

## Roadmap towards climate neutrality by 2050

## EXECUTIVE SUMMARY

Con el apoyo de:

Climate-KIC  
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2022 update

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OPPORTUNITY

The Roadmap provides a **technical analysis that aims to support the political commitment to action against Climate Change in the City of Madrid**. This commitment, already reflected in the Madrid 360 Environmental Sustainability Strategy and in the Air Quality and Climate Change Plan, as well as specifically in different institutional declarations (Climate Emergency Declaration 2019, COP 25, City Council Agreements for Recovery "Pactos de la Villa" 2020) requires a development for which the Roadmap represents an essential starting point. It indicates the levers of transformation and the priority measures that make possible to drive the city towards climate neutrality from a technical, social and economic feasibility perspective.

In view of this climate innovation approach, Madrid is part of the **European Mission: Climate-Neutral and Smart Cities**, which aims to support, promote and showcase the transformation of 100 European cities towards climate neutrality from 2022 to 2030, to turn them into experiment and innovation centres as an example to other cities.

The Roadmap towards climate neutrality for 2050 of the City of Madrid presents Madrid with a great challenge that involves an urban transformation and a transversal integration of climate action in municipal policies, through innovative processes and collaboration mechanisms to accelerate the transition to climate neutrality, aligning municipal policies with European and National policies.

The goal of this Roadmap is to reduce Greenhouse Gas Emissions in the City of Madrid by 65% in 2030, compared to 1990, and reaching climate neutrality by 2050.

However, the Roadmap not only responds to the objective in terms of emission reduction for 2030/2050, but also aims to provide a framework for improvement in the quality of life, the development of a low-carbon economy and greater security and resilience against climate risks.

## POLICIES, PLANS AND ACTIONS

To know the status and evolution of these emissions into the atmosphere, the Madrid City Council annually prepares the Inventory of Greenhouse Gases (GHG) following the rigorous internationally recognized protocols. The inventory offers information on the emissions that are generated directly in the municipality, as well as the indirect ones that derive from electricity consumption and losses due to distribution, broken down by activity sectors. The values of the Greenhouse Gas Emissions Inventory for 2019 show a total volume of emissions of 10,048 ktCO<sub>2</sub>eq (kilotonnes of carbon dioxide equivalent), of which 7,208 ktCO<sub>2</sub>eq (71.7%) are direct emissions and 2,840 ktCO<sub>2</sub>eq (28.3%) indirect.

In recent years, the City of Madrid has implemented policies, plans and actions to reduce GHG emissions. These actions have usually been associated with other municipal plans such as those for air quality, mobility or urban regeneration. As a result, the temporal trend of GHG shows a decreasing trend in recent years, with significant reductions in the period 2000-2019 for the main sectors (direct emissions from the "RCI" sector have decreased by 11.9% and those from road transport 34%). The indicators also show a much lower figure for emissions per capita in the municipality of Madrid (3.1 t CO<sub>2</sub>-eq / inhab), in relation to the National average.

However, to achieve the proposed objectives it is necessary to intensify the decarbonization measures and **the Roadmap provides information on the sectors and levers with the greatest potential for reducing emissions**, identifying those transformative actions of the municipal plans that accelerate the transition towards a low carbon urban model.

## SECTOR AND LEVERS WITH THE GREATEST POTENTIAL FOR REDUCING EMISSIONS

The **residential sector** should contribute to the greatest volume of reductions, followed by the services sector and the transport sector. The sum of the emissions abated by these three sectors represents 90% of the emissions to be reduced. In the sectors related to construction and urban planning, it is worth highlighting the need to accelerate and prioritize electricity generation from renewable energies as a primary lever for reducing emissions, an action in which capacity at the municipal level is very limited. Other actions, such as the technological improvement of equipment and the progressive electrification of energy demand in the residential, commercial and institutional sectors open up greater opportunities for local action. In the mobility sector, and apart from the specific case of air transport, the City Council has a greater capacity to intervene in multiple levers to reduce emissions associated with urban mobility patterns with the general approach of avoiding travel, promoting change modal to lower emission options and improve vehicle technology (Avoid-Shift-Improve).

## ECONOMIC ANALYSIS

However, the greatest threats and barriers will be those related to social and economic aspects. The goal of a carbon neutral city can be achieved but within **public-private-social collaboration in all aspects of the process**.

This urban development can only be understood in an inclusive society in a favorable and sustainable economic context. Measures to overcome these barriers must be aimed at the development of flexible governance models that incorporate the climate variable, alignment of the policies of the different administrations, agile and efficient financial and budgetary strategies. In this sense, institutional coordination is crucial as well as economic evaluation to assess the returns obtained that facilitate the implementation of measures, the development of tools for monitoring the effects of climate change and timely information on the effects of climate change on aspects close to the citizens.

The **economic analysis** carried out shows that many of the levers and actions identified, particularly those for mobility, present a balance that reports economic benefits (negative net cost) and a return on investment of more than 50% in the long term, motivated not only by the direct savings produced but also by other co-benefits, for example, in health matters associated with the implementation of the measures.

Reducing GHG emissions is the priority objective of climate action, however, the consequences of global warming also require a response to the threats and impacts that are already occurring. The modification of the global climate system generates chain effects that reach the local scale and that are not limited to environmental aspects, but have a social and economic impact on the most vulnerable areas. This Roadmap aims to guide the city of Madrid towards meeting the goal of achieving neutrality by 2050, but it also incorporates the vision of increasing the capacity to adapt to the adverse effects of climate change and promoting resilience to face climate risks.

## INTEGRATION OF THE CLIMATE APPROACH IN POLICIES AND REGULATIONS

The Roadmap provides a baseline analysis and guidance that will be developed by the Madrid City Council using appropriate tools for municipal coordination between projects, the integration of the climate approach in policies and regulations, as well as innovative financing mechanisms. Collaboration with other local agents, Regional and National Administrations, and research and innovation centers is also essential to achieve the objectives pursued. Finally, it is necessary to highlight the importance of international urban networks and initiatives in charge of supporting and making visible the leading role of cities in the global challenge of Climate Change.