MADRID

Roadmap to climate neutrality by 2050

EXECUTIVE SUMMARY

With support from: Climate-KIC, C40 CITIES Climate Action Planning, MATERIAL ECONOMICS, Monitor Deloitte.

2024 update

THE OPPORTUNITY OFFERED BY THE ROADMAP

The Roadmap **provides a technical analysis** whose **purpose is to support the city of Madrid's political commitment to taking action on climate change.** This is an environmental challenge whose impacts are ever more visible, with direct and profound effects on Madrid's society and economy.

This commitment, which is already reflected in the Madrid 360 Environmental Sustainability Strategy, the Air Quality and Climate Change Plan, and specified in several institutional declarations (the Climate Emergency Declaration 2019, COP 25, 'La Villa' Agreements 2020) requires a programme of development, for which the Roadmap is an essential starting point. This document details the levers for transformation and top-priority measures that turn the will to drive the city towards climate neutrality into a technically, socially and economically viable prospect.

This Roadmap **has the target of a 65% reduction of the city of Madrid's greenhouse gas emissions by 2030, compared to 1990, and achieving climate neutrality by 2050**.

As part of this focus on climate innovation, Madrid is a member of the **EU Mission for climate-neutral and smart cities**, whose purpose is to support, promote and demonstrate the transformation of 100 European cities to climate neutrality, turning them into experimentation and innovation hubs as an example for other cities.

As part of its commitments within the EU Mission, the **Madrid Climate City Contract** was signed at the end of March 2023. This document details the top-priority lines of intervention to meet these objectives, shaped to fit this territory: new urban developments for a climate-neutral city; creating a new culture for citizens of the future through interventions that transform university campuses and schools into climate-neutral environments; and the transformation and regeneration of a consolidated city in which public space and facilities act as climate-neutral nodes. Additionally, in October 2023, the European Commission awarded Madrid the **'Mission Label'**, recognising the city's ambition and work on developing its Climate City Contract.

POLICIES, PLANS AND ACTIONS

Over the past few years, the city of Madrid has set in motion policies, plans and actions to reduce Greenhouse Gas (GHG) emissions, endeavouring to move all the different municipal policies in the same direction.

Mitigation efforts have focused on the highest-emitting transport and building sectors, through the development of convergent policies such as those addressing air quality, building renovation and energy efficiency. Thanks to the combination of actions taken at a municipal level and by other institutions and sectors, the city of Madrid is generally on the right path when it comes to emissions reductions. By 2021, the municipality's direct GHG emissions had decreased by 24% and indirect emissions had decreased by 60% compared to 1990, which translates to a total emissions reduction of 37%. Nevertheless, the trends show the need to move faster and increase GHG reduction rates.

To meet the objectives set out in this Roadmap, it is necessary to continue and escalate emissions mitigation policies, while keeping in mind the associated co-benefits of addressing challenges such as **decoupling economic growth from increasing energy consumption and emissions** and promoting an inclusive form of development that engages the general public and helps foster social cohesion, supporting the move towards sustainable models of urban transformation.

THE SECTORS AND LEVERS WITH THE GREATEST POTENTIAL EMISSIONS REDUCTIONS

The **residential sector** is expected to contribute the greatest volume of emissions reductions, **followed by the services and transport sectors**. The sum of the emissions abated by these three sectors covers most of the emissions reductions needed, at over 91%.

In the sectors related to **building and urban planning**, it is worth underlining the need to accelerate and prioritise electric-power generation from renewable energy sources as the key lever for emissions reduction. Other actions, such as the technological upgrading of equipment and progressive electrification of energy demand in the residential, commercial and institutional sectors, open up more opportunities for local action. The Housing Policy Area recognises that the decarbonisation commitments require increasing the rate of energy-efficiency renovation tenfold before 2030. Municipal capacity is focused on awareness-raising and informing the population, creating incentives for the adoption of more efficient technologies, and providing financial support to renovation and energy-efficiency projects through the Plan Rehabilita (Renovate Plan), aimed particularly at the sectors of the population with the fewest resources.

The **services sector** contains the commercial, administrative, cultural and sports buildings belonging to the private sector and the various governmental agencies and institutions, as well as the fixed assets pertaining to municipal services (public street lighting, tunnels, traffic lights, fountains, etc.). This sector plays a very significant role in demonstrating the use of electrified solutions for buildings with zero local emissions, in which municipal buildings and services should lead the way, given their mobilisation capacity and duty to set a positive example.

In the **mobility** sector, besides the specific case of the aviation transport sector, the City Council has greater capacity to take action on the multiple levers for reducing the emissions associated with urban mobility patterns, with a general focus on avoiding travel, promoting a modal shift to lower-emission transport options, and improving vehicle technology.

However, the greatest threats and barriers to successfully reaching climate neutrality are related to social and economic factors. The objective of creating a carbon-neutral city can be achieved, provided that there is **public–private–social collaboration in all parts of the process**. This urban development will only work in an inclusive society and a favourable, sustainable economic context. The measures to overcome these barriers should aim to develop flexible governance models that incorporate the climate variable, align the policies of different government agencies, and ensure that financial and budgetary strategies are responsive and efficient. Institutional coordination is essential to achieve this, as is economic assessment to establish the value of returns obtained that facilitate the implementation of measures, the development of tools to monitor climate-change impacts, and appropriate information about the aspects of these impacts that are most relevant to the general public.

ECONOMIC ANALYSIS

On the basis of Madrid's Climate City Contract and as part of its commitments within the 'EU Mission for climate-neutral and smart cities', a series of economic studies were carried out in April 2023, which enabled the priorities and key principles for securing climate neutrality in the city to be modelled. This Contract provided the economic case for the main decarbonisation levers established, and also analysed the financing needed from the various actors.

The economic case for most of the decarbonisation levers is favourable or very close to neutral, whereby the savings obtained compensate for the investment made. This new study confirmed that the scenarios for the levers associated with **transport** are favourable and, importantly, also showed the abatement cost of **decarbonising the electric-power system** to be favourable.

This study also estimated the investment needed to implement the measures and decarbonisation levers set out in the Roadmap, bearing in mind the co-benefits associated with these measures and the various actors involved. The direct investment (NPV) up to 2030 is estimated to be €7.9 bn, with a return on investment (ROI) of 105%.

THE SOCIAL DIMENSION

It is vital to carry out a **social analysis** that enables policymakers to design climate actions according to diversity, equity and inclusion criteria and to identify the potential barriers to access and acceptance of these measures by people in the wide range of social situations that exist in the city. Attending to the specific needs of collectives that face particular challenges is essential in order to develop more equitable and effective emissions-reduction policies. The working method used to revise this Roadmap was therefore based on processes of engaging with and attending to real social situations. This was a collaborative effort, making use of participatory channels in the various projects promoting climate neutrality, and partnering with agencies specialised in social action such as the Red Cross (Cruz Roja), Oxfam, Porticus, EAPN and Save the Children.

The inclusion of data and indicators related to the risk of exclusion, such as the EU's AROPE (At Risk of Poverty and/or Exclusion) indicator, and tools incorporating the principle of creating no associated harm, such as the EU's DNSH (Do No Significant Harm) principle, enable an ethical criterion to be applied to the Roadmap. This is used to steer resource allocation towards the specific measures and actions that not only generate environmental benefits but also promote social equity.

It is important to underline that the energy transition to climate neutrality has enormous potential for generating a positive social impact, tackling fundamental issues such as the improvement of living and mobility conditions, creation of high-quality jobs, and reduction of energy poverty.

CONCLUSIONS

The process of moving towards climate neutrality requires a profound urban transformation that encompasses the social, economic and environmental spheres. The challenge is to overcome the various sources of inertia and resistant attitudes that hold back this progress, in order to create new paradigms and momentum that can drive Madrid naturally forwards to climate neutrality, economic prosperity and social inclusivity.

The Roadmap sets Madrid a great challenge that requires an urban transformation and the cross-cutting integration of climate action into municipal policies.