



Technical Report

ISO/TR 37115-1

Sustainable cities and communities — Net zero carbon cities —

Part 1: Use cases

*Villes et communautés territoriales durables — Villes à zéro
émission nette —*

Partie 1: Cas d'usages

**First edition
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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 document 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*.

A list of all parts in the ISO 37115 series can be found on the ISO website.

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

Climate change is one of the most significant challenges for sustainable development. It brings uncertainty and risk for policymakers trying to help shape the future of cities. To avoid the worst effects on quality of life, biodiversity, and critical infrastructure, ambitious and accelerating action to deal with the issues of climate change exists – foremost among which is making rapid and significant reductions in greenhouse gas (GHG) emissions. In this context, the United Nations (UN) and the International Organization for Standardization (ISO) along with numerous national organizations worldwide, place great importance on addressing this aspect of climate change. In December 2015, 196 countries and regions globally signed the Paris Agreement, the first truly global agreement aimed at tackling climate change. The core goal is to limit the global average temperature increase to below 2 °C above pre-industrial levels and endeavour to limit it to 1,5 °C. The Intergovernmental Panel on Climate Change (IPCC) report, *Climate Change 2021: The Physical Science Basis*, points out that to control global warming, all countries and organizations work together to implement net zero emissions strategies.

As of October 2024, the number of countries worldwide that have put forward carbon neutrality goals has increased to 151, covering nearly 92 % of global GDP, 89 % of the global population, and an estimated 88 % of global GHG emissions. The United Nations Sustainable Development Goals (SDGs) emphasize that cities are key players in net zero. According to statistics from UN-Habitat, cities consume 78 % of the world's energy, and over 60 % of GHG emissions originate from urban areas. Reports from both the United Nations Environment Programme (UNEP) and the IPCC highlight the essential role of cities in combating climate change. Achieving sustainable cities and communities and attaining net zero emissions presents a formidable challenge. This urgently needs exploring while attaining net zero emissions solutions tailored to cities and communities, which are essential for meeting the challenges posed by climate change. Many cities have already taken actions to address their GHG emissions, such as Beijing Future Science City (BFSC), Marseille and Moscow.

ISO is developing technical standards to support industries or organizations in their climate change initiatives and to foster coordinated efforts in the global battle against climate change. For example, IWA 42 and ISO 14068-1 provide tools and guidance for policymakers and organizations to achieve net zero emissions. IWA 42 establishes a global framework to help regional, city and organizational participants in coordinating, understanding, and planning programs to achieve net zero emissions. ISO 14068-1 guides organizations on measuring, reporting and managing their GHG emissions to enhance environmental performance and combat climate change.

However, cities, which often encompass multiple sectors such as energy generation and consumption, transportation and industry, still lack International Standards for systematically reducing greenhouse gas emissions. To tackle this challenge, accurate data collection and analysis, alongside effective management practices and technological solutions, are essential. While the timing for establishing International Standards is not yet optimal, compiling best practices from various countries will offer valuable references and learning opportunities for all.

This document provides use cases that focus on policies, supportive technologies and management methods for global cities and communities to make progress towards net zero emissions goals (corresponding to IWA 42) and address climate change and global carbon neutrality goals based on consensus (corresponding to ISO 14068-1). This document takes into account varying climate and environmental conditions as well as the impact of scale, available resources and economic structures in order to analyse goals, strategies, plans and effectiveness of implementation, as well as important cross-cutting themes such as low-carbon technologies, public participation, monitoring and verification.

This document includes cases from three continents and eleven countries, highlighting the shared need among stakeholders for guidance and comprehensive management approaches. [Clause 4](#) provides a framework and ten themes that were developed through discussions with stakeholders for collecting cases. [Clause 5](#) systematically summarizes the carbon neutrality experiences and achievements of cities at various development stages across different regions, drawing on an analysis of 20 cases derived from two collection rounds and key findings summarized out of the global open webinars, which collectively cover ten themes:

- governance and regional coordination;
- local actors, partners, participants or citizenship initiatives;

- industry and sustainable production and consumption;
- energy;
- construction;
- transportation;
- agriculture, forestry, and other land uses (AFOLU);
- circularity;
- living and working environment;
- other.

[Clause 6](#) concludes with findings and recommendations to explore innovative future pathways for net zero carbon cities development. [Annex A](#) provides a brief overview of cases from open webinars and corresponding relationships between cases and ten themes.

Insights from global net zero carbon cities and stakeholder needs identified during open webinars contribute to the development of this document for net zero carbon cities. This document is intended to expand into a comprehensive series. This document presents global case studies from various regions and sets a solid foundation for the following parts of the series. ISO 37115-2 is intended to reference these case studies and use the ten themes from this document as its core framework to support the development of net zero carbon cities. Future parts of the ISO 37115 series are intended to provide guidance on urban planning, industrial zones, carbon assessment, and more, addressing the diverse concerns of stakeholders.

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Sustainable cities and communities — Net zero carbon cities —

Part 1: Use cases

1 Scope

This document provides use cases on the practices of global cities and communities, including policies, supporting techniques and tools, and management approaches that drive towards achieving lower greenhouse gas (GHG) emissions for cities and communities as a key step towards net zero carbon cities in response to climate change and global carbon neutrality.

This document takes into account varying contexts including climate conditions, scale, available resources or economic structures in these practices. This document is in line with the sustainability purposes and issues provided in ISO 37101 that are relevant to GHG emissions.

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 37100, *Sustainable cities and communities — Vocabulary*

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

ISO 14068-1, *Climate change management — Transition to net zero — Part 1: Carbon neutrality*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 37100, ISO 37101, ISO 14068-1 and the following apply.

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

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

3.1

net zero

condition in which human-caused residual GHG emissions are balanced by human-led removals over a specified period and within specified boundaries

Note 1 to entry: Human-led removals include ecosystem restoration, direct air carbon capture and storage, reforestation and afforestation, enhanced weathering, biochar and other effective methods.

Note 2 to entry: The words “human-caused” and “human-led” are intended to be understood as synonymous with the word “anthropogenic” in IPCC definitions.

[SOURCE: IWA 42:2022, 3.1.1]

3.2
life cycle management
LCM

set of systematic and coordinated activities and practices through which a structure is appropriately managed over its life cycle

[SOURCE: ISO 22040-2:2024, 3.2]

3.3
low-emissions zone

geographically defined area that seeks to restrict or deter access by specific categories of high-polluting vehicles to improve the air quality within the geographic area

Note 1 to entry: The low-emissions zone can be dynamic, allowing the operating entity to change the location, boundaries, or time of the low-emissions zone.

[SOURCE: ISO/TS 19091:2019, 3.27]

4 Framework for case studies

4.1 General

This clause provides a precise analysis of terminology and definitions of relevant documents from international organizations and sources of urban greenhouse gas emissions (see 4.2), clearly distinguishing between terms such as "net zero" and "carbon neutrality" (see 4.3). Additionally, it offers ten themes that determine the framework of case studies to guide the efforts of urban GHG emission reductions (see 4.4).

4.2 Sectors committed major contributions to urban GHG emission

GHG refers to gaseous components in the atmosphere that can both absorb and re-emit infrared radiation, including those that are naturally occurring and man-made. The sources of GHG refer to any process or activity that causes GHG, aerosols, or precursors, to be released into the atmosphere. Sources can be divided into two major categories: anthropogenic and natural. This document primarily focuses on a detailed analysis of anthropogenic sources.

Anthropogenic sources of GHG include:

- fossil fuel combustion;
- land-use change and forestry;
- livestock and agricultural practices;
- waste management;
- industrial processes.

The IPCC, in its "Climate Change 2023 Synthesis Report" categorizes GHG sources primarily by sector, for example, energy, industrial, agriculture, forestry, other land-use sectors, transportation and construction.

International Energy Agency (IEA) publication Net Zero by 2050 demonstrates that achieving net zero emissions demand rapid, large-scale deployment of all available clean energy technologies, including renewables, electric vehicles, and energy-efficient building retrofits, by 2030.

The UN Environment Programme's Emissions Gap Report 2023 highlights that "Energy (generation) is the dominant source of GHG emissions, currently accounting for 86 % of global CO₂ emissions. The coal, oil and gas extracted over the lifetime of producing and under-construction mines and fields as of 2018 would emit more than 3,5 × the carbon budget available to limit warming to 1,5 °C, with a 50 % probability, and almost the size of the budget available for 2 °C, with a 67 % probability. Global transformation of energy systems is thus essential, including in low- and middle-income countries, where pressing development objectives were met alongside a transition away from fossil fuels."

UNEP Emissions Gap Report 2023 juxtaposes CO₂ emissions from existing fossil fuel infrastructure against carbon budgets for the Paris Agreement's 1,5 °C (50 % likelihood) and 2 °C (67 % likelihood) long-term temperature goals.

Although the GHG emissions information from different countries has unique characteristics, data from regional organizations such as China's Ministry of Ecology and Environment (MEE), the European Environment Agency (EEA), and the U.S. Environmental Protection Agency (EPA) show that energy and industrial activities are the primary sources of global GHG emissions. In China, GHG emissions mainly stem from energy and industrial activities. According to the Second Biennial Update Report on Climate Change of the People's Republic of China, energy activities are the main source of China's GHG emissions, accounting for about 86,8 % of the total CO₂ emissions. The EEA's European Environment — State and Outlook 2021 categorize GHG emission sources as follows: energy supply, industrial processes, agriculture, waste management, transportation, and other sectors. The EPA's Inventory of U.S. GHG Emissions and Sinks 2022 classifies GHG emission sources as follows: energy-related sources, industrial sources, agriculture, land use change and forestry, waste management, and other sectors. IWA 42 primarily focuses its attention on the emissions of GHG within the domains of forestry, land use, agriculture, electricity generation, cement production, steel manufacturing, service buildings and residential structures.

In summary, research reports by international organizations highlight distinct sector characteristics in global GHG emissions. These emissions are mainly concentrated in the energy, industry, transportation, construction and waste management sectors.

4.3 Examining “net zero” and “carbon neutrality”

There are some terms in the field of GHG emission reductions, such as "net zero" and “carbon neutrality,” that can potentially be conflated. IWA 42 provides tools for policymakers and those committed to achieving net zero emissions for their enterprises, groups or countries, while ISO 14068-1 offers a relatively standardized pathway to achieving carbon neutrality, guiding organizations, products and services (including events and buildings) to achieve carbon neutrality through quantifying, reducing and offsetting GHG emissions.

IWA 42 defines "net zero" as a condition in which human-caused residual GHG emissions are balanced by human-led removals over a specified period and within specified boundaries. Human-led removals include ecosystem restoration, direct air carbon capture and storage, reforestation and afforestation, enhanced weathering, biochar and other effective methods.

ISO 14068-1 defines "carbon neutrality" as a state of being carbon neutral. The IPCC distinguishes between carbon neutrality, a condition in which CO₂ emissions are balanced by CO₂ removals, and GHG neutrality, in which all GHG emissions are balanced by GHG removals.

Although these two terms differ in their focus, both aim to promote the reduction of GHG emissions. Overall, the "net zero" definition in IWA 42 provides a more comprehensive and integrated concept, focusing not only on CO₂ removal but all GHG removal and focusing on human-led removals, applying to the entire supply chain. Meanwhile, "carbon neutrality" in ISO 14068-1 is more focused on balancing CO₂, although its definition aligns with comprehensive GHG neutrality.

This document provides use cases focusing on achieving net zero emissions for cities and communities as a key step toward net zero carbon cities in response to climate change and the need for global carbon neutrality.

4.4 Elaboration of ten themes contributing to net-zero

This clause identifies ten themes to organize and collect use cases for pathways toward net zero carbon cities. These themes align with the six objectives and twelve sustainability issues provided in ISO 37101. Through these themes, this document gathers use cases to provide practical strategies and references for cities aiming to achieve the goal of net zero emissions.

By referring to [4.2](#) as well as standards such as ISO/TS 14092, ISO 14064-1, ISO 14068-1 and IWA 42, primary sources of GHG emissions are identified across all key sectors: energy, industry, agriculture, forestry, land use, transportation and construction. These GHG emission sources are incorporated into the ten themes for

two rounds of case collection. Each theme provides use cases with targeted reduction practices, practical experiences, and possible lessons to share with cities.

The ten themes are:

- Theme 1: Governance and regional coordination: This theme encompasses government commitments to achieving net zero carbon cities through regional collaboration and governance improvements. Strategies include regional and local planning, policy and regulatory development, target and indicator setting, implementation schemes, oversight and assessment, evaluation and periodic adjustments, and community engagement. Additionally, it involves communication and fostering cultural awareness.
- Theme 2: Local actors, partners, participants or citizenship initiatives: This theme encompasses strategies for local governments, community organizations, and stakeholders to achieve net zero carbon cities. It emphasizes collaboration, community engagement, education, and environmental stewardship. In essence, it underscores the importance of fostering robust collaborative partnerships between localities and cooperative entities to collaboratively identify and tackle the underlying factors contributing to the reduction of GHG emissions. This endeavour necessitates extensive engagement from the community and the public, the establishment of cooperative governance frameworks, the enhancement of civic environmental education, the encouragement of volunteer initiatives, the nurturing of social innovation and the reinforcement of local environmental stewardship.
- Theme 3: Industry and sustainable production and consumption: This theme encompasses strategies in the industrial sector to promote sustainable production and consumption for net zero carbon cities. Key measures include technological innovation, energy efficiency and sustainable consumption patterns. These strategies encompass technological innovation, widespread application of energy-saving equipment, dual optimization of energy structure and production processes, as well as advocating and practicing the optimization and upgrading of consumption patterns, with the aim of effectively reducing dependence on high energy-consuming products.
- Theme 4: Energy: This theme encompasses GHG emission reductions in the energy sector. It involves phasing out high-carbon energy, improving energy efficiency, and promoting renewable energy and digitalization technologies. By developing renewable energy and improving energy efficiency, it aims to reduce GHG emissions. This includes energy efficiency, solar energy, wind or geothermal energy, electricity, renewable energy utilization, energy digitalization, clean electricity and energy diversification.
- Theme 5: Construction: This theme encompasses GHG emission reductions in construction through green building practices, upgrading existing structures, and using sustainable materials. It includes planning, design and infrastructure improvements. By using low-carbon building materials and energy-saving designs, it directly participates in GHG emission reductions and helps reduce GHG sources in the construction sector. This includes planning and design, operation and infrastructure.

NOTE Countries and regions define green buildings differently. This document collects several examples below to aid in understanding the concept.

United States The U.S. Environmental Protection Agency (EPA) considers green buildings as practices that are environmentally responsible and resource-efficient throughout a building's entire life cycle, from site selection, design, construction, operation, maintenance, renovation to demolition. This practice expands and complements the considerations of economy, practicality, durability, and comfort in traditional architectural design.

China China's Green Building Evaluation Standard (GB/T 50378) clearly stipulates that green buildings refer to buildings that maximize resource conservation (energy conservation, land conservation, water conservation, and material conservation), protect the environment, reduce pollution throughout their life cycle, provide healthy, applicable, and efficient living spaces, and coexist harmoniously with nature.

UK The British Building Research Establishment (BRE) developed the BREEAM in 1990. Although it does not explicitly define green buildings, it evaluates the environmental performance of buildings throughout their life cycle. According to the comprehensive score, buildings are divided into four levels: Pass, Good, Very Good and Excellent.

Europe The European Union does not have a unified definition of green buildings, but the Energy Performance of Buildings Directive (EPBD) stipulates that all new buildings in the EU were "nearly - zero energy buildings" from 2020. A net zero emission building means that the building has a very high energy performance level, extremely low energy consumption, and all energy comes from renewable energy sources, with no GHG emissions from fossil fuels.

- Theme 6: Transportation: This theme encompasses reducing urban GHG emissions in urban transportation by promoting low-emission vehicles, optimizing logistics and enhancing public transport. It emphasizes energy efficiency and reducing fossil fuel dependence. This includes public transportation, electric and hybrid vehicles, infrastructure development and mobility.
- Theme 7: Agriculture, forestry and other land uses: This theme encompasses reducing urban GHG emissions and increasing urban carbon sinks through sustainable agricultural practices such as crop rotation and cover cropping, and through the protection and restoration of forests, wetlands and other ecosystems. It includes precision agriculture, forest management and ecological agriculture.
- Theme 8: Circularity: This theme encompasses reducing waste and emissions while improving resource efficiency through reducing, reusing and recycling materials. It emphasizes that practicing a circular economy helps to reduce the demand for new resources, thereby reducing emissions from extraction and production processes, thus affecting GHG sources. This includes resource recycling, waste reduction and product life cycle management (LCM).
- Theme 9: Living and working environment: This theme encompasses enhancing the quality of living and working environments through improved planning, design and operation of urban areas, including public spaces, clean air, water resource management and urban greening. It emphasizes that a good living and working environment can improve the quality of life for residents while reducing energy consumption and resource waste, positively impacting GHG sources. This includes citizen lifestyle, sustainable consumption, lifestyle transformation and sustainable communities.
- Theme 10: Other: This theme encompasses areas such as technological innovation, education and training, public participation, and raising awareness, supporting and supplementing the other themes. It emphasizes that technological innovation can bring new reduction technologies and methods, education and training can help raise public awareness of climate change, and public participation and raising awareness can promote social support and participation in reduction actions. This includes technological innovation, financial mechanisms, market incentives, international cooperation and policy coordination.

These themes are developed based on a comprehensive understanding of GHG sources and reduction measures, collecting global cases to recognize worldwide experiences in combating global warming, protecting ecosystems and ensuring the long-term prosperity of human society.

5 Case studies

5.1 General

This clause presents 20 cases derived from two collection rounds, with each case including overview, benefits and objectives, measures and methods, technology or management innovation, lessons learned. Additionally, key findings from global open webinars (see [Annex A](#)) are also summarized in this clause.

5.2 Governance and regional coordination

5.2.1 Beijing Future Science City (China): Practices for reduction and management of GHG emissions in "Energy Valley"

5.2.1.1 Overview

BFSC is a hub for Beijing's efforts to establish a globally influential national science and technology innovation centre, located in northern Beijing. The 'Energy Valley' covers 10 squares kilometres in the eastern section of BFSC, designed to accommodate around 100 000 residents. Development began in 2009.

The Energy Valley is one of the first green ecological demonstration zones in Beijing and serves as a pilot city for ISO 37101. From the beginning, BFSC has actively implemented national climate change strategies, focusing on "low-carbon" development principles.

BFSC serves as a model for China and an important strategic initiative for Beijing in its efforts to achieve the China's 'Dual Carbon Goals,' aiming for carbon peaking by 2030 and carbon neutrality by 2060. By the end of

2023, approximately 4,4 million m² of green buildings had been constructed within the Energy Valley, which also hosts the country's first 'carbon-neutral theme park.' Nearly all energy technology companies in BFSC are adopting low-carbon technologies, such as the national power investment corporation's net zero carbon energy park, which showcases a smart, net-zero carbon power plant. By 2020, substantial reductions in GHG emissions were achieved.

5.2.1.2 Benefits and objectives

a) Economic benefits:

- 1) Facilitating the development of advanced energy industries: The Energy Valley fosters economic growth by attracting over 300 high-tech energy enterprises, driving innovation in Beijing's energy sector.
- 2) Improving energy utilization efficiency and reducing costs: Significant resource conservation and reduced energy consumption have been achieved through initiatives like energy-saving lighting and renewable energy generation technologies.

b) Social benefits:

- 1) Attracting businesses and talent to the region, enhancing residents' well-being: Hundreds of enterprises from various sectors have been attracted to BFSC, employing tens of thousands of talented professionals.
- 2) Elevating the brand influence of BFSC: As one of the first green ecological demonstration zones in Beijing and as the pilot city for ISO 37101, BFSC enhances community well-being by attracting talent and promoting environmental awareness.
- 3) Increasing public awareness of environmental protection: The establishment of a "carbon-neutral theme park" has encouraged active participation from citizens and tourists, with over 660 000 visitors recorded to date.

c) Environmental benefits:

- 1) Reducing GHG emissions and promoting carbon sequestration: In 2020, through initiatives such as distributed photovoltaics and wind power, organizations in the Energy Valley reduced GHG emissions by over 8 000 tons.
- 2) Improving the quality of air, water and soil in the region: This was accomplished by creating a 314-hectare waterfront park and establishing a green ecological corridor along the Wenyu River. As a result, green coverage reached an impressive 84 %, and the water quality in the river significantly improved.

5.2.1.3 Measures and methods

a) Emphasizing navigation by indicators and standards:

BFSC has established a comprehensive green and low-carbon indicator framework to guide GHG emission reduction, involving a top-level design and the establishment of a green and low-carbon indicator framework with 42 indicators, along with a green and low-carbon implementation scheme and a series of specific plans.

This framework includes specific low-carbon indicators, such as tons of GHG emissions (CO₂) per \$ 1 000 000 GDP is less than 110 tCO₂ per million USD and renewable energy utilization rate is greater than 20 %. According to this framework, BFSC has conducted a top-level design for green and low-carbon implementation scheme in the Energy Valley, which includes a management system guidance covering planning, construction and operations throughout the entire life cycle of projects.

NOTE Tons of GHG emissions (CO₂) per \$ 1 000 000 GDP is less than 110 tCO₂ per million USD: This means that the ratio of total carbon dioxide (CO₂) emissions from the construction, municipal, and transportation sectors within the entire BFSC area to its GDP (measured in millions of dollars) is less than 110 tons. Renewable energy utilization rate is greater than 20 %: this indicates that the proportion of renewable energy consumption in the total energy consumption within the entire BFSC area exceeds 20 %.

b) Strengthening the role of plannings:

BFSC has created low-carbon plans based on the indicator framework and its implementation scheme, aiming for low-carbon development in both master and detailed planning. In 2014, BFSC was the first industry park in China to develop a low-carbon development plan, which uses a model to assess sustainability capabilities. This plan includes a GHG emissions inventory and provides strategies, measures, and actions aimed at reducing GHG emissions.

c) Exploring management methods:

BFSC has implemented an effective management system to promote green and low-carbon practices, throughout all stages of development. Clear responsibility agreements have been established for developers and other participating entities, ensuring stricter oversight during both the construction and the operational phases. For projects undertaken by developers, ten ecological indicators have been integrated into land grant conditions. Among these, seven indicators including the certification levels of green building and energy – saving compliance rates for public buildings – are directly aligned with the goals of achieving a net zero carbon city.

d) Establishing strong organizational leadership:

The administration committee of BFSC is responsible for overseeing, coordinating, supervising and managing all activities related to green and low-carbon development. To further enhance these efforts, a sustainable development department has been established to handle the implementation of indicators, develop technical standards, conduct assessments and evaluations and organize expert workshops. The sustainable development department invite experts from various research fields to support the entire process of low-carbon development, ensuring that it is scientifically sound and aligned with the established indicators and objectives.

e) Promoting stakeholder engagement:

The administration committee of BFSC has actively engaged all stakeholders, including non-profit organizations, developers, large enterprises, small and medium-sized enterprises (SMEs), and residents within the Energy Valley, through activities such as workshops, forums and webinars. In these events, participants exchange insights on green practices and contribute to policy discussions, which are supported by flexible channels for ongoing feedback. This engagement aims to raise awareness, facilitate communication and promote the adoption of green and low-carbon technologies, ultimately to create a sustainable living and working environment.

5.2.1.4 Technology or management innovation

a) Innovating low-carbon development:

Guided by the green and low-carbon indicator framework, BFSC has developed a series of specific plans targeting different sectors. These plans aim to control GHG emissions not only in land development but also in municipal infrastructure and public spaces, ensuring that all construction in these areas complies with the established low-carbon guidelines. Key innovations include integrating green and low-carbon indicators into land grants and establishing clear responsibility agreements with developers to ensure compliance. Additionally, an assessment and review process has been established to monitor the implementation of these low-carbon indicators.

b) Benchmarking International Standards:

BFSC, as a pilot city for ISO 37101, enhances governance through compliance with ISO 37108. ISO 37108 provides guidance for the practical local implementation of ISO 37101 in business districts. This work ensures compliance with sustainable management systems in business districts and enhances the governance capacity for sustainable development.

5.2.1.5 Lessons learned

a) Emphasizing top-level design (often referred to as "strategic planning"): BFSC established an indicator framework for overall guidance, followed by specific plans for green and low-carbon development.