management review input and output

Review input

Review input means to provide information for a management review. Adequate and accurate information is a prerequisite for the effective implementation of the management review. Review input includes, but is not limited to:

- the results of review, including internal and external reviews to evaluate whether the management system for city sustainable development can operate effectively;
- feedback of interested parties, exchange of information with interested parties, including complaints;
- the operation report of the management system for sustainable development (e.g. data, performance and information);
- statistics, which includes quantitative and qualitative data, from surveys;
- follow-up measures of the previous management review;
- the objective changes of the management system for sustainable development, including developments and changes of laws and regulations related to organizational departments and other requirements;
- suggestions for improvement.

Review output

Review output is an important basis for the city council to make strategic decisions on the management system for sustainable urban development. Review output includes, but is not limited to:

- appropriate, adequate and effective evaluation of the management system;
- improving decisions continually and making any improvements needed to the management system, including identifying unqualified content and the reasons for its inclusion, as well as measures to prevent recurrence. Local government should design a roadmap for continual improvement and communicate decisions on sustainable development;
- important strategic decisions in terms of new tasks, new programs, new capital investments, new policy or regulations to be released, in order to enhance the city's sustainable development.

6 Support for the management system

6.1 Resources

The local government should determine and provide the resources needed for the establishment, implementation, maintenance and continual improvement of the management system for sustainable development, for example natural, financial, human, technological and operational resources.

NOTE 1 Such resources include those offered by local people, organizations and infrastructures, as well as those embedded in the culture of a community and place.

NOTE 2 See [4.2](#).

Textbox

The resource base and organizational structure of smaller cities can present limitations on sustainable development management system implementation. To overcome these limitations, these cities can consider cooperative strategies. Options can include cooperation with:

- other cities, to share knowledge and good practices;
- local associations of citizens, to promote local initiatives in favour of sustainable development;
- the private sector;
- universities and other research centres, to support performance improvements and innovations.

6.2 Competence

The local government should:

- determine the necessary competence of person(s) doing work under its control that affects its performance in sustainable development;
- ensure that staff are competent on the basis of appropriate knowledge, skills, training or experience;
- where applicable, take actions to acquire the necessary competence, and evaluate the effectiveness of the actions taken;
- retain appropriate documented information as evidence of competence.

Applicable actions can include, for example, the provision of training to, the mentoring of, or the reassignment of current staff; or the hiring or contracting of competent persons. Having mapped its capabilities, the local government should plan to offer training to those in charge of implementing elements of this document.

NOTE See [4.3.2](#).

6.3 Awareness

Staff doing work under the local government's control and all interested parties should be aware of:

- the policy for sustainable development;
- their contribution to the effectiveness of the management system for sustainable development, including the benefits of improved performance in sustainable development;
- the implications of not conforming to the requirements of the management system for sustainable development.

Textbox

The local government has a key responsibility for building awareness in the city in relation to the sustainable management system. This includes, for example, making employees and staff working under the local government's control aware of the city's values in sustainable development and how these values can contribute towards the city's strategy.

The local government should ensure staff working under the local government's control are encouraged to:

- enhance sustainable development performance;
- contribute toward achieving the intended outcomes of the sustainable development management system;
- accept the importance of achieving sustainable development objectives for which they are responsible or accountable.

The local government should also ensure that staff working under the local government's control are made aware of:

- the local government's policy and its commitment to sustainable development;
- the importance of conforming to the requirements of the sustainable development management system;
- the contribution to the effectiveness of the sustainable development management system;
- the benefits of improved sustainability performance;
- the responsibilities and accountabilities within the sustainable development management system;
- the significant actual or potential sustainability aspects and associated impacts of work activities;
- the identified risks and opportunities that need to be addressed in relation to their work activities, if applicable.

Examples of methods to increase awareness can include internal communication, visual signs and banners, campaigns, training or education and mentoring.

6.4 Communication

The local government determines the need for internal and external communications relevant to the management system for sustainable development, including:

- a) a choice of topics on which it will communicate;
- b) when to communicate;
- c) with whom to communicate;
- d) how to communicate.

NOTE See [4.4.2](#) and [4.4.3](#) regarding communication with interested parties.

Textbox

The local government should communicate the importance of effective sustainable development management and of conforming to the management system requirements. The local government should ensure that the following are communicated within the city:

- the overall policy;
- the responsibilities and authorities for relevant roles.

The local government should communicate:

- its strategy for sustainable development objectives;
- its relevant sustainable development requirement(s) to external providers, including contractors;
- relevant sustainable development performance information both internally and externally, as determined by its communication process(es) and as required by its compliance obligations.
- how its scheme contributes to the UN SDGs.

The local government should ensure that the results of internal audits are reported to relevant management.

6.5 Documented information

6.5.1 General

The documented information of the local government's management system for sustainable development includes:

- documented information required by this document;
- documented information determined by the local government as being necessary for the effectiveness of the management system for sustainable development;
- information on the population size of the city and its strategies, programmes, plans, projects, activities, products and services;
- information on the complexity of processes and their interactions;
- information on the competence of staff.

Textbox

The local government should maintain the following as documented information:

- the scope of the sustainable development management system;
- the sustainable development policy;
- its identified risks and opportunities that need to be addressed;
- its compliance obligations;
- information on the objectives of sustainable development;
- information related to the operational control processes needed to meet the sustainable development management system requirements, to the extent necessary to have confidence that the processes have been carried out as planned;

The local government should retain documented information as evidence (records) of the following:

- competence, as appropriate;
- its communications, as appropriate;
- monitoring, measurement, analysis and evaluation results, as appropriate;
- compliance evaluation result(s);
- implementation of the audit programme, and the audit results;
- the results of management reviews;
- the nature of identified non-conformity and any subsequent actions taken, and the results of any corrective action.

Other examples of documented information include descriptions of programmes and responsibilities, procedures, process information, organizational charts, and internal and external standards.

6.5.2 Creating and updating

When creating and updating documented information, the local government should ensure appropriate:

- identification and description (e.g. a title, date, author or reference number);
- format (e.g. language, software version, graphics) and media (e.g. paper, electronic);
- review and approval for suitability and adequacy.

6.5.3 Control of documented information

Documented information required by the management system for sustainable development and by this document should be controlled to ensure:

- a) it is available and suitable for use, where and when it is needed;
- b) it is adequately protected (e.g. from loss of confidentiality, improper use or loss of integrity).

For the control of documented information, the local government should address the following activities, as applicable:

- distribution, access, retrieval and use;

- storage and preservation, including preservation of legibility;
- control of changes (e.g. version control);
- retention and disposition.

Documented information of external origin determined by the local government to be necessary for the planning and operation of the management system for sustainable development should be identified, as appropriate, and controlled.

NOTE 1 Access can imply a decision regarding the permission to view the documented information only, or the permission and authority to view and change the documented information.

Textbox: Focus on internal auditing

The aims of an internal audit include:

- to determine whether the sustainability areas of action and their evaluation are up to date;
- to determine whether the sustainability strategy is up to date;
- to compare present status and realization/implementation of the action plan;
- to compare present status and progress towards achievement of sustainability targets;
- to check whether the laws and regulations of relevance to sustainable development have been updated and are being followed through;
- to check the management system functions: organization, documentation, internal and external communication, monitoring and reporting;
- to check updates to, adherence to and implementation of the training plan for employees;
- to receive input and experiences regarding improvements.

Impartiality, objectivity and competence of auditors are basic prerequisites for an effective and consistent internal audit. Therefore the local government must safeguard the maintenance of policies, procedures, and practices directly related to the auditor's impartiality and competence. The internal auditor needs to be a person or a team with sufficiently profound knowledge regarding structure and competences of local government and independent from the coordination team. This person or team could come from the strategic department of the local government, from a regional authority or from another city (peer-to-peer review). Within an annual procedure, the internal auditor evaluates the management process and achievements as the basis for a subsequent cycle.

NOTE 2 ISO 19011 provides guidance on auditing management systems, including the principles of auditing, managing an audit programme and conducting management system audits, as well as guidance on the evaluation of the competence of individuals involved in the audit process, including the person managing the audit programme, auditors and audit teams. ISO 19011 is applicable to all organizations that need to conduct internal or external audits of management systems or manage an audit programme.

Annex A (informative)

ISO 37101 and ISO 37104 support the UN sustainable development goals (SDGs)

A.1 General

This document aims to provide a first exploration of the relationships between the sustainability framework supporting ISO 37101 (six purposes × 12 areas of action) and the sustainability framework of the SDGs. After a brief presentation of the two frameworks, the second part of this annex draws parallels between them.

A.2 Introduction — Presentation of the two frameworks

The following table summarizes the two approaches:

ISO 37101	The 17 UN SDGs (2015)
— Scope: standard addressed to “communities” but especially cities	— Adopted during New York sustainable development summit in 2015
— Communities as stepping stones towards sustainability of society as a whole	— Following the Millennium Development Goals
— 6 × 12 framework of 37101	— Concept of “5 Ps” of sustainable development, 17 objectives, 169 targets and 241 indicators
— The standard aims at establishing the requirements of a management system for sustainable development in communities, to create a more sustainable future for all communities	— Key role of UN Development Programme in implementation of SDGs
— The chosen organization shall establish, implement, maintain and continually improve a management system for sustainable development in communities	— Commitment of national governments to reach the targets before 2030
— Plan-Do-Check-Act model	— Systemic and integrated approach of sustainable development (interactions between the different SDGs)

ISO 37101 and the UN SDGs have a common approach in that both promote at international level a renewed vision for sustainable development that is holistic, integrated and shared between different actors. Both acknowledge the key role of local and regional governments in the implementation of commitments and strategies defined at international and national levels and recognize the need to ‘operationalize’ the concept of sustainable development.

A.3 Drawing parallels between the two frameworks

A.3.1 The purposes of sustainable development

Originally defined in the Brundtland report⁶⁾, sustainable development refers to the “development that meets the needs of the present, without compromising the ability of future generations to meet their own needs.” The report provides a synthetic and basic definition of sustainable development organized according to three pillars: economic, social and environmental.

6) Report of the World Commission on Environment and Development: Our Common Future. Transmitted to the General Assembly as an annex to document A/42/427, Development and International Co-operation: Environment, 1987.

ISO 37101 and the 17 UN SDGs both include a concise and integrated vision of the main purposes of sustainable development. Very close to the three pillars, but renewing this vision, the “six purposes” of ISO 37101, as well as the “5 Ps” of the UN SDGs, provide a conceptual approach for working towards sustainable communities.

The six purposes of ISO 37101	The “5 Ps” of the UN SDGs
Preservation and improvement of the environment → Planet	Planet
Responsible resource use → Planet	Partnership
Social cohesion → Partnership	Peace
Attractiveness → Prosperity	Prosperity
Resilience → Peace	People
Well-being → People	

A.3.2 Sustainability areas of action

These global purposes are supported by more specific concepts: 12 areas of action for ISO 37101 and 17 SDGs for the UN framework. Each ISO 37101 “issue” (the so-called “area of action” in ISO 37104) corresponds to one or several SDGs. Moreover, ISO sustainability areas of action highlight interactions between the SDGs and thereby aid the design of cross-disciplinary, multi-purpose and well-integrated policies and actions.

12 sustainability areas of action	17 goals
Governance, empowerment and engagement → Goals 16, 17	1) No poverty
Education and capacity building → Goal 4	2) Zero hunger
Innovation, creativity and research → Goal 9	3) Good health and well-being
Health and care in the community → Goals 2, 3, 11	4) Quality education
Culture and community identity → Goals 11, 16	5) Gender equality
Living together, interdependence and mutuality → Goals 1, 5, 10, 15	6) Clean water and sanitation
Economy, sustainable production and consumption → Goals 2, 8, 12	7) Affordable and clean energy
Living and working environment → Goal 11, 13, 15	8) Decent work and economic growth
Safety and security → Goal 13, 16	9) Industry, innovation and infrastructures
Community infrastructures → Goals 6, 7, 9, 11	10) Reduced inequalities
Mobility → Goals 9, 11	11) Sustainable cities and communities
Biodiversity and ecosystem services → Goals 13, 14, 15	12) Responsible consumption and production
	13) Climate action
	14) Life below water
	15) Life on land
	16) Peace, justice and strong institutions
	17) Partnerships for the goals

A.3.3 “Operationalizing” the concept of sustainable development

Although every city or community needs to find its own pathway towards the achievement of these purposes, both frameworks provide useful methodological approaches to support implementation. As the following table shows, each of the two frameworks provides methodological direction for cities and communities seeking to develop locally-tailored approaches.

ISO 37101: Management system with PDCA model	Roadmap for localizing the SDGs
<p>1) <i>Plan</i> (strategic steps): plan and target setting = define the organization, identify relevant purposes and areas of action, interested parties, build a vision/mission and a sustainable development policy, allocation of roles and responsibilities</p> <p>2) <i>Do</i> (operational steps):</p> <ul style="list-style-type: none"> — measures: action program = planning of objectives and plans according to the areas of action — mobilize necessary resources — implementation mechanism = operation <p>3) <i>Check</i>: evaluation with the use of metrics and indicators, internal audit</p> <p>4) <i>Act</i>: corrective actions and continual improvement</p>	<p>1) <i>Awareness-raising</i>: carry out awareness-raising and communication campaign to increase the commitment of local and regional governments to the SDGs</p> <p>2) <i>Advocacy</i>: advocate for national strategies to reflect the needs and concerns of local and regional governments</p> <p>3) <i>Implementation</i>:</p> <ul style="list-style-type: none"> — establish priorities and draft action plan related to the 17 SDGs based on local contexts — identify and mobilize the resources needed — implement the actions <p>4) <i>Monitoring</i>: collect, monitor and analyse data, promote the participation of various stakeholders in the process of monitoring and reporting</p>

A.3.4 Evaluating performances

Each framework provides tools for performance evaluation. It could be meaningful to combine:

- the indicators adopted by the UN for the SDGs (229 without duplication); and
- the maturity matrix provided in ISO 37101, with its four steps: i) start-up – isolated initiatives; ii) establishing coherent framework; iii) integration and embedding; iv) leadership and innovation.

The maturity matrix can be used to measure countries' advancement towards targets specified in the SDGs, while also ensuring mature and sustainable development as countries move forward in the matrix (from step 1 to step 4). Since the initial situation is not the same for all countries it is necessary to use relative terms, for example 'number of new targets achieved since 2015.'

Clearly, the two frameworks are complementary in helping communities to develop an 'operationalized' and communicative approach to sustainable development.

What does ISO 37101 bring to the SDGs?	What do the SDGs bring to the standard?
<ul style="list-style-type: none"> — Precise implementation procedures through the notion of the management system (operationalization) — Maturity matrix to monitor countries' advancement and ensure maturity in approach and sustainable outcomes, a flexible, reflective and responsive process rather than tick-box sustainability targets — Continual improvement 	<ul style="list-style-type: none"> — Readability and possibility of communication — List of indicators and direction for planning and implementation sectors/themes — Link between different scales of governance (international, national, local)

Annex B (informative)

B.1 General

This annex contains case studies from cities and other local communities in the world illustrating how ISO 37101 can be implemented at local level. The case studies presented in this annex do not necessarily fully apply ISO 37101, but they show organized approaches to their work which are similar to what is being recommended in this document.

It is expected that examples from more countries will shortly become available, given the recognition from the international community that local governments and their partners have an essential role in delivery of the UN SDGs.

B.2 Case study — Hangzhou public bicycle system (China)



B.2.1 City profile



Hangzhou, the capital of Zhejiang Province in China, is the first pilot city globally committed to test ISO 37101. Hangzhou is recognized as the key national tourism city by central government. It is an historical and cultural city, with an urban area of 3,068 km², accommodating about 9 million people. Hangzhou has been known as “China’s happiest city” for four consecutive years. It received the International City Management Award: the second prize of Tehran “Golden Brick” in 2015.

Hangzhou was recognized as “one of the global top 8 cities providing excellent public bicycle service” by the BBC. The trial of the public bicycle service system in Hangzhou began on 1 May 2008, and has become one of the largest in the world. There are currently 3 582 service spots and 84 100 public bicycles in total. The public service project is also economically self-sustaining.

B.2.2 Key achievements

— Peak daily use is 448 600 person-trips, with an average use of 260 000 person-trips.

ISO/FDIS 37104:2018(E)

- More than 96 % of the users can hire bicycles for free.
- Total income for 2016 was about 77 million RMB, generated through, for example, advertisements, training programs and renting.
- The scheme is anticipated to reduce emissions by about 2 294 900 tonnes CDE per year.

B.2.3 Good lessons to share

Interventions:

- A Public Bicycle Transport Development Plan was produced, which established a network around key city nodes such as bus/underground stations, residential communities, business districts, schools, offices, institutions, public building facilities and scenic spots, roughly one service spot every 300 meters.
- Integrated network operation. Bikes can be borrowed and returned anywhere in the city.
- Self-service operated and smartly managed.
- Free for a fixed time but with a charge for overtime, with a deposit to guarantee.
- Adoption of universal cards for both renting bicycles and taking buses.

Implementation mechanism:

- Set up a standardised management model to provide high-quality service.
- A new specialized organization was set up jointly by the standardization institute and the operation institute, taking the standards as a carrier, to communicate with and achieve harmonization between various stakeholders.

Evaluation and continual improvement:

Questionnaires are designed to collect customer opinions regarding “brand images”, “expected quality”, “perceived quality”, “perceived value” and “customer loyalty”.

B.2.4 Contribution towards standardization

Stakeholder participation

- The departments of urban management, traffic police, public transportation and street community determine the service network and key nodes together. The city Urban Management Committee plays a leading role in this process.
- The city introduced the programme of “bicycles networks enter neighbourhoods” and started the pilot of a public bicycle scheme “built by society and enterprises together”. The city increased its staff and implemented training in neighbourhoods for new employees.

Documentation

- DB3301/T0011-2013 Urban Public Bicycle Operation Guarantee Management Service Specification (regional standard).
- DB33/T 898-2013 Urban Public Bicycle Management Service Specification (regional standard).
- Urban Public Bicycle Service Specification (national standard) (in process).

B.3 Case study — Les Parisculteurs, Paris, France



B.3.1 General

In Paris, rooftops are an important leverage in order to reach the local goals of climate change adaptation and biodiversity preservation, especially as spaces dedicated to urban agriculture development. The *Parisculteurs* programme was launched by Anne Hidalgo, Mayor of Paris, in 2016. It has since achieved four of the first five steps of this document's method:

- **Commitment:** in 2014, the Mayor of Paris promised the greening of 100 hectares on the walls and rooftops of Paris by 2020, including 33 ha of urban agriculture. This was formalized through the creation of the “100 hectares charter” in 2016.
- **Baseline review:** 80 ha of rooftops holding a strong potential for urban agriculture, according to a study conducted by the Paris Urbanism Agency in 2013 (<https://www.apur.org/fr/nos-travaux/etude-potentiel-vegetalisation-toitures-terrasses-paris>).
- **Strategy:**
 - Several successive calls for projects, on a selection of public or private sites depending on the proposition of the “100 hectares charter” signatories. The rooftop or wall sites are distributed around Paris, and all the districts (“arrondissements”) welcome at least one urban agriculture project. A diversity of agricultural projects (productive, leisure-oriented, corporate) is encouraged.
 - These calls for projects are dependent on the charter signatories and aim at improving the leverage of public initiative on private action. To date, one-third of the sites are publicly owned and two-thirds are privately owned.
 - The whole process relies on a communication strategy targeting the rooftop owners, the potential site managers and the public. Paris has launched a dedicated website and database, as well as a LinkedIn group that quickly became the widest professional network on urban agriculture in Europe. The *Parisculteurs* program has also organized several technical workshops on the rules and methods for urban agriculture on rooftops.
- **Implementation:** an “urban agriculture taskforce” has been created within the Department of Environment and Green Spaces and oversees the calls for projects and the animation of the network. Consultants are contracted for project management assistance and institutional experts provide support on technical or strategic issues.

The taskforce’s workplan is supported by an information system to ease project reporting, massive technical data management on about a hundred sites, and decision-making at a technical and political level. This system allows the taskforce and its project management assistance team to run successive calls for projects (e.g. potential sites analysis, project selection, technical assistance for on-site installation) efficiently.

The programme is now at its evaluation stage, which has four components:

- mid-term review regarding the fundamental target of 33 ha of urban agriculture by 2020;
- mandatory evaluation as part of the national funding of the programme by the 'Ville de Demain' investment plan for urban development;
- environmental evaluation of the launched projects, demanded by the city council and partly conducted in May 2018;

- feedback on the experience and on the project management.

This document can be used in support of the *Parisculteurs* programme to ensure the coherence and the sustainability of the multi-level evaluation process, as well as the replicability and international comparability of the program.

While the *Parisculteurs* programme already follows the different steps recommended by this document, the grid of the six purposes and 12 areas of action for sustainability could be used to define new performance indicators. Their contribution would be to widen the scope of evaluation, from purely environmental and economic aspects to more inclusive issues, and to better coordinate overall evaluation of the programme with the evaluation of each site project.

B.3.2 The main achievements of the *Parisculteurs* programme

- Situational analysis in June 2018

Call for projects	Available sites	Allocated sites	Operational surface	Jobs and agricultural outputs
Parisculteurs 1	46 sites 6,99 ha	33 projects 5,5 ha	14 projects launched 1,2 ha	128 000 kg of production 1,000 patches 18 jobs (FTE)
Parisculteurs 2	43 sites 10,1 ha	33 projects 9,1 ha	Projects launched from June 25	
Parisculteurs 3	Preliminary studies ongoing			

Additionally, the *Parisculteurs* programme aims to bring together all initiatives linked to urban agriculture, through the dissemination of technical feedback and organization of professional workshops. Private initiatives count towards reaching the target of 33 ha of urban agriculture by 2020.

B.3.3 This document's contribution to the *Parisculteurs* programme

- Review of the programme management

Firstly, the five-step process proposed by this document (from commitment to evaluation and continual improvement) strengthened the management of the *Parisculteurs* programme, which broadly corresponds to this structure.

There is potential for Steps 3 and 4 (strategy and implementation) to be examined in detail at the end of the programme in 2020 when the city council may decide to renew its commitment with a different organization. In the meantime there is already continual improvement from one call for projects to another.

- Integration of the fundamental goals of the programme

Secondly, the expected outcomes of the *Parisculteurs* programme were integrated into this document's grid (six purposes and 12 areas of action of sustainability). This allows the programme to question and maximize its positive outcomes, including those that are additional to the initial goals.

The urban agriculture taskforce first used this grid for integration of the initial goals (jobs created, diversity of plants cultivated, number of charter signatories).

- Definition of additional goals

Analysis of the grid allowed the taskforce to explore possible actions and indicators on additional outcomes of the programme. Some expected outcomes not previously documented by indicators were given more priority within the global strategy and an action plan for their management and evaluation was created. Some other possible outcomes were judged not to be essential.

For instance, effective ways to increase the involvement of Parisian economic actors in the programme and their commitment to the charter include promoting their property assets or referring to their commitment to social and environmental responsibility.

The grid also simplifies diffusion of the project selection methodology to future calls for projects on urban agriculture launched by local governments.

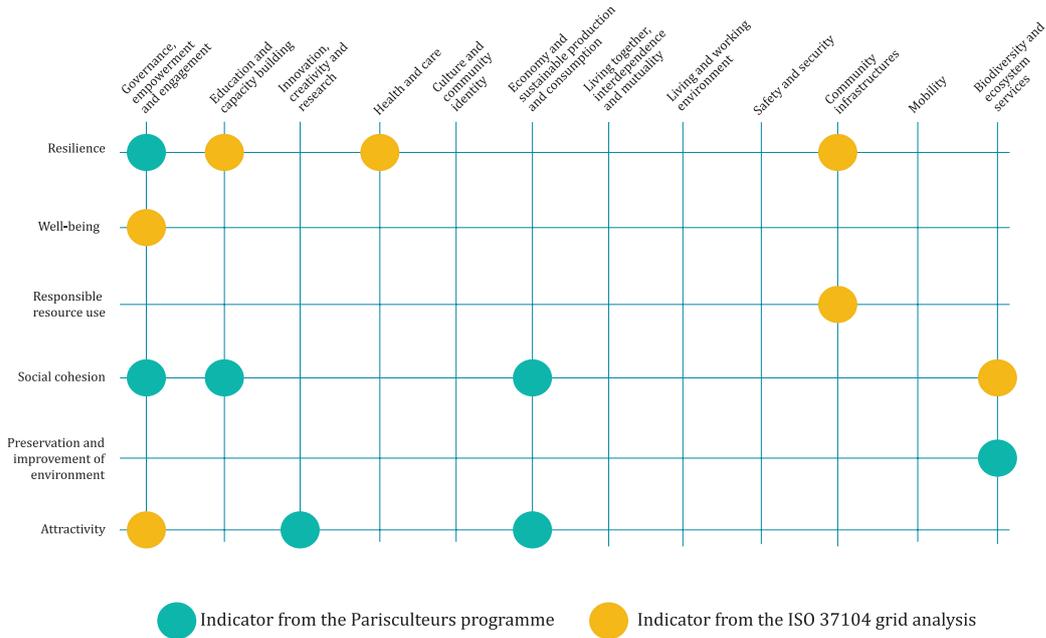
The definition of additional objectives, less directly linked to agricultural issues, represents an opportunity for the taskforce to involve other departments of the Paris city hall, and other social or economic institutional actors.

Finally, the grid served as a support for brainstorming on the potential contribution of the programme to issues not considered in the initial strategy. New levers of action (such as diminution of the urban heat island effect, improvement of storm water management, and promotion of the regional food heritage and old varieties of plants) were identified and will be developed as part of the implementation or evaluation. Some of these outcomes might also be considered as part of the selection criteria for the next calls for projects.

B.3.4 Example of new goals and indicators for the programme

In the following list and diagram, fundamental goals of the *Parisculteurs* programme are displayed in *italics*, and additional objectives (identified during the grid analysis) are displayed in **bold**.

- *Average duration of the agreements between site owners and project operators* (Governance/Resilience).
- **Integration of urban agriculture in CSR policies** (Governance/Well-being) – *indicator to be determined*.
- *Number of signatories of the “100 hectares charter”* (Governance/Social cohesion).
- **Diffusion of the call for projects strategy to other local governments implementing urban agriculture development policies** (Governance/Attractivity) – *indicator to be determined*.
- **Number of people trained in market gardening during the programme’s workshops** (Education/Resilience).
- *Number of public visitors on the launched sites* (Education/Social cohesion).
- *List of innovative agricultural solution developed on sites* (Innovation/Attractivity).
- **Average temperature on rooftops and around the sites/diminution of the urban heat island effect** (Health/Resilience).
- *Number of volunteers active on each project* (Economy/Social cohesion).
- *Number of full-time equivalent jobs created* (Economy/Attractivity).
- **Quantity of storm water reused and diverted from the sewage network** (Community infrastructures/Resilience).
- **Share of green or organic waste composted on site** (Community infrastructures/Responsible resource use).
- **Number of regional or old varieties of plants cultivated on site/promotion of the local food and agriculture legacy** (Biodiversity/Social cohesion).
- *Diversity of flora and hosted wildlife/number of species* (Biodiversity/Preservation and improvement of environment) – *indicator to be determined*.



B.4 Case study — Achieving Saint-Fons socio-territorial resilience (France)



B.4.1 City description



Saint-Fons is a commune of 17 000 inhabitants, located in the Auvergne Rhône Alpes region of eastern France and the metropolis of Lyon. With an urban area of 600 ha, Saint-Fons is one of the six communes constituting the Vallée de la Chimie, the area located to the south of Lyon with an important concentration of chemical industries.

B.4.2 Why this city?

Following a request for support to address the “households in energy precariousness” in Saint-Fons in 2014, several workshops with elected officials, technicians, experts, urban planners and inhabitants took place. The municipality is vulnerable to multiple risks. Economic and social vulnerability stem from the relatively high presence of precarious and energy-poor households (74 % of households with modest income, one third below the poverty line, 53 % social housing, 21 % unemployment rate). Commercial and arts-and-crafts activities in the area are fragile and in regression. Spatially, the commune is geographically isolated, lacks public transport and has only limited access to the major city

of Lyon. Environmental vulnerability stems from the existence of significant industrial risks linked to the presence of chemical industries (about 50 % of the urban area is occupied by industrial plants).

The need for an overall framework to tackle vulnerability represented a good opportunity to test a new approach to sustainable development, and so achieve strong and holistic socio-territorial resilience – one of the six purposes of sustainable development defined by ISO 37101, relating to the “capability of a system to maintain its functions and structure in the face of internal and external change”.

A strategy for sustainable development in Saint-Fons has been developed based on ISO 37101 and the 17 UN SDGs, supported by the use of the Reference Framework for Sustainable Cities (RFSC) webtool.

B.4.3 Key achievements

- Improvement of living conditions: urban renewal, measures against pollution and incivilities, improvement of housing and well-being, promotion of green, flowered spaces, collective gardening.
- Enabling of soft and sustainable mobility: intercompany car-sharing, intra-urban shuttle, promotion of cycling and development of a bypass to limit the traffic in the city centre.
- Technological risk prevention and management, cooperation for experimentation and exchange of good practices.

B.4.4 What is being done? (PDCA process)

- 1) Plan and target setting: 2017 – Municipal Framework Plan “*Saint-Fons sustainable territory 2030*”
 - Key target: achieve global socio-territorial resilience.
 - Holistic and integrated approach: build a common vision of sustainable urban development, shared by all involved actors, combining short-term and long-term perspectives.
 - Multi-level governance framework: coherent articulation of local strategy with other scales of public policy intervention (metropolitan, national public policies, RFSC calibration and 17 SDGs), education, awareness-raising and valuing the contribution of citizens' actions.
 - Sustainable development strategy elaborated on the results of the reference analysis: identification of priorities and challenges by using the first module of the RFSC, “Check your strategy”. For Saint-Fons: focus on social concerns and rising environmental/health concerns.
- 2) Measures: action program

A set of actions based on the SDGs has been defined. Their impact and consistency with the ambitions of the strategy have been assessed using the second module of the RFSC, “Assess your project”. Assessment of the links between implementation actions and the sustainable development purposes and areas of action provides a means for improving the position of Saint-Fons in as many fields as possible in the maturity matrix.

- *Attractiveness (culture and community identity)*: reinforce the attractiveness and influence of the city, promote the local heritage.
- *Preservation and improvement of environment (health and care and in the community)*: improve the size and quality of green spaces, limit urban pollution caused by traffic.
- *Resilience (safety and security)*: become a leading city for technological risk management (especially through inhabitants' information and training).
- *Responsible resource use (mobility)*: “eco-mobility” policy to promote sustainable transport.
- *Social cohesion (mobility)*: ambitious multi-modal policy to open up the commune of Saint-Fons and enable mobility for everyone, even for those who cannot afford to have a car.

- *Well-being (living together, interdependence and mutuality/living and working environment):* “better living conditions” policy. Urban renewal, develop a pedestrian city centre, reinforce awareness campaigns against incivilities and degradation, mixed and balanced housing program.

3) Implementation mechanism: management system

Establish an organization to develop a “policy for sustainable development” as a system to tackle both vulnerabilities (to deal with shocks) and transitions (to move towards a robust territory). This organization should be able to create local value and identity and make actions visible and comprehensible.

4) Evaluation and continual improvement

There is a recognized need for appropriate and articulated indicators at different stages of the PDCA process; the use of the third module of the RFSC, “Monitor your progress”, to identify general performance and result indicators linked to the strategy and its ultimate objectives has helped to start this work. Monitoring indicators linked with the implementation of actions to reach the objectives are also provided through this step.

Stakeholders participating in the project: the City of Saint-Fons/Lyon Urban Planning Agency/ Cerema (National Centre for Studies and Expertise on Risks, Environment, Mobility, and Urban and Country planning).

B.5 Case studies — Culture and community identity (United Kingdom)



B.5.1 Description

- Actions shared: creativity provides significant ways to connect people, communities and cultures. Community outreach and engagement support and facilitate these connections.
- Creativity contributes to individual well-being, healthier, more resilient communities and a greater understanding of both personal and community identity.

B.5.2 Background analysis

- Positioning: quantitative and qualitative analysis/research is necessary in identifying geographic areas, demographics and communities of interest in/with which to develop creative opportunities.
- Site investigation: when developing creative opportunities it is important to identify easily accessible and appropriate venues, readily available at times to suit prospective participants/community partners.
- Status mapping: research by Arts Council England identified areas of low/negligible cultural engagement (cold spots) with significant scope for developing creative opportunities and a greater degree of participation in the culture/heritage sector. The Creative Case for Diversity provides a framework and impetus to address existing social, economic and health inequalities. The New Economics Foundation has identified Five Ways to Wellbeing underpinning community practice. Postcode analysis and Google mapping help identify areas where community outreach approaches can be most effective.

Physical disability, communication difficulties and dementia all contribute to the problems many people experience in accessing cultural opportunities and the heritage sector. The Wordsworth Trust of Grasmere, Cumbria, addresses these areas of action through its access, outreach and engagement

work in collaboration with members of the groups, their families and friends, community partners and volunteers.

B.5.3 First case study: Maryport

B.5.3.1 Town description

Maryport is a Cumbrian town in the borough of Allerdale in the north-west of England. It has a population of 11 262 (2011 Census).

The Park Hill Poets meet regularly at COSC in Maryport, a day Centre for adults with physical disabilities. The Wordsworth Trust's outreach team has supported and facilitated the group since 2014. The poets write both individually and collaboratively and are powerful advocates for a wider recognition of the skills, talents, experience and expertise of people with disability. They use their group poems to demonstrate this to the wider community of Maryport and neighbouring coastal towns and villages and have published and broadcast their work county-wide. The Trust has facilitated a touring exhibition of their poetry, *Every Picture Tells a Poem*, in community venues across the county, offering outreach opportunities at each. Working closely with the poets and COSC, the Trust has twice exhibited their work, hosted readings and workshops with the poets on site, and taken their work and promoted their creative approach to writing in community venues and learning institutions regionally, in Northern Ireland and north America. The outreach team has linked the poets with other writers regionally, facilitating poetry conversations between diverse communities, connected them with overseas visitors through the museum (including visitors from China) and edited a collection of the poets' work, "What are Words Worth" (June 2017).

B.5.3.2 What has been done

- Background analysis: Government figures published in January 2014 indicate that more than 11 m people in the UK live with some form of disability. "Around 30 % of disabled people experience difficulties related to their impairment in accessing public, commercial and leisure goods and services". The Government published 'Fulfilling Potential – Improving the Lives of Disabled People' in 2011 and updated their national strategic Disability Framework in December 2015.

B.5.3.3 Targets and indicators

- Targets: to develop community access to literature/literary heritage; promote and facilitate creative responses among adults with physical disabilities; raise awareness and generate a greater understanding of disability, capacity and creativity among the wider community; share and develop such initiatives nationally and internationally.
- Indicators: to be established with reference to ISO.

B.5.3.4 Good lessons to share

- Measures are difficult but useful.
- Cultural engagement can be promoted through outreach.
- Raise awareness of opportunities/resources available through wider heritage sector.
- Improves access to central Wordsworth Trust's collections and expertise.
- Central hubs can provide practical support and appropriate materials.
- Develop community practice to share collections as widely as possible on and off site.
- Develop community-based initiatives using shared reading and creative writing.
- Establish strong, sustainable community partnerships to support such initiatives, extend reach and increase capacity.

- Encourage and support development and delivery by members of groups.
- Recognize diversity of participants, practitioners and audiences.
- Increase levels of participation and especially depth of engagement.
- Use print and digital technology to disseminate both community approaches and creative outcomes/work.
- Work with community partners, statutory agencies, learning organisations, policy and decision-makers to improve networks and develop better practice by engaging directly with members of groups/community participants.

B.5.3.5 Implementation mechanism

- Facilitate community-based sessions and publication.
- Disseminate learning/outcomes.
- Develop links with other communities with shared interests.

B.5.4 Second case study: Penrith

B.5.4.1 General

Dementia is a major global health issue. Research and practice shows that social engagement and creative activity plays a positive role in helping people live well with dementia for as long as possible.

B.5.4.2 Town description

Penrith is the administrative centre for Eden District Council, Cumbria, in the north-west of England. It has a population of 52 564 (2011 Census) and covers an area of 2 156 km². It is in terms of the geographical area the 8th largest district in England with the lowest population density in England/Wales.

“In the Moment” groups are run by the Alzheimer’s Society in the north and south of the county with the Wordsworth Trust facilitating regular poetry and art sessions together with creative practitioners funded by the Trust. The sessions are held in readily accessible community venues and are open to older people living with dementia, their friends and families. The sessions are highly responsive to the mood of the members of the group on any given day. Artwork (produced by all the participants and inspired by the writings of the Wordsworths and supported visits to Dove Cottage) has travelled the county, featuring at dementia forums, health and well-being events and dementia awareness days. The Trust has exhibited the work in their community gallery and these “In the Moment” displays have proved highly popular, thought provoking and inspirational to health and social care professionals, creative practitioners and the wider audience of visitors to the museum. The work of the groups has been enriched by links with other heritage partners through the Cumbria Museum Consortium, Cumbria Cultural Dementia Partnership and the regional museums network.

B.5.4.3 What has been done

- Background analysis: 46,8 million people are living with dementia, figures estimated to double every 20 years, with much of this increase in developing countries (Dementia Statistics, Alzheimer’s Dementia International, 2015). 850k people are living with dementia in the UK, with the figure set to rise to over 1 million by 2025. The UK Government published its Living Well With Dementia strategy in 2009 and in 2012 launched its Dementia Challenge. Cumbria County Council coordinates the county’s strategic Dementia Group.

B.5.4.4 Targets and indicators

- Targets: to develop and share dementia-friendly approaches; to raise awareness and deepen understanding of dementia and the sense of identity, capacity and continued agency of people living with dementia; to help people to live well with dementia by maintaining lifelong interests in poetry and the arts, developing new interests, social connections and friendships; and to support family relationships and friendship groups by sharing cultural engagement in community settings close to home.
- Indicators to be established with reference to ISO.

B.5.4.5 Good lessons to share

Measures:

- Use Wordsworth Trust collections, expertise and resources together with those of the wider heritage sector and creative practitioners to promote and sustain cultural engagement.
- Work with existing and emerging dementia networks, professional organisations, health and social care agencies and community partners to ensure access for all to cultural resources.
- Develop innovative approaches to support continued engagement of people living with dementia in social and cultural networks in familiar settings close to home.
- Work with creative practitioners to help people living with dementia to maintain a sense of identity and to maintain/develop skills, interests and social connections.
- Promote wider awareness of dementia as something which impacts everyone and all communities.
- Promote a better understanding of the individuality and capacity of people living with dementia.
- Share good practice and opportunities for cultural engagement regionally, nationally and internationally.
- Exploit digital/assistive technology to promote cultural offers from the heritage sector and to share community outreach and engagement approaches more widely.

Implementation mechanisms:

- Establish dementia-friendly approaches to helping people live well with dementia.
- Ensure people living with dementia and those who care for them are given every support to engage in developing, delivering and evaluating activities.
- Explore innovative ways of connecting people, partners and collections.
- Connect with cultural innovations in dementia work in other geographic areas and with all ages.

In both samples, further lessons to share include:

- involving participants;
- recognizing and celebrating achievements;
- acknowledging and learning from the reciprocal process of engagement;
- sharing outcomes and creative outputs as well as good practice.

Measures:

- participation levels, observation, evaluation and feedback;
- creative outputs;

- community responses;
- take-up by community partners.

Implementation mechanisms:

- setting up community engagement models and promoting quality assurance;
- collaborating with heritage/community sectors to develop, evaluate and extend creative approaches to work with people living with life-limiting/restricting conditions.

B.6 Case study — Sino-Singapore Tianjin Eco-city evaluation implementation



B.6.1 City profile



Sino Singapore Tianjin Eco-city (SSTEC) is a strategic governmental cooperation project between China and Singapore. It has been under construction since 2008 on a site that formerly comprised salt pans, barren land and polluted water bodies. As of 2017, ecological restoration of the salt pans has been accomplished, and the completed area accommodates about 70 000 people. The GDP in 2016 was 18 billion RMB compared with zero for 2008, and over 4 000 companies have been set up locally. The city has received several prestigious awards including the “Green World City” from the Global Forum on Human Settlements. It is the first National Green Development Demonstrative Area in China. In 2017, SSTEC committed to pilot ISO 37101 and all the other standards of ISO/TC 268.

B.6.2 Why was the city chosen?

From the beginning, 22 quantitative and four qualitative KPIs were chosen to guide the construction and development of SSTEC. A comprehensive evaluation for KPIs is carried out every year, providing valuable reference material for future improvement.

B.6.3 Benefits

Several organizations have been established to audit and monitor the building performance:

- Tianjin Eco-city Green Building Research Institute: responsible for auditing the green buildings in SSTEC via technical review and evaluation covering the whole process (design, construction and operation);
- Tianjin Eco-city Operation and Maintenance Centre: an integrated monitoring centre on infrastructure to collect data from 16 fields, including energy, transportation, water supply, gas and

waste generation. This centre also monitors the operation of facilities to ensure timely repairs, and collects public feedback via phones and apps.

Since 2009, the SSTECH has become more attractive and friendlier:

- 5 000 000 visitors to SSTECH in 2016;
- number of days of superior air quality 10 % higher than in most of Tianjin and Beijing;
- water quality improved from V minus level in 2009 to IV level in 2016 (in the national standard for China, level V is the worst);
- a press conference is held every month to announce policy information;
- social infrastructure (e.g. schools, hospitals, recreation facilities) is located within 400 meters of every community;
- 100 % green buildings for all the 8 million m² of on-site buildings.

B.6.4 What has been done?

Planning and target setting:

SSTECH aims to be a thriving city which is social-harmoniously, environment-friendly and resource efficient, i.e. a model for sustainable development. To realize the vision, 22 quantitative KPIs were selected, including green travelling rate > 90 %, green-space coverage > 50 %, and utilization rate of renewable energy > 20 %.

Interventions:

- annual evaluation report to present the accomplished tasks listed in the action plan;
- annual indicator system evaluation to present the value of all KPIs;
- annual statistical report on the economy and social development which presents the general economic situation, including GDP, investment and the number of the companies;
- environmental evaluation is carried out through specific stations for monitoring air quality, water quality and noise in real time.

Enhancement:

In 2017, with 80 % KPIs having been fulfilled, SSTECH decided to review and enhance the existing KPIs. A survey was carried out in all departments to define concerns. There was a full research review of the indicator values from relevant standards, such as ISO 37120, ISO 37101, and China's national standards. A new set of KPIs was devised and indicator decompositions rewritten to guide the new process.

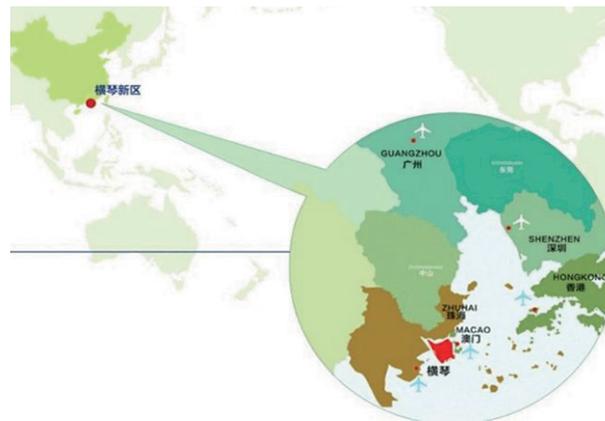
B.6.5 Good lessons to share

- public participation platforms to collect residents' feedback through "ECO-Dreamers" website, satisfaction surveys, undertaken, for example, by the Bureau for Letters and Calls;
- setting indicator values based on best practice and relevant international and national standards.
- establishing a set of standard systems covering green buildings, parks, roads and stations to fit SSTECH specifications.

B.7 Case study — Economic sustainable development in Hengqin, Zhuhai, China



B.7.1 City profile



Hengqin New Area, established in 2009, covering an area of 106,46 km², is located in Hengqin Island of Zhuhai City in south China. It is conveniently adjacent to five international airports (Hong Kong, Macao, Guangzhou, Shenzhen and Zhuhai Airport). In 2016, the GDP of Hengqin New Area reached 15,745 billion RMB, an increase of 55 times compared with 2009. Moreover, the investment in fixed assets increased by eight times, and the foreign investment increased by 759 times.

B.7.2 Why was the city chosen?

Good foundations: Hengqin is the only economic area that is both under the political will of “one island, two systems” and a free trade experimental area within China. The Hengqin government has endeavoured to preserve three ecosystems, marine, forest and wetland, and has gradually built a high-standard and advanced infrastructure system.

New model of economic sustainable development: since 2009, Hengqin government has actively pioneered a new model of economic sustainable development, including strengthening trading contacts with countries along the Maritime Silk Road and building a service platform for economic and trading cooperation with Portuguese-speaking countries together with Macao. It has made breakthroughs in fields such as financing, transportation and shipping, as well as in business, professional and R&D services, by relaxing the access restrictions on investors.

B.7.3 What has been done?

Plan and target setting: master planning for Hengqin New Area (2014–2020). Keeping cooperation, innovation and servicing in mind, Hengqin actively cooperates and integrates closely with Hong Kong and Macao. Within 10–15 years, Hengqin aims to become an “open island” connecting Hong Kong and Macao for regional co-construction, a “dynamic island” with a prosperous economy that is also suitable for living and working, a “smart island” with developed information technology, and an “ecological island” that is resource-saving and environmentally friendly.

Indicators are defined for 2020 on that basis. For example, the proportion of R&D investment in GDP amounts to 5 % per year, water consumption per 10,000 Yuan GDP drops to 33 m³, wastewater treatment to reach 100 %, green coverage (%) to reach 50 %.

Implementation mechanism:

- establish a credit restraint supervision system and improve the market order of open and fair competition;
- take the lead in promoting the third-party evaluation system in the whole country and deepen judicial credibility;
- explore a clean incentive mechanism and reform the trading mechanism of public resources;
- explore the establishment of five “innovation systems”, i.e. administrative service, market supervision, trade service, the legal system and the system for financing innovation.

Evaluation and continual improvement: the Hengqin government has established a yearly implementation plan in strict accordance with the requirements of a sustainable development management system, and has conducted annual evaluation steps according to the Master Planning for Hengqin New Area (2014–2020) and the annual implementation plan.

B.7.4 Good lessons to share

- Integrate high-level resources, gradually establish a policy framework system conforming to the development positioning of Hengqin and stimulate the vitality of economic sustainable development;
- follow an institutional and systemic innovation route unique for Hengqin that integrates the essences of systems of mainland China and the development characteristics of Hong Kong and Macao, initiate innovations in the systems for the administrative service, market supervision and trade service, and in the legal and financing systems, and improve the commercial environment in Hengqin;
- implement the “innovation-driven” strategy, concentrate on developing tertiary service industries such as tourism, leisure and health, business and financial services, culture, science and education, and new technology.

B.8 Case study — “Reve de scenes urbaines”, Plaine Commune, France



B.8.1 City description

The project concerns a partnership between the association “Dreams of Urban Scenes” [Rêve de Scènes Urbaines (RSU)] and Plaine Commune. Plaine Commune is a territory located in the northern part of the metropole of Greater Paris. It encompasses 400 000 inhabitants across nine towns.

Since 1990 there have been extensive urban rehabilitation programmes for the renewal of Plaine Commune territory. Through the development of new districts and conversion and renovation of old industrial wastelands more than 40 % of the territory is today undergoing radical transformation.

B.8.2 Project introduction

On the initiative of a group of economic partners the local government decided to set up the RSU partnership association. The association brings together companies, research and higher education institutions, start-ups and other organisations. Its objective is to secure innovative projects which contribute to the sustainable urban development of the territory. The association proposes ideas for innovative projects to the local government which then selects those to support.

The partners involved with each selected proposal carry out a feasibility study and analyse the likely contribution to the sustainable development of the territory. On the basis of these studies, the public

authority gives its agreement to the implementation of the experimental projects by the interested parties.

The RSU association has decided to experiment with ISO 37101 as a means to optimize its organization and its dialogue with all project partners, including local government.

B.8.3 Application scope of ISO 37101

The operation of RSU association in the context of its partnership with Plaine Commune.

B.8.4 What has been done?

As part of the experimental use of ISO 37101, a baseline review has been undertaken in order to formalize the mapping of the partnership constraints.

This baseline review has been created from the following documents:

- specifications of the project;
- conditions of the partnership with the local government.

It has enabled:

- identification of the field of action of the association, according to the purposes and the areas of action specified by the standard;
- development of an initial assessment method for ideas and the projects subsequently developed in the context of the partnership;
- definition of a first action plan.

The action plan incorporates installation of a steering group with Plaine Commune elected members.

B.8.5 Creation of a tool, accelerating collaborative territorial innovation

The main objectives are to:

- develop a collaborative tool;
- ensure the traceability of all the information produced and used within the framework of the pilot projects;
- assist the showroom function, in order to present the territory and the pilot projects from a cartographic interface (3D);
- manage the interfaces with the projects specifically developed in the scope of the pilot projects and presenting a numerical aspect (e.g. BIM, GIS territorial, data platform, numerical simulation, 3D virtual reality);
- create a website for the general public/external communication.

B.8.6 Development of the association's foresight committee

The collaborative approach adopted in this project provides the possibility for other territories to join and establish a partnership network.

The purpose is to allow them to benefit from feedback from the innovative projects carried out on Plaine Commune and to monitor urban innovation. They will also be able to integrate their local systems for supporting innovation into the process (for example, by offering innovative projects to Plaine Commune). Some ideas not selected by Plaine Commune may be trialled or assessed in other cities, if they wish to do this.

B.8.7 Establishment of the foreseeing committee of the association

A foresight committee composed of institutional members and experts will enable the association to benefit from the advice and the independent experience of third parties. The committee has two working groups, “urban industry” and “financial innovation in the urban projects”.

B.8.8 Good lessons to share

- The application of ISO 37101 has enabled an inventory of the way the association functions to be drawn up and the establishment of a continuous improvement process. In particular, the purposes and areas of action for sustainable development specified in the standard provide the basis for a project assessment method. The standard also constitutes a tool to formalize the communication among the different stakeholders of the project.
- The flexible framework of the standard has enabled its testing while the project was in progress.
- This common framework enables improvement of relationships between partners but it requires dedicated working teams to ensure the success of the process.
- The table describing the purposes and areas of action allows a thorough analysis of the process, but its application in practice requires important work to be fully understood and usable.

B.9 Case study: City of Hannover — Protecting biodiversity in a structured and effective way



B.9.1 City description

Hannover on the River Leine is the capital and largest city of the German state of Lower Saxony. The city of 204 km² has 518 000 inhabitants and is well known worldwide because of its commercial trade fairs such as the Hannover Fair and the CeBIT.

B.9.2 Why was this city selected?

Hannover is an active member of the German Association “Municipalities for Biodiversity”. Since 2009, the efforts to protect biodiversity (as a basis for the essential ecosystem services needed by the city) have been set out in a programme called “Experience diversity. Create diversity: More nature in the city”. The programme covers various fields of action related to biodiversity and defines 20 concrete projects. The main objective is the protection and restoration of biological diversity and with this the increase of quality of life in the city. Fields of action are:

- improvement of biodiversity;
- inspiration of people with regard to nature;
- citizen engagement for the protection of biodiversity.

By considering biodiversity in planning, maintenance and communication, the City of Hannover is a positive example of how to integrate biodiversity and ecosystem services into sustainability management.

B.9.3 Key achievements

- Integration of biodiversity protection into all planning activities of the city: urban planning and development of green areas, land-use planning (especially agricultural and forestry) and management of private and public land;
- improved protection of rare and protected species of fauna and flora;
- successful reduction of invasive alien species (neophytes);
- nature-oriented design and management of green areas;
- increased awareness and knowledge of citizens.

B.9.4 What is being done?

- Knowing the current situation (baseline): updated inventory of natural and semi-natural habitats and fauna and flora, considering not only protected habitats and species but also biodiversity characteristics for the region. Mapping of habitats and species.
- Elaboration of concepts for the restoration and appropriate management of natural and semi-natural habitats and species. For all important habitats, management maps have been created.
- Implementation of a programme for the protection of rare and protected species in the city. About 75 endangered plant species (Red List) were identified and mapped. For those plants, special management plans are being implemented by the nature protection administration and private environmental organisations. Monitoring of the development of the populations is taking place. Newly detected protected species are regularly included in the programme.
- Implementation of a programme for the protection of rare and protected animals: as a complete inventory of wild fauna would be too expensive, representative animal species of the most valuable habitats in the city have been recorded. Most of these are key indicator species and the development of their populations represents the development of biodiversity in general. The presence of such key indicator species during planning leads to special protection obligations and restrictions on construction. For all species detected, a plan for the management of the corresponding biotopes has been elaborated. Of special importance is the development of rare and protected animal species in those areas that are excluded from development. Since 2006, the city has conducted long-term monitoring of species such as amphibians, dragonflies, bats, wild bees and several bird species.
- Besides degradation of ecosystems, overexploitation of natural resources, contamination and climate change, invasive alien species are a major driver of biodiversity loss. The city runs a programme to regularly detect and control invasive alien species in the area. For two main invasive species, actions towards their elimination are being implemented. These actions are successful but a never-ending story, and citizens continually inform the administration about new populations.
- Besides protected habitats, green areas can become important refuges for biodiversity. With the objective to create nature-oriented green areas, the City of Hannover has approved biodiversity criteria for the maintenance of green areas, such as a high variety of native plants and several steps of vegetation for hedges, autochthonous seeds to increase flowering meadows, restricted mowing which respects the needs of insects and birds, and the maintenance of buckled trees. The aims for the next years are: agreement of ecological standards for all green areas; more intense training of staff; specialized maintenance plans for all green areas according to local needs; and awareness-raising to increase the understanding of citizens.
- Within a programme for aquatic ecosystems, the city has created 20 new ponds for amphibians, dragonflies and other water-related fauna. Some of these ponds serve as retention basins for rainwater; others have an additional recreational value. As in the other programmes, a monitoring system to evaluate the success of these newly created habitats is in place.
- 21 water bodies are benefitting from the programme to protect and restore rivers and creeks. Up to now, about 20 km of river beds have been restored and buffer zones have been created along the

shoreline. Management strategies have been developed for all water bodies. Since 2015, there has been a focus on improvement of water quality as well as the overall structure of waterways.

- The City of Hannover rents agricultural land and forests to private tenants. To protect and improve biodiversity in pasture land, the city includes specific requirements in its contracts with farmers and forest managers. Furthermore, Hannover buys valuable land and converts it into biodiverse pasture land. Up to now some 390 ha of pasture land has been created. It is not permitted to use pesticides or fertilizers on these pastures and elsewhere they can only be used outside the flowering period and nesting periods of meadow birds. In addition, specific criteria have been approved for the management of the 1 400 ha of city forest. All city forest is FSC-certified and the management requirements specify that at least 10 % of the forest will be left for succession rather than being available for economic use. They also prohibit clear cutting and the use of pesticides, and require reforestation with a variety of native species and a high share of deadwood in the forest.
- Landscape protection and recreation are the main objectives of the green belt around the urban areas of Hannover. More than 80 km of cycle paths have been created.
- The combination of nature with recreational use, cultural activities or historical background helps to attract the attention of citizens and to raise awareness of the importance of biodiversity. Additionally, the city organizes exhibitions explaining “nature in the city”, publishes brochures and, together with NGOs, offers a variety of activities to experience nature. One of the most successful is the “Kinderwald Hannover” – the “children’s forest” where children can play and participate in research activities. A School Biology Centre where children learn about ecosystems of the region, the diversity of species and genetic diversity has been created on a 15 ha site.

Annex C (informative)

Example of the application of the ISO 37101 cross-analysis matrix

Use of the cross-analysis matrix by French government bodies to specify calls for proposals relating to projects contributing to the sustainable development of a territory.

This example illustrates the first stage of use of the standard, the strategy definition grid, to implement the strategic ambition of a political authority. The political authority examines, with stakeholders, various questions to clarify priority objectives relevant to the scheme, the basis for building the strategy and the action plan.

The following 12 bullet points refer to the 12 areas of action set out in ISO 37101. The letters in parentheses refer to the six sustainable development purposes to which the public authority will contribute through its areas of action, namely attractiveness (A); well-being (W); social cohesion (SC); responsible resource use (RRU); preservation and improvement of environment (PIE); and resilience (R).

— I – Governance, empowerment and engagement

- 1) (A) Allow all stakeholders, inhabitants, visitors and economic actors to contribute to life in the territory, through adapted forms of governance.
- 2) (W) Enable, through appropriate local governance, detection and identification of the well-being aspirations of its inhabitants. Evaluate the impacts of the actions put in place and inform the stakeholders.
- 3) (SC) Implement mechanisms and modes of action that take into account constraints specific to certain deprived groups of society, allowing them to have a real involvement in decisions that concern them.
- 4) (RRU) Engage citizens as to the impact of their individual lifestyles and community services on the use of non-renewable or rare natural resources.
- 5) (PIE) Support and promote via governance systems the actors and associations most active in the preservation of the natural environment of the city, the development of biodiversity and the enhancement of urban landscapes.
- 6) (R) Build a global vision of the scheme that will take into account natural, industrial, economic, social and security risks and changes through the establishment of governance and strategic planning arrangements involving all actors.

— II – Education and capacity building

- 1) (A) Encourage the integration of all inhabitants through the education and training system. Improve the access of non-native migrants to local training.
- 2) (W) Build on training and information systems to promote the notion of public welfare and participation in community activities.
- 3) (SC) Recognize cultural diversity and take it into account in building a common vision of the future and perception of what is at stake in the city.
- 4) (RRU) Through training, information and knowledge-building foster responsible use of resources in both purchasing and consumption.
- 5) (PIE) Through the education system, raise the awareness and knowledge of young people on the preservation and restoration of the natural environment.

- 6) (R) Through training and information policies and initiatives, raise awareness and involvement of younger generations in future life conditions and risk management.

— **III – Innovation, creativity and research**

- 1) (A) Encourage and organize the expression of individual and collective creativity. Facilitate national and international recognition of local research and innovations.
- 2) (W) Involve the relevant stakeholders of the territory in the innovation and experimentation of the economic and societal actors of the territory by valuing the improvement of well-being that they provide.
- 3) (SC) Enable and encourage access to creative and innovative spaces for all sectors of society and for all areas of the territory.
- 4) (RRU) Support and promote innovations designed or managed by technical or organizational stakeholders in the local area.
- 5) (PIE) Promote innovations in building and urban planning that restore biodiversity in the territory and contribute to global environmental management.
- 6) (R) Encourage foresight and innovations that address the consequences of climate change and adaptation to it.

— **IV – Health and care in the community**

- 1) (A) Provide healthcare services for local residents and access to healthcare for all short- or long-term visitors.
- 2) (W) Establish health systems which are accessible to all and which take into account the social and cultural differences of users.
- 3) (SC) Facilitate and encourage the actions of citizens and associations to support populations at risk of marginalization or those already marginalized.
- 4) (RRU) Promote the use of low health risk.
- 5) (PIE) Establish and evaluate policies that improve the quality of air, water and soil.
- 6) (R) implement specific policies for the prevention of major health risks identified by the community.

— **V – Culture and community identity**

- 1) (A) Preserve and develop a sense of community identity and belonging.
- 2) (W) Ensure that all residents have possibilities to express their individual identity.
- 3) (SC) Set up collective cultural events accessible to all, including events involving marginalized populations.
- 4) (RRU) Encourage the responsible use of resources based on traditions, culture and common identity of the territory.
- 5) (PIE) Rely on the protection of the environment and nature in the construction of a collective culture adapted to the natural characteristics of the territory.
- 6) (R) Anticipate changes in culture and identity related to transformations and risks and develop specific adaptation policies.

— **VI – Living together, interdependence and mutuality**

- 1) (A) Put in place specific policies that facilitate social and intergenerational inclusion.

- 2) (W) Promote urban and architectural quality as an essential part of quality of life and collective identity.
- 3) (SC) Encourage private solidarity actions with populations which are economically or culturally marginalized.
- 4) (RRU) Strengthen activities enabling exchanges and proximity relations through the collaborative economy.
- 5) (PIE) Encourage intergenerational and intercultural exchanges during conservation and restoration programs.
- 6) (R) In the face of climate change and other risks put in place specific solidarity instruments for the most vulnerable populations.

— **VII - Economy and sustainable production and consumption**

- 1) (A) Create private-sector investment and start-up conditions to maintain a wide range of job opportunities.
- 2) (W) Promote well-being in housing and at work through innovations offering new services, particularly by using information and communication technology.
- 3) (SC) Promote jobs adapted to marginalized populations or those facing special difficulties, particularly by developing the solidarity economy.
- 4) (RRU) Involve public and private enterprises in the development of the circular economy in urban services.
- 5) (PIE) Encourage fair local trade through public policies and regulations applying to private bodies.
- 6) (R) Reduce the community's dependence on proven risks of all kinds, including foreseeable natural disasters, and ensure financial capabilities to cope with them.

— **VIII - Living and working environment**

- 1) (A) Adapt the response to diverse housing needs and facilitate the fluidity of residential and professional paths.
- 2) (W) Evaluate and promote the positive effects of a better quality of life on welfare.
- 3) (SC) Allow access to decent housing for all.
- 4) (RRU) Give priority to the use of renewable resources in procurement and consumption by communities and businesses.
- 5) (PIE) Take environmental issues into account in plans and programs relating to the planning and implementation of public policies, in particular by promoting compact urban growth that limits land take and fragmentation.
- 6) (R) Take risks into account with measures to preserve the environment and quality of life.

— **IX - Safety and security**

- 1) (A) Ensure a safe territory for its inhabitants and visitors.
- 2) (W) Take issues of safety and security into account in the design and management of public spaces.
- 3) (SC) Develop a specific action on security and crime prevention for all categories of the population, especially the most threatened persons (children, women, economically weak populations).

- 4) (RRU) Ensure continuity of resources required to support economic activities and to meet the needs of the community.
- 5) (PIE) Establish specific policies for scarce or threatened environmental resources within the community, taking into account the principles of avoidance, reduction and offsetting of damage.
- 6) (R) Take natural and technological risks into account in the allocation of land use.

— **X - Community infrastructures**

- 1) (A) Ensure the performance and accessibility of community services and facilities.
- 2) (W) Improve and measure the quality of basic services (water, energy, waste, sanitation) offered to users thanks to information and communication technology.
- 3) (SC) Ensure a minimum level of service provided by basic infrastructure accessible to all.
- 4) (RRU) Establish infrastructures by developing a circular economy approach, in particular by reducing the use of non-renewable raw materials.
- 5) (PIE) Reduce the environmental impact of public or private infrastructures which provide collective services.
- 6) (R) Take into account the need for continuity of basic public services in the event of a crisis, including digital risks or major disasters.

— **XI - Mobility**

- 1) (A) Invest in mobility improvement to foster economic, cultural and social exchanges within and outside of the community.
- 2) (W) Provide multiple mobility services ensuring freedom of choice for users and giving priority to active mobility.
- 3) (SC) Use mobility as a means for fostering social cohesion and sharing among different communities.
- 4) (RRU) Promote the services offered by biodiversity and ecosystem services and develop them in a sustainable way.
- 5) (PIE) Evaluate and promote the impact of measures taken to reduce the environmental impact of different means of mobility.
- 6) (R) Develop plans and programs to maintain mobility and to take into account the effects of global warming in the design and implementation of new infrastructure.

— **XII - Biodiversity and ecosystem services**

- 1) (A) Make biodiversity and ecosystem services a specific focus of community plans and programs.
- 2) (W) Create the conditions for citizens to appreciate biodiversity and ecosystem services as beneficial elements of their daily lives.
- 3) (SC) Rely on the broadest access of all to nature and ecosystem services as a means to strengthen citizenship and social cohesion.
- 4) (RRU) Develop the circular economy based on limiting both waste production and community landfills.
- 5) (PIE) Promote actions to restore and develop ecological continuities.

- 6) (R) Anticipate and reduce the specific ecological risks associated with global warming or natural or human-caused disasters.

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