Expo 2027 Malaga

SUSTAINABILITY PROPOSAL CANDIDACY
THE URBAN ERA: TOWARDS THE SUSTAINABLE CITY
CITIZENSHIP, INNOVATION AND THE ENVIRONMENT

EXPO 2027 MÁLAGA SPAIN

Specialised Expo 2027 *Candidate*

Ayuntamiento de Málaga
Gerencia Municipal de Urbanismo
Obras e Infraestructuras

GOBIERNO DE ESPAÑA
MINISTERIO DE ASUNTOS EXTERIORES, UNIÓN EUROPEA Y COOPERACIÓN

Junta de Andalucía

Diputación Provincial de Málaga

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Gerencia Municipal de Urbanismo, Obras e Infraestructuras

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DIR. GENERAL EXPO 2027: **JERÓNIMO BLASCO JÁUREGUI** | GTE. DE URBANISMO: **JOSÉ CARGADOR JIMÉNEZ**

EQ. REDACTOR / ARQUITECTO TÉCNICO: **CARLOS ROMERO VERA** | MAQUETACIÓN Y DISEÑO: **FCO. JAVIER SERRANO VÁZQUEZ**

1 CHALLENGES

Demographic growth and the tendency towards the concentration of the population in our cities makes it necessary to reflect deeply on the type of city we want, which allows personal development in a **safe, accessible, healthy, egalitarian, inclusive and participatory environment, enables healthy coexistence, cultural development,** employment, innovation, environmental protection and promotes economic growth within the framework of sustainable development set out in the **2030 Agenda**.

The urban era has to look with ambition towards a future marked by **climate change**, with innovative criteria in urban development and urban regeneration, addressing mobility management, planning green and natural spaces, applying policies of savings, energy efficiency, awareness, citizen participation and cooperation, in accordance with the SDGs.

2 OBJECTIVES

The International Exhibition of **Malaga 2027** will actively contribute to the Sustainable Development Goals **(SDGs)**, allowing a **space for reflection** on one of the main challenges facing contemporary society: making population growth and urban development compatible with environmental protection and the adoption of innovative solutions that guarantee an improvement in the quality of life for all city residents.

Malaga 2027 will allow, through the **exchange of knowledge**, solutions and experiences, to propose what will be the urban development of the coming decades, in a city recognized for its environmental awareness and innovation.

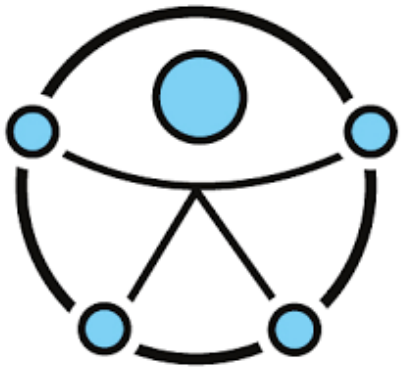
The **EXPO** will be a **reproduction of the urban ecosystem**, the model of the sustainable city that adapts to its environment, improving it based on modern environmental standards, applying the latest technological advances in construction materials, efficiency, renewable energy, water, air and waste treatment, managed with ecological public procurement criteria, from its design to post-expo uses, with the objective of the entire process to reduce environmental impact and develop the **circular economy**.

2.1 The territorial footprint. Design adapted to the environment

The main building of the **EXPO** is designed with a circular structure, forming a **ring that adapts to the terrain** and manages to rationalize the distribution minimizing routes, optimizing resources and concentrating the footprint on the territory. It will be a **flexible building** that will allow its reuse as a business and research center linking the university, logistics and business facilities. The ring of the **EXPO** is designed with a radial structure that modulates spaces and routes and is permeable to connect with the interior green space of the enclosure. In turn, these support beams offer shadows to the lower levels, protecting the homogeneous facades of the pavilions, with surroundings that control the **energy demand**. On the upper level of the building, the **green roof**, which will improve the energy performance of the building and capture CO2, will be combined with areas prepared for solar energy collection.

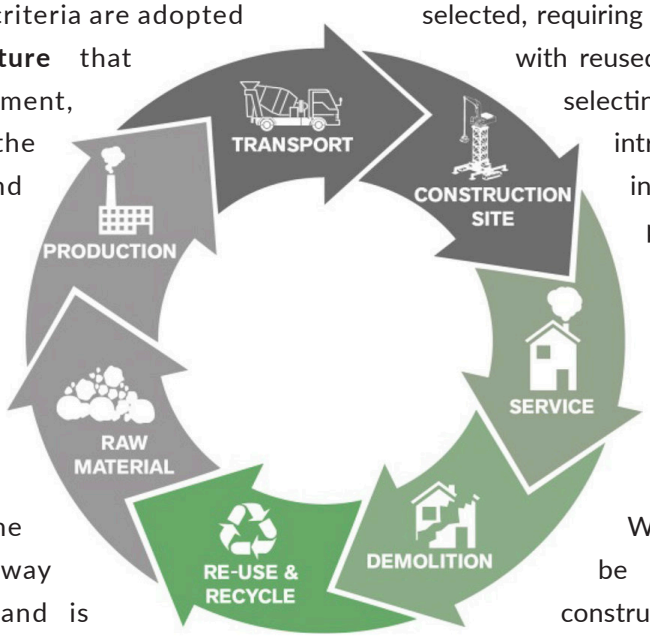
2.2 Universal accessibility

The sustainability proposal of **Expo 2027 Malaga**, focuses on people, designing spaces from the point of view of universal accessibility that allows **autonomy**, use and understanding at any point of the enclosure, with easily identifiable routes with surface-guide treatment, adapted urban furniture, high contrast signage and auditory systems all supported by new technologies.



2.3 Sustainable design and construction, net-zero emissions

With a constructed area of 250,000 m², the **EXPO** sets the goal of **net zero carbon emissions**. Design criteria are adopted for **bioclimatic architecture** that adapts to its environment, which takes into account the climate, passive demand control strategies, the efficiency of facilities and the integration of energy collection systems from renewable sources.



In the construction of the buildings, **materials with a long life cycle** and low environmental impact will be selected, requiring materials manufactured with reused and recycled content, selecting companies that introduce carbon capture in the process and prioritizing the use of local material which minimizes transport, thereby achieving the **reduction of CO2** before its creation.

The building adapts to the existing terrain in such a way that the movement of land is reduced and the excavated material is reused, lessening transport which minimizes CO2 emissions.

Waste treatment will be carried out during construction that will **valorize 80%** of the waste generated, through selective separation at source, which will exceed the EU Directive 2018/851 percentages.

2.4 Renewable energies

Nearly zero-emission buildings (NZEB) are planned, so on-site renewable energy production is necessary. To this end, **photovoltaic, thermal, wind generation and green hydrogen production** are promised within the framework of Spanish and European legislation that aims to achieve carbon neutrality by 2050.

The support of new technologies will allow the creation of a **"smart grid"** with automated controls that connect energy production and demand and increase efficiency.

Photovoltaic, wind and thermal generation.

On the roof of the main building there will be 35,000 m² of **high-efficiency solar collectors**, which will combine flat monocrystalline photovoltaic collectors with vertical ones, to take advantage of a greater number of hours of sunshine, generating 7 MWp for self-consumption, which will be supported by high-capacity lithium batteries achieving self-sufficient.

Power generation will be supported by vertical axis **wind turbines**. Solar thermal collectors will be used to provide domestic hot water (DHW), supported with aerothermy, on the 9 distribution cores, which will cover the DHW needs of the toilets on the grounds.

The 4 service buildings will have 4,000 m2 of surface area on their roofs for the installation of photovoltaic modules with a capacity of 0.5 MWp, supported by wind turbines.

Green hydrogen.

Expo 2027 Malaga is committed to reducing emissions in line with the European Green Deal and its **EU Hydrogen Strategy** that establishes the guidelines for developing the role of clean hydrogen.

Next to one of the auxiliary buildings will be installed a **green hydrogen plant**, obtained through electrolysis process, which will serve to supply **public transport** vehicles powered by hydrogen fuel cells. This plant will be supplied by the solar farm that will be installed in the parking areas with a capacity of 4 MWp and will take advantage of the surpluses of the rest of the solar installations of the **EXPO**.

The outdoor lighting will incorporate solar modules that will not need to be connected to the grid thanks to lithium batteries and LED lighting, they will be supported with wind turbines on the same poles.

All of these measures enhance the creation of an energy microgrid that will be controlled with the latest technological advances that will achieve maximum efficiency and will mean a drastic reduction in **CO2 emissions**.

2.5 Sustainable mobility

The City of Malaga has made a firm commitment to its sustainable mobility model, promoting a **new culture of mobility,** which is based on awareness and citizen participation that encourages public transport and active travel in combination with urban planning that configures a compact and complex city model of short distances that allow quick access to equipment, services, shops and businesses.

Active transport is promoted with the integration of green corridors that allow pedestrian movement and enhance the bike lane network, which will go from the current 47 km to more than 140 km in 2027.

Access to the site will be through **pedestrian paths** that will connect with bus, metro, train and parking stops for private and collective vehicles, which in turn will be supported by electric shuttles that will connect the different entrances to the EXPO.

The City's public transport will be sustainable by 2027, expanding the **electric urban bus** network to 100% of the fleet. Malaga **metro Line 1 will be extended** to serve the EXPO, with a new stop that will allow you to get there on foot in less than 10 minutes or by electric shuttles.


A **new railway stop** will be built for the **EXPO´s** southern entrance, being able to access the site in less than 10 minutes on foot or by shuttles.

Malaga´s metropolitan connectivity will be reinforced by the **promotion of the railway corridor** that will connect the city with the towns to the east and west, which together with the **modal interchanges** will achieve the drastic reduction of private vehicle usage.

Measures that will put the citizen at the center, gaining pedestrian spaces, reducing noise, improving the environment and **reducing CO2 emissions** by more than 70%.

It is estimated that during the event, the transport of private vehicles and metropolitan buses will generate 19,700 tons of emissions, which if all the compensations were monetary would currently amount to €1,970,000.


2.6 Environmental proposal

The **EXPO** will be integrated into the environmental infrastructure of the city, helping to configure a large **green corridor that vertebrates the urban space** and manages to connect it with its environment, which favors **biodiversity**, purifies the water cycle, improves air quality and reduces the ecological footprint. The Guadalhorce green corridor crosses the EXPO site and connects the river with the mountains of Malaga.

Inside the grounds.

With an area of **86,000 m² of open spaces**, pedestrian routes and rest areas will be established protected by tree masses and pergolas covered with vegetation and solar collectors, which on the hottest days will be supported by water nebulizers, turning them into a climate refuge, as already contemplated in the agreement of the Malaga City Council of April 2022.

The banks of the Merino stream that pass through the ring will be replanted with formations of riparian vegetation, in addition to shrub structures typical of the banks. The strategy is to recover and enhance the fluvial qualities of the stream, to favor the appearance of spaces, routes and activities on its banks.

Filtering pavements will be used to allow water drainage to the ground, which reduces runoff, prevents heat retention and favors evapotranspiration.

A **tertiary water treatment** plant will be installed that will allow its reuse and discharge into the natural stream.

Urban park, a carbon sink.

The objective is to recover a space by reproducing the **Mediterranean forest**, with representation of other habitats with similar climates that will add value to the botanical heritage of the city, with leafy trees that allow creating a tree canopy with a shade surface of more than 90% and vertebrated by lines of pyramidal trees as a continuous formation. A new lung for the city and a **carbon sink**.

As a continuation of the forest, the land dedicated to the general parking, is structured in a reticular way, separating the roads with linear spaces with filtering paving for pedestrian flow. These transit lines are equipped with tree structures, which create shadow lines and allow mobility of environmental quality from the vehicle to the interior of the grounds.

Waste treatment.

Without forgetting that the fundamental pillar to control waste is social awareness, the municipality will give citizen the tools that allow them to collaborate actively in the **circular economy**, with the reuse, reduction and recycling of waste.

The Expo sets the goal of **Zero Waste**, with reduction of packaging, reuse of containers, facilitating the separation with the installation of selective containers that will allow a subsequent **efficient management of waste**, with the recovery of materials, generation of compost and use of gases generated for energy production, supported by a control and monitoring system for the entire process.

2.7 Accompaniment plan. Completing the transformation of the city.

Malaga advances with a sustainable urban development that promotes urban regeneration and complete integration with its surroundings, a city open to the **Mediterranean Sea**, which integrates into its green zone the **Guadalhorce & Guadalmedina rivers** and the **Malaga Mountains**, improving biodiversity and air quality.

A connected city that is committed to **sustainable mobility**, based on public transport and active mobility, with more pedestrian spaces, less noise and low emissions.

Expo 2027 Malaga will promote the achievement of the objectives so that Malaga is a benchmark for the sustainable city through the implementation of **innovative proposals**, which focus on **citizenship** and **environmental protection**.

Transport and comunication.

Sustainable mobility is one of the central axes of any city that aspires to improve the quality of life of its citizens and the environment, so it is necessary to **plan urban development** and public transport infrastructures, facilitating **zero-emission connectivity**.

Metro network.

Line 1 of the City's metro network will be extended, which will reach the EXPO grounds and will also serve for future urban developments in the area.

Railway Infrastructure.

Construction of a **new station** for the commuter rail at the southern entrance of the EXPO that will connect future residential developments and industrial parks.

The rail connection with the Port of Malaga will be place underground, which will eliminate interference with road traffic, eliminate heavy transport, improve circulation in the area and reduce emissions.

The extension of the **coastal train** will be promoted, which would reduce private traffic.

Road integrations.

Pedestrian areas will be expanded with an ambitious intervention on the banks of the **Guadalmedina** river, turning it into a green corridor and an urban axis connecting facilities, services and neighborhoods, gaining spaces for pedestrians, eliminating barriers and revitalizing the area.

The **Coastal Axis** will intervene in front of the historic center of the city, burying the existing road will eliminate the interference of vehicles in the connection of the city with the port, prioritizing **public transport** with the reservation of a Bus-HOV lane and creating 65,000 m² of **public green spaces** that recover the seafront for pedestrians.

Modal interchangers.

Two modal interchanges will be built, both underground, the first at the long-distance and commuter train station, which will allow connection with the metro, long-distance bus, and urban bus.

The other interchange will be located in the Plaza de la Marina (next to the City's port), which will be the intercity bus station and will allow the connection with urban buses and the metro that will be complemented with parking spaces for electric vehicles and bicycles.

Road Network.

Development of the **connectivity** of the area in which the **EXPO** will be located, with walkways linking the north entrance with the **University** and the new **metro** stop. Connection with the west node of the A-357 motorway.

The new northern access to the **Malaga-Costa del Sol international airport** will connect with the new metropolitan west road interchange, the **A7 motorway** and the **EXPO**.

Redevelopment, reorganization and expansion of the southern road of the EXPO, Av. Ortega y Gasset, with **pedestrian areas, bike lanes, and lane reserved for public transport**.

Pedestrian and bike lane connections from the new railway stop of La Corchera.

90-km extension of the municipal bicycle lane network that will interconnect the entire city and give north, south, east and west access to the **EXPO**.

Environmental intervention.

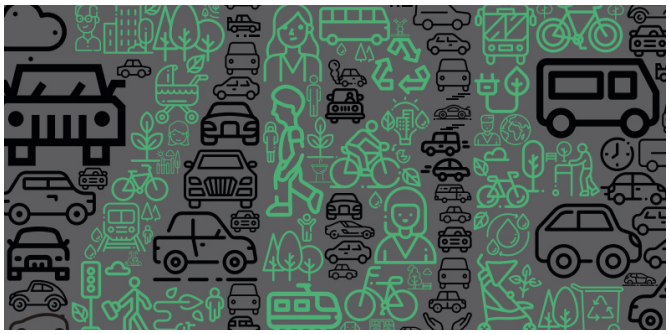
Expo 2027 Malaga is integrated into the **green zone of the city** and will serve as a connection between the Malaga Mountains and the Guadalhorce River. The Merino stream and the Ardales-Malaga pathway travers the **EXPO** grounds where work will be carried out to **renaturalize** the stream and the path that will continue to the north and south of the site.

In the immediate vicinity of the **EXPO**, an **urban park of 223,000 m²** will be built in which the different uses of urban development will be integrated.

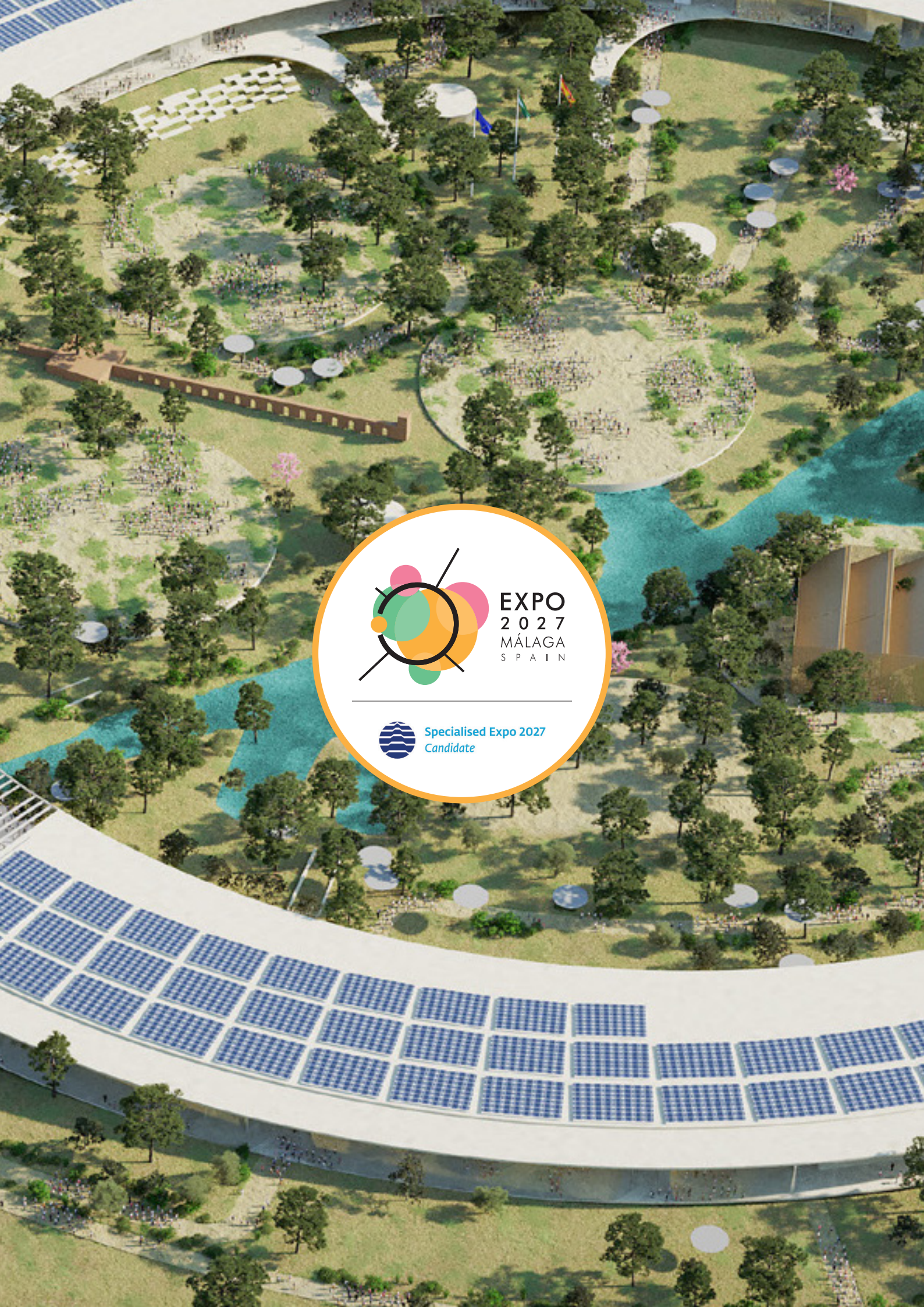
In the immediate surrounding areas, projects will be developed to transform degraded spaces into an urban park and to renaturalize the "Los Prados" wetland.

In the rest of the city, the development of **8 new urban parks**, the integration and **environmental recovery** of the surroundings of the **Gudalmedina** and **Guadalhorce** River and an ambitious plan to form the "**green belt**" of the city, which would have the capacity to absorb more than 3 million tons of **CO2**, are all being considered.

The **low-emission zone** in the center of the population will be completed, which in addition to the interventions on roads, contemplates the environmental conditioning of all the spaces reclaimed from private vehicles and the urban districts in the area. This action will serve as a basis for further expanding the low-emission zone to the rest of the population.



The **seafront** will be renewed and conditioned with actions that will facilitate the enjoyment of the citizen and promote active mobility.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