

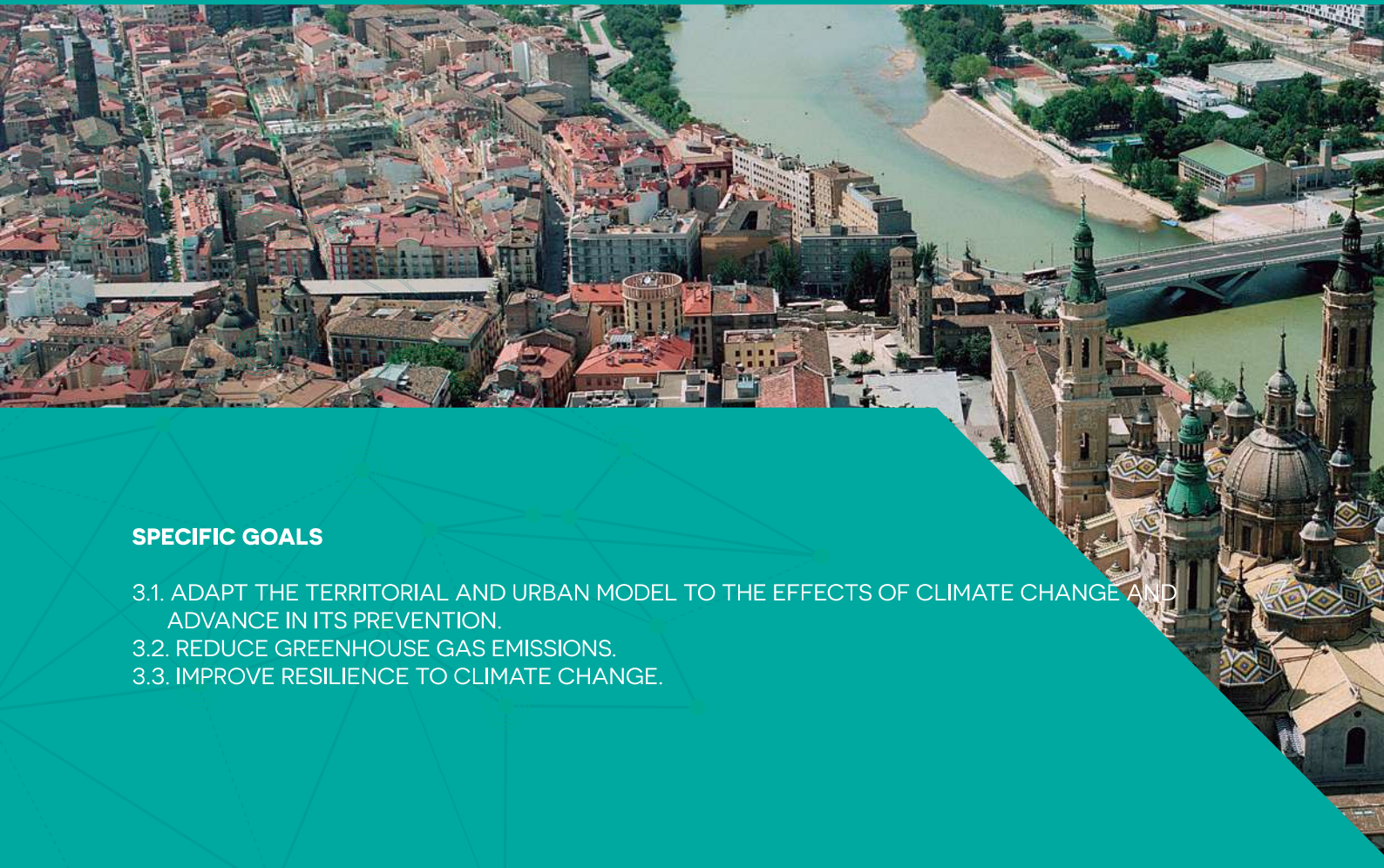
STRATEGIC
GOAL

3

PREVENTION AND REDUCTION OF CLIMATE CHANGE IMPACTS AND IMPROVEMENT OF RESILIENCE IN TOWNS AND CITIES

SPECIFIC GOALS

- 3.1. ADAPT THE TERRITORIAL AND URBAN MODEL TO THE EFFECTS OF CLIMATE CHANGE AND ADVANCE IN ITS PREVENTION.
- 3.2. REDUCE GREENHOUSE GAS EMISSIONS.
- 3.3. IMPROVE RESILIENCE TO CLIMATE CHANGE.



The warming of the climate system is unequivocal, undeniably attributable to human activity and is caused, essentially, by greenhouse gas (GHG) emissions caused by the use of fossil fuels and the change in land uses.

The increase in temperatures and its consequences, long periods of drought, flooding due to torrential rains, the loss of fertile soil, the increase in forest fires and rising sea levels, are among some of the most negative effects that are associated in Spain to climate change, and which land and urban planning must try to address preventively. Mitigating the effects of climate change is therefore seen as an obligation and an emergency, while adaptation is a necessity. Because, among other factors:

- The increased urbanisation and the reduced permeability of the ground lead to a reduced ability to absorb rainwater and an increase in the speed of water flows before they reach the sea. This reduction, together with an increase in torrential rain episodes, increases the likelihood of flooding in urban systems.
- The recurrence of extended periods of extreme drought compromises the organisation of many cities and metropolitan areas, which forces us to take measures of various kinds, some of them structural in nature. Lower rainfall coupled with a change in the rainy season and an increase in population and urban activity will cause dysfunctions of various natures if urban systems do not take appropriate measures to address the new water scenario that comes with climate change.
- Heat waves take on an added effect when connected with rising temperatures. Their immediate impact is thermal discomfort, but in extreme cases, with prolonged, high temperature periods, it can result in more illnesses and deaths. The characteristics of urban materials modify the climate of cities, making the temperature in these areas several degrees higher than in rural areas. The combination of heat waves with this heat island effect increases the impact on the health of citizens.
- The increase in temperature is often accompanied by the transmission of food-borne diseases. Today, urban areas are home to the majority of the world's population. "They" are responsible, directly or indirectly, for most of the greenhouse gas emissions (at least 70%) produced on the planet. These emissions are generated mainly to produce the goods and services used by consumers, primarily of medium and high incomes; and to maintain urban functions and structures (transport, management of mass and energy flows, etc.).

All these factors also alert us to the opportunity of resilience, understood as the ability of communities to resist, adapt to and recover from disturbances to their environment, an essential concept to facing a changing and variable climate.



This, in view of all the above, reiterates the validity of the statement that the fight to mitigate, adapt and be resilient to climate change will be won or lost in cities. The key to slowing down and, where possible, reducing global warming focuses on how cities produce, on the lifestyles employed, and on how metabolic flows are managed. In short, cities need an organisation that allows them to face the future with a greater ability to anticipate and reduce uncertainties. In any case, even if greenhouse gas emissions are contained, cities will have to adapt to the impacts described above. This is a very real challenge for cities, as is having and enforcing a suitable culture of energy efficiency. Land and urban planning that adapts to the effects of climate change and helps to prevent it will allow us to optimise and reduce energy and water consumption and be more energy efficient. These plans can therefore be our best allies in reducing air, water, soil and subsoil pollution and in planting the seed for the proper management of resources.

However, climate change is complex in nature, affecting multiple sectors, many of which are of interest to this Urban Agenda, including: agriculture and livestock; fishing and water resources; infrastructures and mobility; urban planning, housing and tourism; energy and industry. Contributing to sustainable, emissions-neutral development that is better adapted to the impacts of climate change will require us to work in all of these areas, which will require a committed, coordinated effort and an integrated approach.

The Climate Change and Energy Transition Act, which is already in the process of being drafted, will undoubtedly contribute to this coordination and to the adoption of a comprehensive strategy that ensures Spain will fulfil its commitments to the European Union in the areas of energy and climate, within the framework of the Paris Agreement on global warming. The rules that Spain's regional governments themselves are approving in their respective territorial areas are already achieving this.

For its part, the Urban Agenda identifies the following specific goals with the lines of action listed below, which are intended to help prevent and reduce the impacts of climate change.

SPECIFIC GOAL

3.1. ADAPT THE TERRITORIAL AND URBAN MODEL TO THE EFFECTS OF CLIMATE CHANGE AND ADVANCE IN ITS PREVENTION.

LINES OF ACTION

- ✓ Develop **sectoral, territorial and urban plans** that seek to **prevent** natural risks and that guarantee the application of specific standards in this regard to infrastructures, facilities and buildings.
- ✓ Incorporate **natural risk maps** to planning so as to avoid urban transformation activities that are susceptible to being affected by flooding, torrential rains, sea level rise, water shortages, risk of landslides, etc.
- ✓ Include **new forecasts** in planning instruments that seek to adapt to and mitigate the effects of climate change: sea level rise, loss of fertile soil, torrential rains, forest fires, increased temperatures and extended periods of drought.
- ✓ Implement **emergency plans to deal with climate change and, more broadly, action plans for the climate and sustainable energy.**
- ✓ Promote **prevention and adaptation activities** in developed land that is likely to be affected by natural risks.
- ✓ Incorporate the concept of **urban green and blue infrastructures** into urban and land planning and management as multifunctional solutions based on nature that address urban problems that go beyond their functionalities to improve biodiversity, such as: treating flood-prone areas, reducing heat islands, fighting against climate change, reducing GHG emissions and, of course, adapting citizen leisure and enjoyment in these spaces. It would be advisable to draw up regulations that structure how to introduce these actions into urban policies¹, the mechanisms and frameworks for financing them, standards and indicators, as well as specific awareness campaigns, especially on their benefits.
- ✓ **Reduce the heat island effect in current cities** by acting on the factors that influence the climate behaviour of urban environments. To do this, it could be useful **to promote the sealing and vegetation of public spaces**, to incorporate the mapping of urban climate into urban planning and management tools.
- ✓ Approve and implement **industrial conversion plans and programmes** for polluting industries to improve the environmental performance of “mature” industrial establishments and to

¹ As part of the preliminary work to develop the National Strategy for Green Infrastructure and for Ecological Ecoconnectivity and Restoration, a “Guide to plan and design the urban green infrastructure” has been drawn up (Del Pozo & Rey Mellado, 2016. MAPAMA, Madrid)



reduce the adverse effects of their activities on people and the environment.

- ✓ Work through **city networks** (Climate Network, Spanish Network for Local Sustainability, Provincial Networks of Municipalities for Sustainability, etc.) to promote common mitigation and adaptation activities in all the member municipalities. This can be done by striking agreements and approving strategies that seek to reduce the number of serious accidents due to disasters, improve air quality, reduce the negative environmental impact per capita, manage waste and many other objectives.
- ✓ Promote **campaigns** to improve education and **raise awareness** on climate change mitigation, in which consumer habits play a key role.
- ✓ Encourage **citizen participation and education** as an important element in caring for the environment, especially the urban environment.
- ✓ Implement a **truly democratic process for risk management** that involves all the stakeholders (experts, governments, the private sector, civil society, etc.) in the deliberation and also in the management itself.

SPECIFIC GOAL

3.2. REDUCE GREENHOUSE GAS EMISSIONS.

LINES OF ACTION

- ✓ Incentivise and promote a **low-carbon urban model** by following national and international measures and recommendations (public services, infrastructures, buildings, etc.)
- ✓ Manage land and building uses by taking into account **bioclimatic aspects** of energy efficiency and functionality.

- ✓ Implement **zero emissions strategies** in urban environments.
- ✓ **Reduce dependence on private vehicles** and the impacts of **motorised travel** by promoting a compact and complex urban model. This will also serve to reduce fuel consumption and polluting emissions.
- ✓ Use **clean technologies**, materials and products that eliminate or minimise polluting emissions and greenhouse gases.
- ✓ Promote **the renewal of the vehicle fleet**.

SPECIFIC GOAL

3.3. IMPROVE RESILIENCE TO CLIMATE CHANGE.

LINES OF ACTION





- ✓ Develop **resiliency plans against climate change** and ensure that, once in place, they are known and easily accessible to citizens. Use this tool to preserve and improve living conditions.
- ✓ Leverage **the landscape as an opportunity and value** for each town and city, incorporate the term “**ecological restoration**” and transform **green areas into indigenous models** in the collective imaginary that allow for the efficient management of resources.
- ✓ **Prepare to be resilient**, that is, to deal with possible crises (supplies, strikes, breakdowns, natural disasters, etc.) before they materialise. This requires **assessing various scenarios** by studying which elements of the urban system are most involved, conducting **stress tests**, optimising investments to reduce risks and avoid possible sequences of failures. A suitable diagnosis, cooperation among all the necessary actors, including civil society, and assessing the resilience in previous crises can be very useful. To this end, we propose approving action protocols.
- ✓ **Be mindful of the spatial layout of the city, its morphology** (urban rugosity, urban canyon, visibility of the sky, etc.), the presence of vegetation, or the albedo of materials on urban surfaces to minimise the impact of heat waves, the effects of which are increased by the so-called “urban heat island”. Apply **bioclimatic criteria** to the design of open spaces.
- ✓ Consider the **urban heat island** phenomenon in urban planning and design, as well as in the design and construction of buildings. This will require studying the influence of regional and local climate and drawing up **an urban climate map** to analyse the heat absorption and transfer capacity of urban materials (over-heating map) and the ability to eliminate that heat (urban ventilation map). For building construction, bioclimatic architecture solutions will be studied that contribute to reducing greenhouse gas emissions.
- ✓ Promote the conservation of **indigenous animal and plant species**. Increase the land surface capable of supporting vegetation and improve its permeability.
- ✓ Develop specific projects **to prevent flood damage**.
- ✓ **Reduce deforestation and improve ecosystems**.

The **descriptive data** involving strategic goal #3 “*Prevention and reduction of climate change impacts and improvement of resilience in towns and cities*”, are as follows:

STRATEGIC GOAL #3. RELATED DESCRIPTIVE DATA

D.01	Population change	D.02	Territory and diversity of habitats	D.03	Surface area of agricultural and forestry operations
D.05	Green area	D.12	Parks and facilities in green spaces	D.14	Age of the building stock
D.18	Motorisation rate	D.21	Funding for cycling lanes	D.39	Urban agenda, strategic planning and Smart Cities

The relationships between this strategic goal and the SDGs and the goals of the 2030 Agenda for Sustainable Development and other international projects can be summarised as follows:

SPANISH URBAN AGENDA	17 SDGS: GOALS	NEW INTERNATIONAL URBAN AGENDA	EUROPEAN URBAN AGENDA (PARTNERSHIPS)	EDUSI SPECIFIC GOALS 14-20
3.1. . Adapt the territorial and urban model to the effects of climate change and make progress toward its prevention	 13.2 Strategic Policies and National Plans 13.3 Education and awareness	65; 68; 78; 79; 101	Energy transition Air quality Climate Change	S.G.4.5.1. Promote sustainable urban mobility: clean urban transport, public transport, urban/ rural connection, improvements to the road network, cycling and pedestrian transport, electric mobility and development of clean energy supply systems
	 11.b Reduce risk from disasters in cities			
3.2. Reduce greenhouse gas emissions	 3.9 Environmental health	55; 79		
	 11.6 Waste and pollution in cities			
3.3. Improve resilience to climate change	 1.5 Resilience to economic, social and environmental disasters	67; 77; 78; 80; 101; 144		
	 11.5 Disasters and reduced vulnerability			
	 13.1 Resilience and adaptation			