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Madrid Climate City Contract

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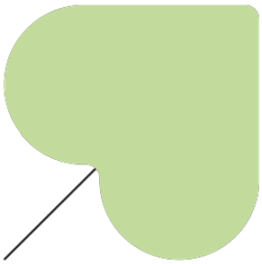

Madrid

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Introduction

At a crucial moment in the global response to climate-related emergencies, the EU is committed to leading climate action and has set the targets and legislation to achieve this. Thus, the EU must reduce its emissions by at least 55% by 2030 and achieve climate neutrality by mid-century. In this context, cities have a key role to play, both to accelerate the decarbonisation process and to ensure a fair and equitable transformation that contributes to the well-being of society as a whole.

Cities, despite occupying only around 3% of the earth's surface, generate more than 70% of greenhouse gas emissions and consume more than 65% of global energy. And it is important that they act as centres of experimentation and innovation in the transition to climate neutrality.

The EU Mission "100 Climate Neutral and Smart Cities by 2030" aims to support the transformation of cities to accelerate the implementation of the Paris Agreement, and to be both a catalyst and driver for the implementation of the European Green Deal, and a demonstrator that it is possible to achieve climate neutrality by 2050.

In Spain, on 8 September 2021, the Government of Spain and the City Councils of Barcelona, Madrid, Seville and Valencia signed the Declaration "Climate Neutral Cities in 2030" (annexed to this document), as a boost to the commitments and initiatives of the signatory cities and as government support for the transformation of these cities to achieve climate neutrality and improve their resilience. Following the path opened, the City Councils of Soria, Valladolid, Vitoria-Gasteiz and Zaragoza adhered to the Declaration on 13 December.

In addition, on 15 September 2021, the Plenary of the Senate approved a motion urging the Government to push for climate neutrality of cities in the framework of the European Cities Mission. The motion recognises the fundamental role of cities in the response to the climate emergency and highlights the opportunity to accelerate the necessary and cross-cutting changes to make cities climate neutral by 2030. It also values that the different territorial administrations promote and facilitate the climate neutrality of Spanish cities through their incorporation into the Mission of Cities and through the development of transformation projects.

In this regard, on 25 November 2021, the Cities Mission launched a call for expression of interest addressed to European cities with more than 50,000 inhabitants interested in participating. Of the 377 that applied, 100 were selected from the EU-27, including the Spanish cities of Barcelona, Madrid, Seville, Valencia, Valladolid, Vitoria-Gasteiz and Zaragoza.

The Mission Implementation Plan foresees that each of the 100 selected cities will develop a City Climate Neutral Contract adapted to its own reality, through a process of co-creation and in close collaboration with the whole of civil society and citizens, detailing the strategy for the deployment and monitoring of innovative and digital solutions to achieve climate neutrality; and enabling other cities to follow their example by 2050. This document thus constitutes a clear political commitment, not only to the European Commission and national, regional and local authorities, but also to the public, and includes a comprehensive climate action plan in the different sectors, such as energy, buildings, waste management and transport, together with corresponding investment plans.

In this way, this document responds to the requirements of the European Cities Mission. It has been prepared by the city, with the participation of other public and private actors, and sets out plans to achieve climate neutrality.
In particular, it recognises that the Mission cannot succeed without being firmly anchored in the local community and garnering broad support. It therefore involves civil society, youth groups, cultural institutions and creative sectors, foundations, local media, small and medium-sized enterprises, private industry, trade unions, academia and research, and the public sector, among others, in their respective roles as decision-makers, users, consumers, producers and owners.

Furthermore, it integrates the city's own qualities and heritage, which guarantee the local dimension of the transition to climate neutrality, but also its inclusive character, in line with the values of the New European Bauhaus (art/culture, sustainability, society). It fosters a sense of ownership and ownership by the city's inhabitants and professional actors, showing that their unique contribution is relevant and that the fulfilment of this Climate City Contract will result in a better quality of life and a better environment for all.
On the other hand, it is configured in the framework of an iterative process, as a document that will be subject to monitoring and updating, both through the signing of

addenda and other accession documents, thus bringing together other actors necessary for the city to achieve the established goal of climate neutrality. In particular, the commitments contained therein may be expanded or updated to effectively contribute to the achievement of climate neutrality in the city.

The document is divided into several parts: one concerning the cities' commitment to achieve climate neutrality in the city; another concerning the institutional support and coordination of the different public administrations; another part concerning its monitoring and updating; and a final part comprising the annexes corresponding to the Climate Action Plan, the City Climate Investment Plan and the City Stakeholders and Commitments, which follow the models elaborated by NetZeroCities[1] .

[1] The NetZeroCities project is part of the Horizon 2020 Research and Innovation Programme and provides the necessary technical, regulatory and financial assistance to the cities of the European Cities Mission (https://netzerocities.eu/the-nzc-project/).

Commitment of the city of Madrid to climate neutrality

Introduction

Madrid has shown its commitment and involvement in international initiatives of collaboration and leadership of cities in the fight against Climate Change since the first meetings that gave rise to the creation of C40 network, in October 2005 in London, developing since then and continuously developing activity in the prevention and fight against climate change. It is worth mentioning some milestones such as the approval by the Municipal Plenary of the adhesion to the Covenant of Mayors (Covenant of Mayors[2]), in November 2008, obliging it to exceed the target set by the European Union (EU) to reduce GHG emissions by 20% by 2020. Subsequently, in July 2014, the Plenary agreed to approve the adhesion of Madrid City Council to the Mayors Adapt initiative (Mayors Adapt[3]). In September 2014, the Compact of Mayors initiative[4] was presented at the United Nations Climate Summit, to which the city of Madrid adhered, with the aim of committing cities to reduce their GHG emissions, making public their plans and objectives for mitigation and adaptation to climate change, as well as their annual monitoring, using a common methodology for the inventory of emissions at the urban scale. Subsequently, in 2018, Madrid City Council adheres to the 'Deadline 2020[5] ' commitment promoted by the Cities Climate Change Leadership Network - C40, by which it commits to develop an action plan.

In this last legislature, climate action has been intensified to respond to the urgent need to face this global challenge and to align municipal strategies with the context of European policies in this area. Among various commitments made by Madrid City Council, we highlight the adoption, by the Plenary in September 2019, of the Declaration of Climate Emergency and the active involvement of our city as the venue for COP25. Also in 2019, the city of Madrid presented the Environmental Sustainability

[2] https://eu-mayors.ec.europa.eu/en/home
[3] https://climate-adapt.eea.europa.eu/en/metadata/portals/mayors-adapt-the-covenant-of-mayors-initiative-on-adaptation-to-climate-change
[4] https://www.uclg.org/es/node/23789
[5] https://www.c40.org/wp-content/uploads/2021/07/Deadline_2020.pdf

Strategy Madrid 360[6] , drawn up with the aim of combating climate change and complying with the air quality limits established by European Union legislation and the recommendations of the World Health Organisation, a target achieved by 2022. The Strategy is comprehensive in nature, covering all emission sources and all districts of the city, improving air quality through three pillars of transformation: the city, mobility and government. In 2020, the Municipal Plenary approved membership of the Climate-KIC community of the European Institute of Innovation and Technology, which incorporates the systemic vision and the need to establish a multi-actor collaboration in Madrid as a demonstrator city of the Deep Demo programme "Healthy, clean cities", principles that will later be reflected in the concept of the Mission of Cities. In Acuerdos de la Villa, approved unanimously by all political parties of the municipal corporation and aimed at reactivating Madrid after the effects of the pandemic, the need to develop a climate action roadmap is included. As a result of this unanimous agreement and within the framework of the Madrid 360 Strategy, the 'Roadmap to climate neutrality by 2050' was drawn up[7] , which was officially presented by the Mayor in March 2021.

The Roadmap to Climate Neutrality is a technical analysis to support political commitment to action on Climate Change. The Roadmap aligns municipal policies with national and European policies, and raises the ambition required for cities that want to be at the forefront of this global movement. The Roadmap sets the goal of reducing Greenhouse Gases (GHGs) by 65% by 2030 (compared to 1990 levels), and achieving climate neutrality by 2050, as well as increasing city resilience to climate risks. This complex challenge cannot be addressed by acting on emission sources alone. It requires a social transformation and a paradigm shift in the way we build, govern and inhabit a city. Incorporating collaboration between administrations and internal interdepartmental coordination through a "Clima group", as well as establishing the basis for collaborative and social participation of multiple actors, are key factors in unlocking a true and profound transformation.

In this sense, **the European Climate Neutral and Smart Cities Mission** represents a unique opportunity for the city of Madrid in its objective to accelerate its decarbonisation, identifying three main motivations:

[6] https://www.madrid360.es/

[7] https://www.madrid.es/UnidadesDescentralizadas/Sostenibilidad/EspeInf/EnergiayCC/06Divulgaci%C3%B3n/6cDocumentacion/6cNHRNeutral/Ficheros/RoadmapENG2022.pdf

1. The concept of "Mission" provides an inspirational cohesive force towards transformational change that can be adopted by public bodies, large corporations and SMEs alike, academia, as well as each and every citizen.
2. The Mission constitutes a larger framework than the usual local project cycles in terms of time and scale, necessary to address complex challenges involving systemic change in a large city.
3. The Mission provides innovative tools such as climate city contracts, financing schemes and communication elements, offering a whole set of resources to articulate a new way of doing things for climate policy development.

These three factors **- commitment, joint learning and new planning and implementation tools -** will form a solid basis for increasing climate ambition towards neutrality by 2030 on an honest and credible pathway.

Finally, it is important to highlight that the City of Madrid is working to combine existing assets to put in place a strategic process, guided by the ambitious objectives of the Roadmap to Climate Neutrality, in conjunction with the other policies, strategies and regulations that can be found in the climate action plan of this Climate City Contract, reflected in table A-2.1 of Annex I.

Also noteworthy is the city's participation in the **National Platform of Spanish cities for climate neutrality CitiES2030**, a project promoted by the Ministry for Ecological Transition and the Demographic Challenge through the Biodiversity Foundation, as well as in the European network NetZeroCities (NZC) and the work on a portfolio of transformative projects connected to climate mitigation and adaptation actions.

This **Climate City Contract is a living and evolving document** that seeks to establish the main objectives, priorities and key principles for achieving climate neutrality in the city of Madrid. In this way, it maintains the city's commitment to continue working and improving the plans and actions already underway.

Climate neutrality target for 2030

The targets committed by Madrid City Council in the Roadmap towards climate neutrality are to reduce Greenhouse Gases (GHG) by 65% by 2030 (compared to 1990 levels), and to achieve climate neutrality by 2050. Being chosen as a "Mission" city by the European Commission is an important boost to accelerate the transformation process and achieve these goals ahead of the time initially set for the city as a whole, through the creation of areas and environments where climate neutrality will be a reality by 2030. In addition, the Roadmap to Climate Neutrality envisages an even more ambitious "extended scenario" in its reduction targets for 2030 whose technical, economic and social feasibility would only be possible with a Climate City Contract that puts in place innovative transformative tools and mechanisms. This Climate City Contract initiates avenues to explore how such an 'extended scenario' could be developed, so that the city can set more ambitious targets on the decarbonisation of its systems.

Madrid's vision towards climate neutrality in the context of the Mission focuses on the social dimension as the main driver of change, creating large areas with specific geographical boundaries where all sectors and systems have been transformed and where neutrality can be perceived as a lived experience. In this sense, the Mission provides the necessary systemic approach of actions coming together at one level and strengthens the character of equity and social inclusion by prioritising the concept of achieving the goals of neutrality by and for citizens.

The city of Madrid has a surface area of 60,445.5 hectares and 3,286,662 inhabitants (as of 1 January 2022), which is equivalent to an average density of 54 inhabitants per hectare, making it the most populated city of all the cities participating in this European initiative. Due to the size and complexity of our city, the Mission is approached at three levels of intervention with specific actions on environments that, although they have a delimited geographical scope, have special characteristics that extend their potential impact to the whole of the municipality:

+ **New climate-neutral urban developments.** A new way of making the city of the future by integrating climate innovation into urban design and management.

+ **Generation of a new culture of citizens of the future** through intervention in educational centres and zero-emission university campuses, which will attract talent and enable progress towards a society with greater knowledge and commitment in the face of this global challenge.

+ **A network of facilities and public space** that act as climate-neutral nodes for the transformation and regeneration of the consolidated city, promoting a shift towards a more natural, more cohesive city with a higher quality of life.

Annually, Madrid City Council publishes the 'Inventory of greenhouse gas emissions[8] ' which allows monitoring the evolution of emissions on the path towards neutrality. Although the trend in recent years is clearly downward, it is necessary to accelerate the pace of emissions abatement to meet the targets set by the city and to complement the strategies in place with innovative approaches to the development of climate action.

Climate impacts are becoming increasingly complex due to the interaction and cascading effects of multiple extreme events. Accelerating climate change mitigation and adaptation plans and measures in the city of Madrid will ensure the health of citizens, as well as the transition to more sustainable lifestyles, improving living conditions while strengthening economic activity.

The path towards neutrality implies an evolution of many of the current urban models and a social and economic transformation. In this process, the importance of co-benefits associated with climate change mitigation and adaptation actions should be highlighted. In addition to the reduction of climate impacts, there are the multiple benefits they provide, from the improvement of air quality, the protection of ecosystems and urban biodiversity, the functionality of public spaces, the stimulation of local economies and green employment, as well as benefits associated with a reduction of costs in the management of water, energy, waste, risk insurance, among a host of other effects.

8 https://www.madrid.es/UnidadesDescentralizadas/Sostenibilidad/EspeInf/EnergiayCC/04CambioClimatico/4aInventario/Ficheros/GHGemissions_2020_acc.pdf

Strategic priorities and interventions

The City of Madrid approaches the Mission with a systemic vision of the whole city and with three priority strategic interventions:

+ **New climate-neutral city developments** - The main exponent already underway is the Madrid Nuevo Norte area, with the vision of becoming the largest urban development with an electrified energy model (zero emissions) in Europe, and whose experience is transferable to other urban areas and nodes of economic activity. This urban regeneration project (3.3 km^2) proposes a new form of urban planning that integrates climate innovation in terms of technology and nature-based solutions from the design phase and within a strong public-private partnership. With the Mission's support, the experience could be extended to other urban projects.

+ **New culture for the citizens of the future, through** the intervention in university campuses and schools transformed into climate-neutral environments. Students are the ones who will shape cities as future prescribers, and the generation of talent and research capacity in the key aspects of the energy transition towards neutral models constitutes a strategic intervention of the first order. Madrid is home to the largest university population in Spain and is home to three large campuses (6.5 km^2) whose transformation has a significant direct impact. Strengthening the city-university binomial to foster new mindsets in all disciplines is a major driver of transformation in Mission Madrid.

+ **The transformation and regeneration of the consolidated city with facilities, public space and other public facilities,** acting as nodes of neutrality in which the action of the administration connects with other urban actors on the territory through actions such as energy communities, participatory design of environments, shared modes of mobility, etc., also integrating private partners in business districts and taking advantage of the momentum created by the Mission. A catalysed intervention from the City Council with multiple accelerated transformation centres spread across the city will drive neighbourhood regeneration and decarbonisation.

These strategic interventions are coherent with and integrated into the local climate action policy defined by the **Madrid 360 Environmental Sustainability Strategy** and the technical document of the **Roadmap towards climate neutrality of the city of Madrid** that derives from it. Furthermore, the whole of the Madrid Mission towards climate neutrality and, in particular, these interventions in which close collaboration between administrations is essential, have the backing of the Community of Madrid through the Decarbonisation and Environmental Care Plan and the forthcoming Energy, Climate and Air Strategy Horizon 2030. Mission Madrid cannot be understood in isolation from the regional context.

Systemic intervention in these areas of climate neutrality implies a paradigm shift in the way actions are addressed, moving away from the traditional sectoral approach and tackling current models holistically, focusing on changing patterns of use to reduce emissions at source. In this way, interventions are analysed with an 'Avoid-Change-Improve' philosophy:

+ **Avoiding emissions:** proximity urban planning, creation of low-emission areas of special protection, rehabilitation and energy efficiency, reduction of forced travel, waste minimisation, among others.

+ **Shifting to less polluting options and solutions**: such as electrification of energy demand in different sectors, boosting active mobility by expanding the cycling and pedestrian network, or promoting the use of zero-emission public transport.

+ **Improve through technological development to minimise the impact of the solutions adopted:** decarbonisation of the electricity system through renewable sources distributed within the municipality or improving and electrifying the vehicle fleet.

This perspective is embodied in **transformative projects that cut across different sectors and levers of change**. These projects, which are integrated into the climate neutrality action plan, connect usually isolated visions and disciplines, catalysing a transformation of the entire field.

This requires an unprecedented effort to **work collaboratively with multiple stakeholders** to connect the interests and motivators of citizens, the private sector, academia and administrations in the city of Madrid.

Principles and process

The city of Madrid has established key principles that guide its Roadmap towards climate neutrality and reinforce its role as a model of experimentation and innovation:

+ **Climate governance**. On the basis of a solid political mandate that makes climate neutrality a priority "city project" and transversal to all municipal actions, a process of revision and updating of regulations and administrative tools (urban planning regulations, tax ordinances, environmental ordinances, price tables, contracting instructions, etc.) has been initiated to create a regulatory environment favourable to the achievement of the objectives of neutrality and adaptation. Thus, for example, the new Air Quality and Sustainability Ordinance (2021) creates the figure of Climate Action Demonstration Areas, in which measures will be intensified to advance climate neutrality objectives, with the environments selected by the Madrid Mission (Madrid Nuevo Norte and University Campuses) being the first targets. The appropriate coordination of climate action in the set of municipal policies is structured through an interdepartmental "Climate" Knowledge Community, composed of senior officials from different areas of the city government, such as Culture, Urban Planning, Economy and Innovation, Internationalisation, Finance and Human Resources, led by the Environment and Mobility Area, in which there is a specific unit (SG Energy and Climate Change) with dedicated technical staff. This knowledge community, supported by a specific programme of the Municipal Training School, provides not only a space for collaboration, but also for reflection and learning.

+ **Innovative monitoring and transparency**. Madrid is developing the ‘e-Mission’ tool for advanced diagnosis, simulation and evaluation of GHG emission source scenarios in the city. This platform complements the emissions inventory by providing information on GHG emissions with greater territorial granularity (scale of the 131 neighbourhoods into which the municipality of Madrid is

divided) and over time (quarterly updates) from the main sources of emissions in the city (mobility, residential sector and services). This facilitates the evaluation and simulation of the impact of municipal actions with a greater degree of detail and the comparative territorial analysis of emission trends. It is an innovative tool with an open interface for citizens to monitor Madrid's Mission towards climate neutrality. In addition, for the Climate Action Demonstrator Areas, "digital twins" will be generated in collaboration with the Digital Office of the City Council and private actors, with the aim of digitising the main energy flows and generating new avenues of collaboration in the development of citizen science initiatives associated with the real experience of neutral environments.

+ **Participation and social dimension.** Madrid faces the challenge of climate neutrality as an eminently social challenge, as it is not technology but people with their actions and decisions that can bring about a transformation with the scale and urgency required. An exclusively technological vision can increase social and territorial inequalities, generating a "climate divide" that prevents certain social sectors from accessing low-emission urban solutions and systems. To guarantee the equity and inclusiveness of climate action, the Mission Madrid process incorporates a work scheme based on processes of approaching and listening to the social reality through joint work with the districts, channels of participation for the different projects driving neutrality and collaboration with entities specialised in social action (Red Cross, Oxfam, Porticus, EAPN, Cáritas). On the other hand, and with regard to the variable of adaptation to the effects of climate change, which is closely linked to the Mission of neutrality, the consideration of groups with special vulnerability to, for example, increased temperatures and heat waves, plays an important role in the risk assessment measures and action plans.

+ **Talent.** The city of Madrid has the ambition to become a knowledge and learning hub for climate action and has already gained valuable experience, generating a university-city binomial through collaborations with the Academy (Climate-KIC Deep DEMO). As activation tools, Madrid has proposed priority intervention on zero-emission university campuses, to generate environments where climate neutrality can be experienced first-hand, and a programme for the creation of Climate Innovation Mission Chairs to accompany this process towards campus neutrality. The role of the university is not limited to scientific-

technical innovation, but also includes social innovation actions in which the student community, in their role as citizens-prescribers of the future, connect and activate the processes of communication, awareness and citizen involvement.

+ **Networking.** The city of Madrid has always made clear its conviction that it is essential to learn from each other if we want to go far and go fast as circumstances demand. Based on existing alliances, agreements and public-private collaboration spaces that link companies, public institutions and society (e.g. Madrid Futuro, energy companies, Foro de Empresas por Madrid, etc.), the creation of a Local Climate Action Platform with companies, social agents and other relevant urban actors is proposed in order to bring together commitments and projects that generate synergies in the city in a rigorous and verifiable way. Furthermore, the global and complex dimension of the climate crisis requires that this networking should not be limited to the local sphere, and it is essential to connect with other cities to share knowledge and experience. In this sense, Madrid is part of the "Collaboration Platform for the Climate Neutrality of Spanish Cities" (citiES 2030) promoted by the Ministry for Ecological Transition and the Demographic Challenge, and has extensive experience in international initiatives such as the C40 Cities Leadership Group, the Covenant of Mayors for Climate and Energy or the Eurocities network, as well as participation in European research, technological development, demonstration and innovation projects.

Government of Spain's support for climate neutrality in Mission cities

Through the **Declaration signed by the Third Vice-President of the Government and Minister for Ecological Transition and the Demographic Challenge**, which is annexed to this document, the Government of Spain expresses its commitment to the transformation process of the city selected by the European Commission on 28 April 2022 to participate in the European Cities Mission.

Support of the Autonomous Community of Madrid for the climate neutrality of the city of Madrid

For its part, the Government of the **Autonomous Community of Madrid,** as a key player in the multilevel governance necessary to achieve the goal of a climate neutral, inclusive, safe, resilient and sustainable city, has demonstrated its ambition in the transition towards climate neutrality in the region through the Decarbonisation and Environmental Care Plan and the forthcoming Energy, Climate and Air Strategy Horizon 2030.

Mission Madrid cannot be understood in isolation from the regional context. The support and specific commitments of the Autonomous Community towards the climate neutrality of the city of Madrid is reflected in the joint action on the portfolio of transformative projects that require this multi-level coordination, such as Madrid Nuevo Norte, as an example of urban development with zero direct emissions, urban-peri-urban mobility strategies or the generation of green infrastructure to bring nature closer to citizens by connecting Regional Parks and other natural spaces to the urban core to promote, conserve and protect biodiversity.

Monitoring, updating and amending the Climate City Contract and its Annexes

This document and its Annexes, which form an integral part of it, are configured in the framework of an **iterative process, as a dynamic and flexible document that will be subject to monitoring, updating and modification in order** to review and adjust the commitments, actions and/or investments necessary to achieve the City's climate neutrality objectives.

The signatories undertake to monitor, at least every two years, the progress of the commitments undertaken in this Climate City Contract and its Annexes and to update them accordingly. This monitoring and updating is without prejudice to the fact that specific monitoring, review and updating methodologies are set out in the different Annexes.

When necessary for the better achievement of its objective, when it does not affect its essential purpose and whenever it involves a specification, improvement or upward revision of the objectives and commitments undertaken, the signatories may introduce modifications to it and/or to any of its Annexes. These modifications shall preferably be made within the framework of the biennial monitoring and shall be sent to the other signatories for information purposes.

José Luis Martínez-Almeida Navasqüés
Mayor of Madrid

Madrid

GOBIERNO DE ESPAÑA
VICEPRESIDENCIA TERCERA DEL GOBIERNO
MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO

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Supporting statement of National Government for the climate neutrality of Spanish Mission Cities

I hereby place on record the Spanish Government's commitment to support the climate city contracts presented by the cities, which were selected by the European Commission on 28 April 2022 to participate in the European Cities Mission: Madrid, Barcelona, Sevilla, Valencia, Zaragoza, Valladolid and Vitoria-Gasteiz.

This support contributes to the ecological and energy transformation of cities and to a greater climate and social resilience, which is materialised in the Spanish State's framework of competences, among others, in the following aspects:

1. **The impulse of a regulatory framework aligned with the systemic innovation and public-private collaboration** required by the European Mission of Cities. In this context, it highlights:

    + The Spanish Urban Agenda, approved in February 2019, which highlights the need to achieve sustainability in urban development policies. It is constituted as a working method and a process for all the actors involved in cities that aspire to an equitable, fair and sustainable development from the different fields of action. This strategy is developed around 30 specific objectives and 291 action lines, which includes all villages and cities regardless of size and population, and it addresses economic, social and environmental sustainability.

    + Law 7/2021, of 20 May, on climate change and energy transition. This institutional framework guarantees, through its various measures, the coordination of sectoral policies, ensures coherence between them and synergies to achieve the objective of climate neutrality, and increases our capacity to adapt to the adverse effects of climate change.

The work commitment on the regulatory developments of the Law is clear. Due to the implications for the European Mission Cities, the following stand out: (i) in the energy field, work is being done to establish a framework to deploy energy efficiency in industries and buildings, and renewable energies as vectors towards decarbonisation, (ii) in terms of emission-free mobility, the mandate for cities to adopt sustainable urban mobility plans with mitigation measures, such as low-emission zones, is included, iii) in the area of green procurement, we are working to establish measures to integrate the fight against climate change in public procurement procedures, such as the inclusion of emission reduction and carbon footprint criteria specifically aimed at the fight against climate change as specific technical requirements in procurement specifications.

2. **The launch of the Multi-stakeholder Collaboration Platform for the Climate Neutrality of Spanish Cities (citiES 2030),** a tool created *ad hoc* and already in operation to facilitate the implementation of the Cities Mission.

   With the implementation of this platform, the Government of Spain not only fulfils one of the initial activities of the Mission, but also becomes a reference for the other countries and cities in the programme.

   This platform is a multi-stakeholder innovation and collaboration infrastructure to support and accelerate the transformation of Spanish cities towards climate neutrality.

   The platform's main beneficiaries are city councils of Spanish cities with more than 50,000 inhabitants or provincial capitals that want to achieve full or partial climate neutrality by 2030, as well as cities with more than 20,000 inhabitants that want to initiate this process.

   The platform offers cities a range of services, including:

   + Training, learning and skills enhancement

+ The support for the development of local systemic innovation platforms for the design of transformative project portfolios;

+ The assistance in drafting and monitoring climate city contracts and the design of roadmaps in a multi-stakeholder environment;

+ The connection with related processes in other European cities; the incubation of multi-city projects; the citizen participation and activation;

+ The assistance to cities to structure transformation financing schemes, involving financial actors;

+ The strategic communication.

The Platform's governance is multi-stakeholder and multi-level, with the aim of facilitating, ordering and guaranteeing directionality and stability in these collaborations. In this way, it relies on the participation of the actors of the quintuple helix:

+ The public sector (administrations and public agencies).

+ The private sector (companies, financial sector, urban infrastructure sector and professional associations).

+ The academia (universities and research centres).

+ The civil society (NGOs and neighbourhood associations).

+ The media.

3. **The support to mobilisation of green investments.** A good example is the deployment of the Recovery, Transformation and Resilience Plan through the mobilisation of an unprecedented volume of investment that prioritises not only mitigating the effects of the crisis, but also the transformation of our country towards a sustainable and inclusive economy.

   The Recovery Plan recognises the fundamental role of cities in economic and social transformation, due to their capacity to generate short-term activity with a pull effect on industry and key sectors, and their importance in terms of the climate emergency. Thus, it includes initiatives aimed at essential aspects for the climate neutrality of cities, such as:

   + The improvement of sustainable mobility, with the promotion of electric and fuel cell vehicles and the extension of recharging infrastructures, through the different MOVES programmes.

   + The promotion of the renovation of urban residential environments, housing, buildings and neighbourhoods, with the priority objective of decreasing energy consumption and promoting decarbonisation in the household stock.

   + The development of energy communities that promote social innovation and citizen participation in renewables, energy efficiency and electric mobility, thereby contributing to fair and inclusive decarbonisation in urban areas.

   + The promotion of self-consumption for the energy use of urban roofs and decks, storage behind the meter and renewable HVAC in homes.

   + The development of transformative strategies and initiatives for urban renaturalisation, helping to increase green infrastructure and biodiversity in Spanish cities and favouring Nature-Based Solutions to respond to their socio-environmental challenges.

   + The support for the implementation of waste regulation, in collaboration with the autonomous communities and cities, with investments in

digitalisation for environmental management, through the Recovery Plan.

+ The deployment of calls for grants to municipalities and local entities for the implementation of low-emission zones in cities and the sustainable and digital transformation of urban transport.

4. **The monitoring of the progress of the seven cities through the information processed in the citiES 2030 Platform**, with the aim of integrating the urban transformation roadmap into the country's decarbonisation process.

As part of the iterative process of the European Cities Mission, the Spanish Government will participate in the monitoring and updating of the commitments made in the climate neutrality agreements of the cities of Barcelona, Madrid, Sevilla, Valencia, Valladolid, Vitoria-Gasteiz and Zaragoza, supporting the recognition and dissemination of the progress achieved.

Signed by Teresa Ribera Rodríguez, Third Vice-President of the Government of Spain and Minister for Ecological Transition and Demographic Challenge

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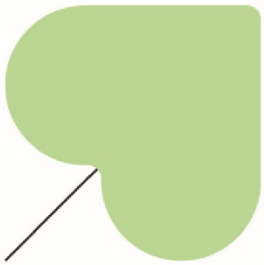

ANNEX 1:
Climate Neutrality Action Plan

Introduction

The introduction should describe the local policy context in which the Action Plan is being developed and describe the gaps it addresses in general terms.

Madrid has shown its commitment and involvement in international initiatives of collaboration and leadership of cities in the policies of Climate Change since the first meetings that gave rise to the creation of C40 network, in October 2005 in London, since then continuously developing activity in the prevention and fight against climate change. It is worth mentioning some milestones such as the approval by the Municipal Plenary of the adhesion to the Covenant of Mayors in November 2008, obliging it to exceed the target set by the European Union (EU) to reduce GHG emissions by 20% by 2020. Subsequently, in July 2014, the Plenary agreed to approve the adhesion of Madrid City Council to the "Mayors Adapt" initiative. In September 2014, the *Compact of Mayors* initiative was presented at the United Nations Climate Summit, to which the city of Madrid adhered, with the aim of committing cities to reduce their GHG emissions, making public their plans and targets for mitigation and adaptation to climate change, as well as their annual monitoring, using a common methodology for an inventory of GHG emissions at urban scale. Subsequently, in 2018, Madrid City Council adheres to the *'Deadline 2020'* commitment promoted by the Climate Change Leadership Network - C40, by which it commits to develop an action plan.

In this last legislature, climate action has been intensified to respond to the urgent need to face this global challenge and to align municipal strategies with the context of European policies in this area. Among various commitments made by Madrid City Council, we highlight the adoption, by the Plenary in September 2019, of the Declaration of Climate Emergency and the active involvement of our city as the venue for COP25. Also in 2019, the city of Madrid presented the **Environmental Sustainability Strategy Madrid 360**[1] , drawn up with the aim of combating climate change and complying with the air quality limits established by European Union legislation and the recommendations of the World Health Organisation, a target achieved by 2022. The Strategy is comprehensive in nature, covering all sources of emissions and all districts of the city, improving air quality through three pillars of transformation: the city, mobility and government. In 2020, the Municipal Plenary approved membership of the Climate-KIC community of the European Institute of Innovation and Technology, which incorporates the systemic vision and the need to establish a multi-actor collaboration in Madrid as a demonstrator city of the Deep Demo programme "Healthy, clean cities", principles that will later be reflected in the concept of the 'Mission'. In the Acuerdos de la Villa, approved unanimously by all political parties of the municipal corporation and aimed at reactivating Madrid after the effects of the pandemic, the need to develop a climate action roadmap is included. As a result of this unanimous agreement and within the framework of the Madrid 360 Strategy, the '**Roadmap to climate neutrality by 2050'**[2] was drawn up and officially presented by the Mayor in March 2021.

[1] https://www.madrid360.es/

[2] https://www.madrid.es/portales/munimadrid/es/Inicio/Medio-ambiente/Hoja-de-Ruta-hacia-la-neutralidad-climatica-en-/?vgnextoid=7c1395b79fde7710VgnVCM2000001f4a900aRCRD&vgnextchannel=3edd31d3b28fe410VgnVCM1000000b205a0aRCRD

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The Roadmap to Climate Neutrality is a technical analysis to support political commitment to action on Climate Change. The Roadmap aligns municipal policies with national and European policies, and raises the ambition required for cities that want to be at the forefront of this global movement. The Roadmap sets a target of reducing Greenhouse Gases (GHGs) by 65% by 2030 (compared to 1990 levels), and achieving climate neutrality by 2050, as well as increasing the city's resilience to climate risks. This complex challenge cannot be addressed by acting on emission sources alone. It requires a social transformation and a paradigm shift in the way we build, govern and inhabit a city.

In addition, the Roadmap to Climate Neutrality envisages a more ambitious "extended scenario" in its reduction targets for 2030 which, with a Climate City Contract that puts in place innovative transformative tools and mechanisms, would enable its technical, economic and social feasibility. This Climate City Contract initiates avenues to explore how such an 'extended scenario' could be developed, so that the city can set more ambitious targets on the decarbonisation of its systems, relying on a distributed leadership from all city stakeholder, with a particular engagement of citizens, as a key actor for the urban transformation.

Some of the key factors for unlocking deep transformation are the incorporation of inter-administration collaboration and internal interdepartmental coordination through working groups, as well as the establishment of the basis for collaborative and social multi-stakeholder participation, with specific focus on citizen engagement and assuring a just transition (including vulnerable communities and leaving no one behind).

In terms of meeting emissions targets, Madrid has limited powers to manage and implement improvement actions at the city's airports, and technological advances to reduce emissions in aviation are slower than in other areas. Therefore, although we will maintain the calculation of emissions from SNAP 0805 (Non-Road Transport - Air Transport Sector) in our annual Emission Inventory, we will exclude all emissions from this sector from the outset.

However, we are already working with IBERIA, the main airline operating out of Madrid airport and other airport operators, to work on reducing emissions and implementing new policies. The airline has already shown support for the city of Madrid in its expression of interest in joining the Mission and in this Climate City Contract reiterates that support with a letter of support.

The path towards neutrality implies an evolution of many of the current urban models and a social and economic transformation. In this process, the importance of co-benefits associated with climate change mitigation and adaptation actions should be highlighted. In addition to the reduction of climate impacts, there are multiple benefits they provide, from the improvement of air quality, the protection of ecosystems and urban biodiversity, the functionality of public spaces, the stimulation of local economies, as well as benefits associated with a reduction of costs in the management of water, energy, waste, risk insurance, among a host of other effects.

This Climate City Contract must be a living and evolving document, so that key priorities and principles can be shaped by trend analysis to ensure climate neutrality in the city. Madrid faces the challenge of climate neutrality as an eminently social challenge as it is not technology but people with their actions and decisions that can bring about a transformation with the scale and

urgency required. An exclusively technological vision can increase social and territorial inequalities, generating a "climate divide" that prevents certain social sectors from accessing low-emission urban solutions and systems. To guarantee the **equity and inclusiveness of climate action**, Mission Madrid process incorporates a work scheme based on processes of approaching and listening to the social reality working with the districts, also with channels of participation for the different projects driving neutrality and through collaboration with entities specialised in social action (Red Cross, Oxfam, Porticus, EAPN, Caritas, among others) that need to be promoted.

Work process

This section should list the actions undertaken or planned, as well as outline the timetable and milestones for future iterations for the continued development of the Action Plan.

The City of Madrid approaches the Mission with a systemic vision of the whole city and with three priority strategic interventions:

- **New climate-neutral city developments** - The main exponent already underway is Madrid Nuevo Norte area, with the vision of becoming the largest urban development with an electrified energy model (zero emissions) in Europe, and whose experience is transferable to other urban areas and nodes of economic activity. This urban regeneration project (3.3 km2) proposes a new form of urban planning that integrates climate innovation in terms of technology and nature-based solutions from the design phase and within a strong public-private partnership. With the Mission's support, the experience could be extended to other urban projects.
- **New culture for the citizens of the future** through the intervention in university campuses and schools transformed into climate-neutral environments. Students are the ones who will shape cities as future prescribers and the generation of talent and research capacity in the key aspects of the energy transition towards neutral models constitutes a strategic intervention of the first order. Madrid is home to the largest university population in Spain and has three large campuses (6.5 km2) within its municipal boundaries, the transformation of which has a significant direct impact. Strengthening the city-university binomial to foster new mindsets in all disciplines is a major driver of transformation in Mission Madrid.
  To this end, Madrid is already working on a pilot project around Campus Sur of the Technical University of Madrid (UPM) on the promotion of a new mobility model focused on active mobility, cycling and pedestrian network, as the beginning of the transformation of a zero-emissions campus. In this way, the project will work with the educational community, faculty and students to learn about their vision and enrich the project with their experiences as users of the campus. In addition, there is a secondary school and a special education centre in the area, which will also be included in the participation process.
- The transformation and regeneration of the consolidated city with **facilities, public space, and other public facilities** acting as nodes of neutrality in which the action of the

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administration connects with other urban actors on the territory through actions such as energy communities, participatory design of environments, shared modes of mobility, etc., also integrating private partners in business districts and taking advantage of the momentum created by the Mission. An intervention catalysed by the City Council with multiple accelerated transformation centres spread across the city will drive neighbourhood regeneration and decarbonisation.

These strategic interventions are coherent with and integrated into the local climate action policy defined by the Madrid 360 Environmental Sustainability Strategy and the technical document of the Roadmap towards climate neutrality for the city of Madrid that derives from it.

After signing this Climate City Contract, it is expected that the city will be able to work on establishing a local platform that involves all the actors present in the city (academia, private sector, citizens and other public administrations) through which synergies and collaborative projects can be found to work on the decarbonisation of the city. With the progress of this platform it will be possible to complete the first iteration of this document in a way that adjusts and aligns the levers and measures established here.
In addition, we have recently noticed about the selection of the project 'Multi-stakeholder innovative & systemic solutions for urban regeneration: Spain' in which Madrid participates within the Mission's Pilots call. This project consolidates the framework to initiate in 2023 the lines of work related to new energy and regeneration models through a collaborative model between the seven Spanish cities participating in the Mission.

Apart from that, in April 2022 the update of the 'Roadmap towards climate neutrality in the city of Madrid' was published, which established, among other things, the definition of a series of indicators that will allow us to track and monitor the levers and measures. An analysis of these indicators is carried out annually and a report is produced showing the results and trends. Based on these results, it is expected that the actions and measures established can be adapted to ensure their effectiveness.

In the course of this first iteration of the Climate City Contract, it is also expected that this 'Roadmap' can be updated in a way that seeks to integrate the social character in each lever and measure with the aim of ensuring equity and inclusiveness. A working group has been set up with the participation of social organisations such as Oxfam, Save the Children, Porticus, EAPN, Fuhem, among others, with the aim of reviewing the Roadmap from a social perspective, learning from their experience and work and connecting initiatives that multiply the inclusive transformation of the city. This group will work for a year to address the review but will have continuity through specific projects to ensure a just transition.

PART A - CURRENT STATE OF CLIMATE ACTION

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This module contains the city's starting point towards climate neutrality and informs subsequent modules and outlined pathways to accelerate climate action.

MODULE A-1

Greenhouse Gas Emissions Baseline Inventory

Detail and describe the latest GHG inventory of the city to establish the baseline emissions and to establish the emissions gap towards climate neutrality in 2030 (according to the inventory format established by the Mission Briefing Kit and the process described in the Action Plan Guidance).

Since 1999, Madrid City Council has been carrying out an annual inventory of pollutant and greenhouse gas emissions into the atmosphere, following the EMEP/CORINAIR methodology, a project coordinated by the European Environment Agency, which integrates the inventories of practically all European countries, and which meets the requirements established by the Intergovernmental Panel on Climate Change (IPCC) and the Working Group on Atmospheric Emission Inventories and Projections of the United Nations Economic Commission for Europe.
This inventory is a fundamental instrument for the definition and monitoring of municipal policies and plans relating to climate change and air quality, as it establishes the basis for the cost-benefit analysis of emission reduction measures and the definition of measures to minimise pollution load.

Also, as part of the EIT Climate-KIC Deep Demonstration programme carried out in Madrid in 2020 as a demonstration city, an economic model was developed to identify the most profitable decarbonisation strategies for the city. This model developed by Material Economics has served as the basis for the development of a common tool for the seven cities of the Spanish Platform for Climate Neutrality, citiES2030. Adapted in order to be used to complete different tables of the Climate Climate City Contract, this model uses a life-cycle approach to assess the economic viability of different decarbonisation strategies. This means that not only upfront costs are taken into account, but also the recurring costs and benefits of each option over its entire lifetime. In addition, the model takes into account the various costs associated with decarbonisation, such as the cost of renewable energy deployment, the cost of energy efficiency measures and the cost of changes in transport systems, among others.

The economic model for decarbonising cities is a useful tool for cities to develop strategies to reduce their emissions. By combining the emissions inventory with the costs and benefits provided by the Economic Model associated with different decarbonisation actions and strategies, the city can develop a comprehensive understanding of its emissions profile and identify the most cost-effective and efficient ways to reduce its carbon footprint.

Both the economic model and the emissions inventory aim to provide the information to develop effective strategies and actions to reduce GHG emissions and improve energy efficiency. While they

use different approaches for calculating emissions, both tools are useful for making the transition to a sustainable, low-carbon future.

Thus, although both instruments share certain similarities, the Economic Model and the emissions inventory estimate GHG emissions differently. These different approaches in calculating emissions result in a different quantification of the city's emissions between the two calculation methodologies. Although the final results are similar, the different approaches of the two methodologies result in two different emission inventories.

The Economic Model uses a "systems" approach to account for GHG emissions in cities. It looks at the entire urban system, including Buildings and Heating and Cooling, transport, electricity and waste, and identifies emission sources and pathways. The model takes into account not only Scope 1 emissions (such as from combustion in boilers, furnaces, vehicles, etc.), but also Scope 2 emissions (i.e. emissions from the generation of electricity purchased and consumed) and some Scope 3 emissions (from waste management, where this takes place outside the boundaries of the municipality).

Another difference between the two approaches is the level of detail. The Economic Model provides a complete picture of the urban system and how emissions are generated and flow through it. The Emission Inventory focuses more on specific sectors and follows a standardised format, which makes it easier to compare emissions between cities.

The Economic Model uses a Business as Usual 2030 scenario (BAU 2030) as a reference to estimate the potential emission reductions that can be achieved through different decarbonisation strategies and actions. This scenario represents a projection of what the city's emissions trajectory would look like if no additional decarbonisation measures beyond those already planned or underway were implemented. The BAU 2030 scenario provides a baseline against which to compare the cost-effectiveness of different decarbonisation strategies and actions. By comparing the costs and benefits of different decarbonisation pathways with the BAU 2030 scenario, the model can estimate the potential ROI (Return on Investment) of each strategy and action.

By considering the potential ROI of different decarbonisation strategies and actions, the Economic Model can help identify the most cost-effective pathways to achieve its emission reduction targets by ensuring that limited resources are allocated to strategies and actions that provide maximum value for the city and its residents.

In order to develop a comprehensive understanding of the city's emissions profile and identify the most cost-effective and efficient ways to reduce GHG emissions, Madrid Climate City Contract makes extensive use of the emissions data provided by the Economic Model, so that the investments, costs and benefits presented in the model are consistent with the emissions resulting from the model. Furthermore, and given that the emissions inventory represents the starting point for the emissions calculation of the economic model, it has been considered appropriate to include the **first three tables** of Annex I (Climate Action Plan) to present the **emissions inventory** data of the Madrid City Council. These are: A-1.1, A-1.2 and A-1.3.

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In addition, table A-1.4 is used to present the emissions resulting from the two calculation methodologies used, the emission inventory calculation methodology and the methodology used by the Economic Model. The rest of the quantitative tables of the model from table A-2.3 present data provided by the Economic Model.

A-1.1: Final energy use by sector of origin → GHG Inventory 2019	
Base year	2019 (final energy consumption data according to the municipal energy balance, year 2019)
Unit	MWh/year
sector	**Final energy source**
Buildings and Services (including fuel consumption in agricultural/livestock station facilities)	**21.644.328**
Biomass	86.331
Natural gas	8.017.826
Petroleum products	2.148.599
Electricity	11.066.625
Coal	116.045
Solar thermal and geothermal	208.902
Industry (stationary combustion)	**2.192.345**
Natural gas	1.407.723
Petroleum products	71.885
Electricity	712.737
Road transport	**11.160.182**
Natural gas	661.973
Petroleum products	10.004.827
Biofuels	490.876
Electricity	2.506
Other modes of transport	**4.378.689**
Petroleum products	3.342.577
Electricity	1.036.112
Waste treatment	**77.617**
Petroleum products	1.366
Electricity	76.251
Wastewater treatment	**285.958**
Natural gas	146.538
Electricity	139.420

A-1.2: Emission factors applied - GHG Inventory 2019						
Emission factors from the emissions inventory of the Madrid City Council, year 2019. This inventory uses IPCC and EMEP/EEA as reference methodologies. In the case of being global emission factors characteristic of a sector as a whole, they have been obtained secondarily, as the quotient between the total emissions of the sector and the corresponding activity variable.						
Activity variable	Carbon dioxide (CO_2)	Methane (CH_4)	Nitrous oxide (N_2O)	Hydrofluorocarbons and Perfluorocarbons	Sulphur hexafluoride (SF_6)	Nitrogen trifluoride (NF_3)

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Electricity (t/MWh)	1,49E-01	9,17E-06	6,17E-06	-	-	-
Electricity (losses, t/MWh)	2,00E-02	1,23E-06	8,28E-07	-	-	-
Buildings and services (residential, commercial and institutional sector)						
Coal (t/GJ)	1,01E-01	1,00E-05	1,50E-06	-	-	-
Diesel (t/GJ)	7,41E-02	1,00E-05	6,00E-07	-	-	-
Natural gas (t/GJ)	5,61E-02	5,00E-06	1,00E-07	-	-	-
Butane (t/GJ)	6,30E-02	5,00E-06	1,00E-07	-	-	-
Propane (t/GJ)	6,30E-02	5,00E-06	1,00E-07	-	-	-
Biomass (t/GJ)	0,00E+00	3,00E-04	4,00E-06	-	-	-
Industry (stationary combustion)						
Natural gas (boilers, t/GJ)	5,60E-02	1,40E-06	9,00E-07	-	-	-
Diesel (t/GJ)	7,30E-02	1,70E-06	7,00E-07	-	-	-
Propane (t/GJ)	6,50E-02	9,00E-07	2,50E-06	-	-	-
Natural gas (turbines, t/GJ)	5,60E-02	4,00E-06	1,30E-06	-	-	-
Natural gas (engines, t/GJ)	5,60E-02	3,16E-04	1,30E-06	-	-	-
Diesel fuel (engines, t/GJ)	7,30E-02	1,50E-06	1,85E-06	-	-	-
Fuel oil (t/GJ)	7,60E-02	2,90E-06	1,75E-06	-	-	-
Diesel oil (cement plants, t/GJ)	7,30E-02	1,70E-06	1,50E-06	-	-	-
Road transport (t CO_{2eq} /km characteristic by vehicle sector)						
Cars	1,52E-04					
Buses	7,45E-04					
Light vehicles	2,08E-04					
Heavy vehicles	3,59E-04					
Waste treatment						
Diesel, comb. Aux. incineration (t/GJ)	7,30E-02	1,70E-06	1,50E-06	-	-	-
Municipal waste (all, t/t)	6,59E-01	1,00E-06	1,00E-04	-	-	-
Natural gas (landfill, t/GJ)	5,60E-02	3,16E-04	1,30E-06	-	-	-
Other biogas (landfill-antorcha, t/t CH_4 flared)	-	8,00E-03	9,00E-05	-	-	-
Other biogas (landfill-engine, t/t CH_4 flared)	-	2,80E-02	9,00E-05	-	-	-
Other biogas (anaerobic	-	8,00E-03	9,00E-05	-	-	-

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digestion-antorcha, t/t CH_4 flared)						
Other biogas (anaerobic digestion-engine, t/t CH_4 flared)	-	2,80E-02	9,00E-05	-	-	-
Natural gas (sludge drying-turbine, t/GJ)	5,60E-02	4,00E-06	1,30E-06	-	-	-
Natural gas (sludge drying-engine, t/GJ)	5,60E-02	3,16E-04	1,30E-06	-	-	-
Anaerobic digestion (t/kt)	-	1,00E-06	-	-	-	-
Incineration (t/body)	3,90E-02	8,00E-08	-	-	-	-
Composting (t/kt)	-	4,00E-06	3,00E-07	-	-	-
Other sectors → GHG Inventory 2019						
Gas distribution networks (t/Gt)	8,84E-04	2,24E-05	-	-	-	-
Fertilised crops (permanent, t/Ha)	-	-	1,99E-03	-	-	-
Fertilised crops (tillage, t/Ha)	-	-	2,47E-03	-	-	-
Non-fertilised crops (tillage, t/Ha)	-	-	1,30E-04	-	-	-
Stubble burning (vineyard, t/Ha)	-	-	3,19E-08	-	-	-
Stubble burning (olive groves, t/Ha)	-	-	5,19E-08	-	-	-
Livestock (dairy cattle, t/head)	-	4,00E-02	-	-	-	-
Livestock (other cattle, t/head)	-	2,85E-03	-	-	-	-
Livestock (fattening pigs, t/head)	-	5,69E-03	-	-	-	-
Livestock (breeding sows, t/head)	-	1,43E-02	-	-	-	-
Livestock (sheep, t/head)	-	1,90E-04	-	-	-	-
Livestock (horses, t/head)	-	3,33E-03	-	-	-	-
Livestock (laying hens, t/head)	-	2,04E-05	-	-	-	-

Livestock (broilers, t/head)	-	2,83E-05	-	-	-	-
Livestock (goats, t/head)	-	2,26E-04	-	-	-	-
Nitrogenous manure management (drained, t/t N excreted)	-	-	1,00E-06	-	-	-
Nitrogenous manure management (storage, t/t N excreted)	-	-	2,00E-05	-	-	-
Nitrogenous manure management (grazing, t/t N excreted)	-	-	2,00E-05	-	-	-
Nitrogenous manure management (other systems, t/t N excreted)	-	-	5,00E-06	-	-	-
Forest fires (t/Ha)	3,60	5,40E-02	1,60E-03	-	-	-
Aquatic spaces (t/Ha)	-	5,00E-02	-	-	-	-
Animals (t/individual*year)	-	1,00E-04	-	-	-	-

<table>
<tr><th colspan="4">A-1.3: Activities by sector of origin → GHG Inventory 2019</th></tr>
<tr><td colspan="2">Base year</td><td colspan="2">2019
(emissions considered in the current emissions inventory of the municipality of Madrid by scope and sector of activity)</td></tr>
<tr><td></td><td>Scope 1</td><td>Scope 2</td><td>Scope 3</td></tr>
<tr><td>Buildings and services</td><td rowspan="3">Emissions from stationary combustion in boilers, turbines, engines and similar installations</td><td rowspan="3">Emissions associated with electricity generation processes whose consumption takes place in the municipality of</td><td rowspan="3">Emissions associated with losses in the transport of electricity from the points of generation to the</td></tr>
<tr><td>Commercial and institutional</td></tr>
<tr><td>Residential</td></tr>
</table>

Agriculture, forestry, aquaculture		Madrid, and within this sector of activity.	points of final consumption.
Industry	Emissions from stationary combustion in industrial installations, such as boilers and furnaces, with or without direct contact between treated materials and flue gases	Emissions associated with electricity generation processes whose consumption takes place in the municipality of Madrid, and within this sector of activity.	Emissions associated with losses in the transport of electricity from the points of generation to the points of final consumption.
Non-specific industrial combustion			
Non-contact process furnaces			
Contact processes			
Road transport	Emissions related to combustion in the different modes of road transport, as well as those directly derived from them	Emissions associated with electricity generation processes whose consumption takes place in the municipality of Madrid, and within this sector of activity.	Emissions associated with losses in the transport of electricity from the points of generation to the points of final consumption.
Cars			
Light vehicles			
Heavy vehicles and buses			
Motorbikes and mopeds			
Evaporation of petrol from vehicles			
Tyre and brake wear			
Pavement abrasion			
Other modes of transport	Emissions from the movement of vehicles and machinery, excluding all emissions already included in road transport	Emissions associated with electricity generation processes whose consumption takes place in the municipality of Madrid, and within this sector of activity.	Emissions associated with losses in the transport of electricity from the points of generation to the points of final consumption.
Rail traffic			
Air traffic			
Mobile agricultural machinery			
Industrial mobile machinery			

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Gardening machinery			
Other			
Industrial processes and product use	Emissions from non-combustion industrial processes whose energy requirements are met by heat transfer from combustion processes. Also included are emissions from production and consumption processes involving the use of organic solvents, HFCs, PFCs, SF_6 , N_2 O or NH_3	-	-
Processes in the oil refining industry			
Processes in the iron and steel industry and in coking plants			
Processes in the non-ferrous metals industry			
Processes in the inorganic chemical industry			
Processes in the organic chemical industry			
Processes in the wood pulp, paper pulp, food, beverage and other sectors			
Halogenated hydrocarbons and sulphur hexafluoride production			
Paint application			
Dry cleaning, degreasing and electronic cleaning			
Manufacture or processing of chemicals			
Other solvent uses and related activities			

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Use of HFCs, PFCs, SF_6, N_2O and NH_3			
Agriculture, forestry and land use	Emissions from the development of agricultural and animal husbandry practices, as well as from the management and exploitation of forests and natural areas	-	-
Fertiliser crops			
Fertiliser-free crops			
Open field burning of stubble, straw...			
Livestock (enteric fermentation)			
Manure management with reference to organic compounds			
Manure management with reference to nitrogen compounds			
Forest fires			
Grassland and other vegetation			
Aquatic spaces			
Animals			
Managed hardwood forests			
Managed coniferous forests			
Changes in biomass stocks in forests and other woody biomass pools			
Waste treatment	Emissions from the various waste management operations	Emissions associated with electricity generation processes	Emissions associated with losses in the transport of electricity
Waste incineration			

Landfill		whose consumption takes place in the municipality of Madrid, and within this sector of activity.	from the points of generation to the points of final consumption.
Cremation			
Other waste treatment			
Other	Emissions associated with extraction, storage and distribution of fossil fuels and geothermal energy	Emissions associated with electricity generation processes whose consumption takes place in the municipality of Madrid, and within this sector of activity.	Emissions associated with losses in the transport of electricity from the points of generation to the points of final consumption.
Distribution of liquid fuels (except distribution of gasoline)			
Gasoline distribution			
Gas distribution networks			

A-1.4: GHG emissions by sector of origin → GHG Inventory 2019				
Base year	2019			
Unit	t CO_2 equivalent/year			
	Scope 1	**Scope 2**	**Scope 3**	**Total**
Buildings and Services (including fuel consumption in agricultural/livestock station facilities)	2.183.314	2.204.814	241.903	**4.630.031**
Industry	442.790	138.365	15.181	**596.336**
Road transport	2.590.753	500	55	**2.591.308**
Other modes of transport	864.039	206.551	22.662	**1.093.252**
Industrial processes and use of products (does not include combustion operations in industry, already included in "Industry")	358.809	-	-	**358.809**
Agriculture, forestry, aquaculture (without absorption)	13.347	-	-	**13.347**
Waste treatment	735.206	8.583	942	**744.731**
Other	19.807	-	-	**19.807**
Absorptions (CO sinks)$_2$	-39.598	-	-	**-39.598**
Total (without absorption)	**7.208.065**	**2.558.812**	**280.743**	**10.047.620**
Total (with absorptions)	**7.168.467**	**2.558.812**	**280.743**	**10.008.022**

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A-1.5: Charts and tables → GHG Inventory 2019

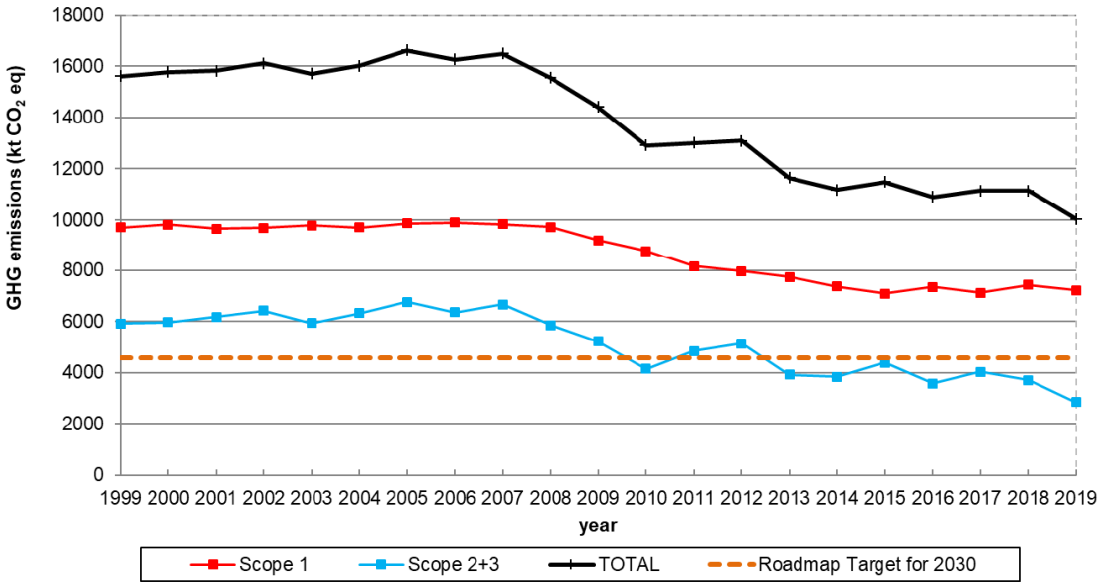

Figure 6. GHG emissions trends in Madrid city

Figure 1. Evolution of direct, indirect and total emissions

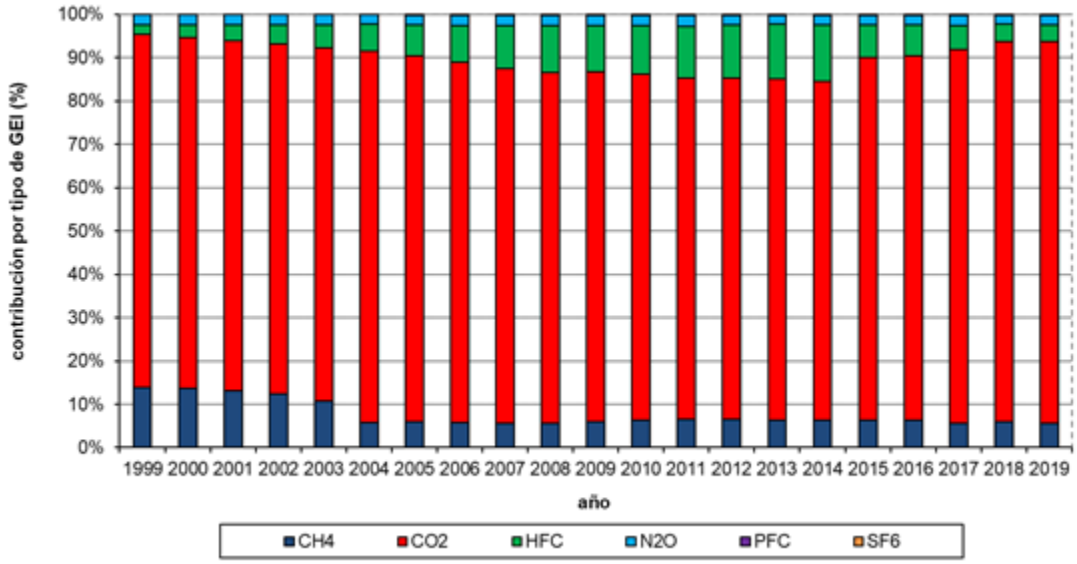

Figure 2. Evolution of the contribution of each GHG to direct emissions

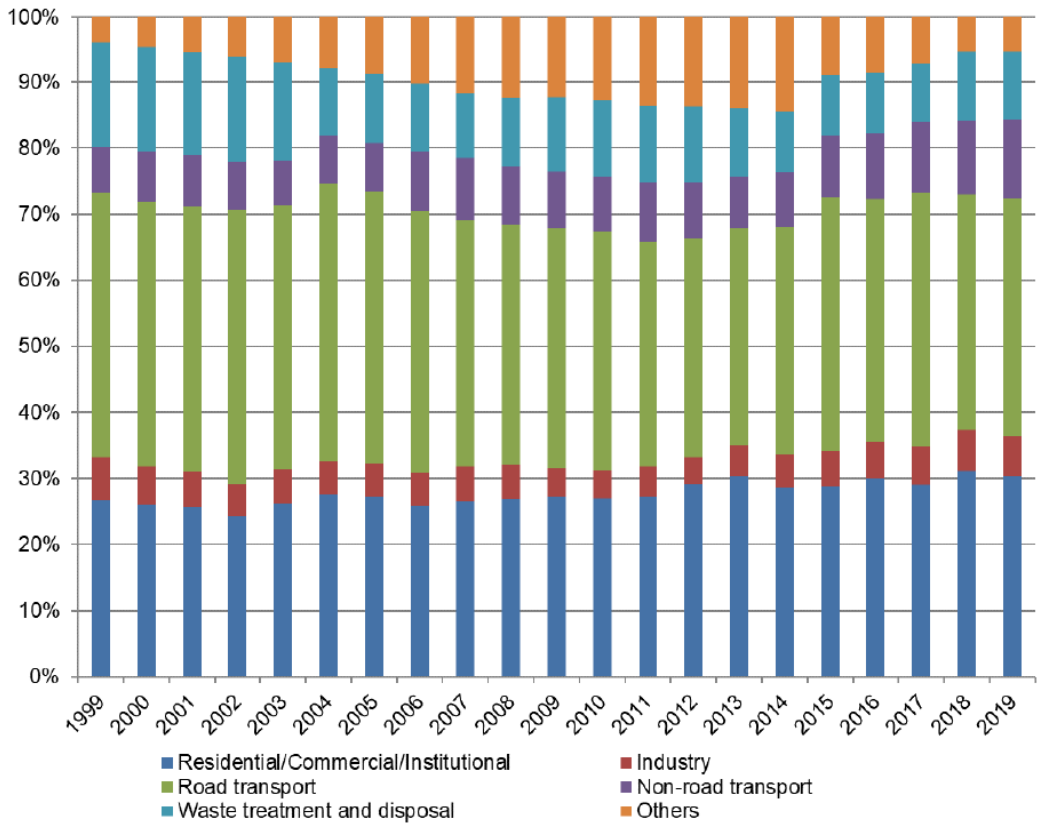

Figure 2. Scope 1 emissions breakdown by sector

Figure 3. Evolution of each sector's contribution to direct GHG emissions (Scope 1)

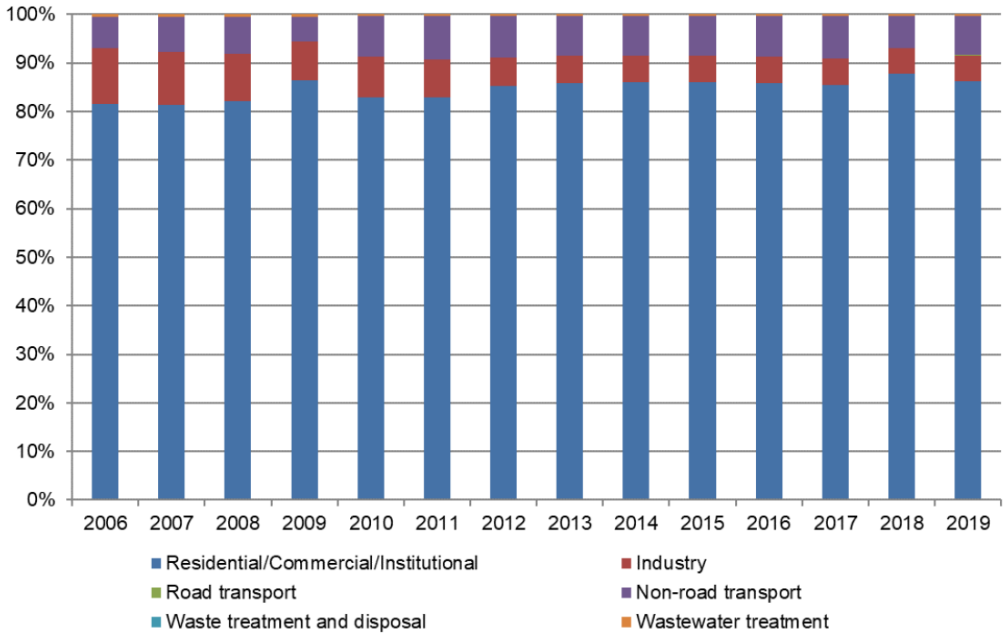

Figure 5. Scope 2+3 emissions breakdown by sector

Figure 4. Evolution of each sector's contribution to indirect GHG emissions

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A-1.6: Description and assessment of the baseline GHG inventory → GHG Inventory 2019

The figure shows the evolution of total direct and indirect greenhouse gas emissions over the entire inventory period 1999-2019, with a marked downward trend since 2005.

The second figure illustrates the evolution of the relevance of each compound in the direct emissions of the city of Madrid. As can be seen, carbon dioxide continues to be the most relevant pollutant, with an average contribution of 82% between 1999 and 2019. Methane and hydrofluorocarbons have seen their contribution decrease from values of 11-14% at their historical peaks to values of 4-6% in 2019.

The sectoral contribution to direct and indirect emissions can be seen in figures 3 and 4. In the case of direct emissions, the most significant differences are found in the road transport sector, whose contribution decreases from 40% in 1999 to 32% in 2019. On the other hand, the residential, commercial and institutional sector remains the sector with the highest contribution to indirect emissions.

Further details on the evolution of greenhouse gas emissions can be found in the inventory published annually on the Madrid City Council website: GHG Emission Inventory.

Below are the tables filled in with data specific to the **Economic Model**.

A-1.2: Emission factors applied (source: economic model input data)							
Base year	2019						
For calculation in t or MWh primary energy							
*Intergovernmental Panel on Climate Change (IPCC) principles, Covenant of Mayors for Climate and Energy methodology_ Methodology for calculating material economics: Emission=activity data*Emission Factor*							
Sector	**Primary energy/ source of energy**	**Carbon dioxide (CO_2)**	**Methane (CH_4)**	**Nitrous oxide (N_2O)**	**Hydrofluorocarbons and Perfluorocarbons**	**Sulphur hexafluoride (SF_6)**	**Nitrogen trifluoride (NF_3)**
Transport	Private Transport (g/km)	152					
	Transport Buses (g/km)	745					
	Commercial transport (<3.5 t) (g/km)	208					
	Commercial transport	359					

	(>3.5 t) (g/km)						
Buildings and Heating and Cooling	Heating Production (District Heating)(g/kWh)	200					
	Heating Production (Local Heating)(g/kWh)	213					
Electricity	(Emission factor of the national mix 2019)(g/kWh)	222					

A-1.3: Activities by sector of origin (source: input data of the economic model)			
Base year		2019	
	Scope 1	**Scope 2**	**Scope 3**
Transport			
Private vehicle demand (M km/year)	11924		
Bus demand (M km/year)	237		
Train/metro demand (M km/year)	55		
Commercial transport demand (<3.5 t) (M km/year)	345		
Commercial transport demand (>3.5 t) (M km/year)	1084		
Buildings and Heating and Cooling			

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Heating and DHW demand (GWh/year)	10258		
Electricity			
Electricity demand (GWh/year)		12836	
Waste			
Total collected within the city (tonnes)			1356230
Other			

A-1.4b: GHG emissions by sector of origin (data source: Economic Case)					
Base year	2019				
Unit	t CO2 equivalent/year				
	Scope 1	**Scope 2**	**Scope 3**	**Total**	**% of Total**
Transport	2315235			2315235	24%
Buildings and Heating and Cooling	2130892			2130892	22%
Electricity		2866513		2866513	30%
Waste*			519193	519193	5%
Other	1698751			1698751	18%
Total	6144878	2866513	519193	9530584	100%
** Includes Scope 1 Waste (produced and processed in the city) and Scope 3 Waste (produced by the city but processed outside) emissions.*					

A-1.4c: GHG emissions by sector of origin (data source: Economic Case)					
Base year	BAU 2030 (Business as Usual 2030)				
Unit	t CO2 equivalent/year				
	Scope 1	**Scope 2**	**Scope 3**	**Total**	**% of Total**
Transport	1701787			1701787	19%
Buildings and Heating and Cooling	2166648			2166648	24%
Electricity		3105907		3105907	35%
Waste*			283178	283178	3%
Other	1698751			1698751	19%
Total	5567186	3105907	283178	8956270	100%
** Includes Scope 1 Waste (produced and processed in the city) and Scope 3 Waste (produced by the city but processed outside) emissions.*					

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MODULE A-2

Current Policies and Strategies Assessment

Indicate relevant policies, strategies or initiatives or regulations at local, regional and national level that are relevant to the city's transition to climate neutrality.

A-2.1: List of relevant policies, strategies and regulations					
Type	**Level**	**Name and/or title**	**Description**	**Relevance**	**Necessary actions**
Institutional Declaration	Local	Declaration of Climate Emergency 2019	Declaring a climate emergency means assuming the fulfilment of real and binding political commitments, much more ambitious than the current ones, with the consequent allocation of resources to deal with to this crisis.	It involves driving forward the process of education, training and awareness-raising for the whole population about the severity of the ecological crisis and the enormous changes that are needed to curb the emergency.	
Strategy	Local	MADRID 360 Sustainability Strategy	The objective of the strategy is to improve air quality through three axes: actions in the city (energy efficiency in municipal buildings and housing),	...	Measures to promote the transition to efficient air conditioning systems, fleet renewal, the promotion of public transport, the integration of

			actions in mobility (such as low-emission zones), and actions in administrative innovation (such as updating local regulations).		all modes of transport, the reinforcement of road safety and innovation.
Technical document	Local	Roadmap to climate neutrality for the city of Madrid	Technical document identifying and prioritising climate action measures with the most significant reduction potential Complete document 2021		
Municipal regulations (Ordinance)	Local	Air Quality and Sustainability Ordinance (OCAS)	Complete document 2022		
Municipal regulations (Ordinance)	Local	Sustainable Mobility Ordinance	2022		
Institutional Declaration	National	Institutional Declaration "Climate Neutral Cities in 2030".	Signing of a declaration with the Ministry of Ecological Transition and the cities of Barcelona,		

			Valencia and Seville. 8 September 2022		
Plan	National	NNACC 2021-2030	National planning instrument for coordinated action on climate change	81 lines of action across 18 areas of work	
Strategy	National	Spanish Urban Agenda	A strategy paper for sustainability in urban development policies	A working method and a process for all actors, public and private	
Strategy	National	Long-term decarbonisation strategy (ELP 2050)	It shows a decarbonisation pathway that will guide investments in the coming years, underpinning the shift to an emission-free economy.	Imposes obligations on local authorities and other actors	
Law	National	Law 7/21 on Climate Change and Energy Transition	It establishes minimum targets for the year 2030 for the reduction of GHG emissions, the penetration of renewable energies and their minimum share in the		

			electricity system, and the reduction of primary energy consumption.		
Plan	National	Recovery, Transformation and Resilience Plan for Spain	National plan to join the NextGeneratio nEU Recovery Plan for Europe		
Plan	Local	Recovery, Transformation and Resilience Plan for the city of Madrid	Plan to boost the transformation strategy for the coming years, which aims to make Madrid the best place to live and work by 2030.	It collects 105 transformative investments in key areas of urban action.	

A-2.2: Description and evaluation of policies

At the local level, the Roadmap to Climate Neutrality for the City of Madrid in 2050 is the technical analysis to support the political commitment to action on Climate Change, published in March 2021. The Roadmap aligns municipal policies with national and European policies, and raises the ambition required for cities that want to be at the forefront of this global movement, because the objective of this Roadmap is to reduce Greenhouse Gases (GHG) by 65% by 2030 (compared to 1990 levels), and to achieve climate neutrality by 2050, as well as to increase resilience to climate risks. The roadmap reflects a clear political commitment that provides the framework on which to develop the full range of transformative projects.

In the course of this first iteration of the Climate City Contract, the ambition is increased and it is also expected that the 'Roadmap' will be updated in a way that seeks to integrate the social character in each lever and measure with the aim of ensuring equity and inclusiveness. A working group has been set up with the participation of social organisations such as Oxfam, Save the Children, Porticus, EAPN, Fuhem, among others, to review the Roadmap from a social perspective, learning from their experience and work and connecting initiatives that multiply the inclusive

transformation of the city. This group will work for a year to address the review but will have continuity through specific projects to ensure a just transition.

The Roadmap is supported by the city's strategic framework: Madrid 360: Environmental Sustainability Strategy. Madrid 360 operates as a strategy from 2019 with the aim of combating climate change and meeting the air quality limits set by EU legislation and the WHO. It covers all emission sources and all districts of the city, and will improve air quality through three pillars of transformation: the city, mobility and administration.

At the national level, the Spanish Urban Agenda, in accordance with the criteria established by the United Nations 2030 Agenda and the Urban Agenda for the European Union, establishes the strategic framework of the Madrid Urban Agenda that gives coherence to all areas of government and public policies of the city.

The National Strategy for Green Infrastructure and Connectivity and Ecological Restoration establishes a harmonised administrative and technical framework for the whole of Spain.

The National Integrated Energy and Climate Plan and the Climate Change Adaptation Plan 2021-2030 (PNAAC) are the basic planning instruments to promote coordinated action against climate change and its effects in Spain. They establish emission reduction targets, growth of renewable energies and main actions to build a more resilient economy and society.

Spain's Recovery, Transformation and Resilience Plan is part of the national plans to join the NextGenerationEU Recovery Plan for Europe. This plan will increase productivity and potential growth, moving towards a green, digital, inclusive Spain, with greater social and territorial cohesion and without gender gaps.

The Plan for the Recovery, Transformation and Resilience of the city of Madrid includes 105 transformative investments in key areas of urban action such as mobility, renewable and distributed energy generation, digital transformation of municipal services and businesses, increasing green areas and improving their conservation and ecological connectivity, neighbourhood regeneration and housing, without forgetting social cohesion, territorial rebalancing, attention to children and gender equality. With this Plan, the city is positioning itself for the opportunities offered by the European Next Generation EU Funding Framework.

Furthermore, at the regional level, the Autonomous Community of Madrid is preparing the 'Energy, Climate and Air Strategy Horizon 2030' in which it again shows ambition in the transition towards climate neutrality and will complement local and national plans.

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In addition to the Roadmap, two other important milestones that reflect the strength of the commitment to climate action are:

- **Declaration of climate emergency 2019:** approved in plenary session of the city council.

Declaring a climate emergency showed the need of delivering real and binding political commitments, much more ambitious than the current ones, with a consequent much more ambitious than the current ones, consequent with the allocation of resources to address this crisis. A binding roadmap capable of guaranteeing the necessary annual greenhouse gas reductions, the abandonment of fossil fuels, the commitment to 100% renewable energy and the reduction of greenhouse gas emissions, as a matter of urgency and priority.

- Signing of the pre-Climate City Contract in 2021 with the Spanish government and the Mayor of the city, as a declaration of commitment to accelerate the city's climate neutrality and which seeks to have a tractor effect to accelerate its sustainable transition, an objective with which the European Commission aims to accelerate compliance with the Paris Agreement and the 2030 Agenda, and to become a catalyst element of the European Green Pact.

Some of the gaps that were identified during 2022 was that the 'Roadmap' needed to be review from a social perspective to integrate the social character in each lever and measure with the aim of ensuring equity and inclusiveness. That's why a working group was launched to set up with the participation of social organisations such as Oxfam, Save the Children, Porticus, EAPN, Fuhem, among others, to learn from their experience and work and connecting initiatives that multiply the inclusive transformation of the city.

Spain's energy sector is constantly evolving and requires an agile response from cities to adapt to these changes. Working on local regulations that reflect these changes and allow for progress in new consumption models, such as energy communities, seems essential on the road to decabonisation. The City Council has created the **Sustainability Office** that will work strategically to study a plan for the deployment of distributed energy in all the city and with the support of public-private collaboration (Madrid Solar) for the promotion of individuals. In addition, they will analyze the barriers and opportunities to carry it out and may need regulatory support and definition of new strategies to achieve the objectives.

There are some barriers expressed in A3-2 section that would prevent the implementation of the transformation projects. The city will work in the coming months on the following issues:

1. Analyze regulatory barriers to the development of transformative projects in the city. What is needed? what problems do we encounter in carrying them out aound the **initiatives and projects** included in the Action Plan? (This involves identifying and defining in detail the different actions, initiatives and projects that form part of the Action Plan, with the aim of ensuring their financing and adequate implementation)

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In this line, the Madrid City Council has been working since 2019, with the support of the Technical University of Madrid (UPM), citiES 2030 and EIT Climate-KIC, on new ways to innovate in the administration through new tools such as the Regulatory Sandbox. A sandbox (also called a controlled testing space or experimentation area) incorporates new ideas through innovation, experiments and collaborative evaluations of regulatory options that make it possible to unlock and update regulatory frameworks at municipal, regional and state level to accelerate decarbonisation and other strategic objectives in the short and medium term. So a Sandbox is: (1) a space for collaborative learning, where a diversity of public, private, scientific and civic professionals think, speculate and test what the carbon neutral, healthier, smarter and more prosperous city of the future will look like; (2) a space for innovation that can lead to changes in regulatory frameworks applicable at city, regional and state level, with international learning. Regulatory changes that favour the city's strategic objectives and plans are applicable beyond the temporal or geographical boundaries of the sandbox.

For this work, we have relied on the interdepartmental "Clima" group, together with the wide network of collaborators in the Madrid ecosystem. An analysis of policy barriers has been developed for the development of action plans to address them. Within this framework, we will develop contributions to the current process of modifying the Madrid City Council's Urban Development Regulations, led by the Urban Development Area. This has carried out a first iteration generating a series of modification proposals, which can be strengthened with new approaches and multidisciplinary perspectives. The regulatory sandbox team has selected some of them to facilitate an open process curated by experts in each field. The selected proposals. Among the main lines of work, we have identified the following:

- MOBILITY: Transitional Destination of Plots of Land to impact on the aspects related to surface parking and the provision of spaces to facilitate the circular economy, in particular during construction works; Provision of Parking Services to impact on the decarbonisation of the city, promote sustainable and active mobility.
- BUILDING: Built-up area per floor and overhangs and façade overhangs to influence the decarbonisation of the entire life cycle of buildings and promote sustainability.
- GREEN SPACES: Green Factor and Open Space Development to maximise the contribution of open spaces to urban biodiversity, climate change adaptation and to improve rainfall management and microclimatic conditions; Endowment use of green spaces and urban gardens with a focus on green infrastructure, connectivity, biodiversity, natural water cycle and urban decarbonisation.
- PUBLIC SPACE AND FACILITIES: Endowment Uses Collective Services and Infrastructure Services to impact on aspects related to the circular economy, distributed generation of renewable energy and zero emissions, self-consumption models and other emerging uses linked to sustainable lifestyles and consumption;

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Review in the definition, localised linkage in Equipments (any category), design conditions (greater naturation of spaces, generating conditions to strengthen social life in general and the well-being of the most vulnerable groups, furniture and singularisation, etc), categories by surface or pavement width.

2. Analyse transformative projects weak points regarding regulatory issues in order to develop regulations and strategies that can strengthen those weaknesses.
   For this task, broaden **interdepartmental collaboration** to advance the implementation of the Climate Investment Plan would help identifying some weaknesses. (Promotion of the interdepartmental Clima Group.)
   In this line, the Madrid City Council has been working since 2019, with the support of the Universidad Politecnica de Madrid, citiES 2030 and EIT Climate-KIC, on new ways to innovate in the administration through new tools such as the Regulatory Sandbox. In the following document (link) the team has made an extensive analysis of the sectoral work streams: water cycle, circular economy, biodiversity and naturation, energy and mobility; as well as cross-cutting levers of change: regulation, governance and management, technology and financing. In all these lines of action, it has been identified who has the municipal competence, what opportunities are foreseen in the short and medium term, and how these actions have synergies with Madrid's Climate Neutral Roadmap
   See more information in the tool shown in this link.

As indicated at the beginning of Module A1, information has been taken from the following analyses for the completion of this document:

- Greenhouse gas emissions **inventory** of the city of Madrid
- **Roadmap** to climate neutrality for the city of Madrid
- Study of the **economic model** for implementing the measures set out in the city's climate action plan (Roadmap to climate neutrality).

To fill in the following table showing the emissions gap, data from the study carried out on the **Economic Model** of the city of Madrid have been used.

As indicated in the expression of interest to be part of the Mission, due to the complexity and size of the city of Madrid, work will be done to accelerate the climate action plan published in 2021, which establishes a reduction of 65.3% of greenhouse gas emissions by 2030 compared to 1990 values, which represents a 61% reduction in the volume of tonnes compared to 2015. This offers residual emissions of 4.5 MKton CO_2eq (values indicated in 'Roadmap to climate neutrality for the city of Madrid' not included in the table as they are not part of the economic model).

The Roadmap towards climate neutrality contemplates a more ambitious "extended scenario" in its reduction targets for 2030, with residual emissions in 2030 of 3.4 MKton CO_2eq. This

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scenario assumes a 75% reduction in greenhouse gas emissions compared to 1990 values which, with a Climate City Contract that puts in place innovative transformative tools and mechanisms, would make it technically, economically and socially feasible.

Residual emissions will need to be addressed in subsequent iterations of the Climate City Contract and can be reduced, for example, by offsetting emissions through forest sinks, such as the municipal public-private partnership programme 'Madrid Compensa'[3] .

[3] https://www.madrid.es/portales/munimadrid/es/Inicio/El-Ayuntamiento/Medio-ambiente/Madrid-Compensa/?vgnextoid=84aff0c7255be710VgnVCM1000001d4a900aRCRD&vgnextchannel=4b3a171c30036010VgnVCM100000dc0ca8c0RCRD#:~:text=%C2%BFQu%C3%A9%20es%20Madrid%20Compensa%3F%20Madrid%20Compensa%20es%20un,de%20carbono%20y%20fomentar%20la%20naturaleza%20en%20Madrid.

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A-2.3: Emissions Gap								
Outreach 1 y 2	*Reference/Baseline Emissions* *(kilotonnes)(percentage)*		*Residual emissions*[1] *(kilotonnes) (percentage)*		*Emission reduction target*[2] *(kilotonnes) (percentage)*		*Emissions Gap (to be addressed by the Action Plan)*[4] *(kilotonnes)(percentage)*	
	(absolute value)	*(%)*	*(absolute value)*	*(% BAU 2030)*	*(absolute value)*	*(% BAU 2030)*	*(absolute value)*	*(% BAU 2030)*
Transport	1.702	19%	340	20%	788	16%	574	34%
Buildings and Heating and Cooling	2.167	24%	433	20%	1332	27%	401	19%
Electricity	3.106	35%	466	15%	2.640	54%	0	0%
Waste	283	3%	57	20%	90	2%	137	48%
Other	1.699	19%	340	20%	1135	67 %	224	13%
Total	8.956	100%	1636	18 %	5985	67 %	1335	15 %

1 Residual emissions are emissions that cannot be reduced through climate action and are offset. Residual emissions can amount to a maximum of 20%, as indicated in the Mission Info Kit.
2 the target for emission reductions in the "Others" sector is assumed to be the same as in the other 4 sectors.

Thanks to the '**Economic Model**' we are able to simulate a 75% reduction in greenhouse gas emissions compared to 1990 values for the 'extended case'. In this way, by channelling the efforts of the Mission and putting in place transformative tools and mechanisms, the city should

drive emission reductions in the transport and Buildings and Heating and Cooling sectors. The results can be seen in the table below:

A-2.3: Emissions Gap - EXTENDED CASE								
Outreach 1 y 2	***Reference/Baseline Emissions*** *(kilotonnes)(percentage)*		***Residual emissions[1]*** *(kilotonnes) (percentage)*		***Emission reduction target[2]*** *(kilotonnes) (percentage)*		***Emissions Gap (to be addressed by the Action Plan)[4]*** *(kilotonnes)(percentage)*	
	(absolute value)	*(%)*	*(absolute value)*	*(% BAU 2030)*	*(absolute value)*	*(% BAU 2030)*	*(absolute value)*	*(% BAU 2030)*
Transport	1.702	19%	340	20%	1.021	60 %	341	20 %
Buildings and Heating and Cooling	2.167	24%	433	20%	1.715	79 %	19	1 %
Electricity	3.106	35%	466	15%	2.640	54%	0	0%
Waste	283	3%	57	20%	90	32 %	137	48%
Other	1.699	19%	340	20%	1.278	75 %	81	5 %
Total	8.956	100%	1636	18 %	6.681	75 %	578	7 %

The strategy for developing this ambition will be carried out within the framework of the Mission and will be reported on in subsequent iterations of this Climate City Contract.

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MODULE A-3

Systemic Barriers and Opportunities to 2030 Climate Neutrality

Develop the results of the mapping of the climate action stakeholder ecosystem and the identification of systemic barriers and opportunities.

- ***Barriers**: understanding and mapping the main elements (infrastructure, capacities, processes, partnerships, funds) that could hinder the transition to climate neutrality.*
- ***Opportunities:** understanding and mapping the main elements (infrastructure, capacities, processes, partnerships, funds) that could contribute to the transition to climate neutrality.*
- ***Create a participatory model for city climate neutrality (local platforms):** stakeholder ecosystem, partnerships with stakeholders, with other areas of government, with the private sector, with citizens, with other cities, with academic or research and innovation institutions; stakeholder involvement and contribution to the development and implementation of the city's climate policy, etc.*
    - ***Detect the existing connections and links** with the actors that make up the system (all urban actors) and the main interests around which they collaborate.*
    - ***Compare opportunities and barriers with your strategic objectives** to understand how to establish the most favourable conditions (i.e. prepare the local system) for the implementation of the transition to climate neutrality.*

A-3.1: System and stakeholder mapping				
Description of the system	**Actors involved**	**Web**	**Influence**	**Interests**
Social	Citizens, social organisations, City Council	- Multi-actor platform - Working group for the review of the Roadmap to Neutrality	Raising public awareness. Co-creation processes to propose measures and levers that do not increase the social divide.	Involve the social sector to ensure that the proposed levers and measures cover the whole spectrum of the population.
Private sector	Companies	- Mission Working Group	Attracting investment and	Economic growth opportunity

	SMEs and the self-employed -Cooperatives -Start-up ecosystem -Banks and financial institutions -Ambassador organisations -Subscribing entities	Multi-actor platform -Business networks	aligning with neutrality objectives	
Organisation	City Council	Clima Group	Creation of spaces for dissemination of transformative projects and new work management.	Improvements in internal coordination systems, opportunity to work on innovative projects
Academia: Universities, Research Centres and Educational Institutions	- City-University binomial - University Chairs Madrid Mission -Educational establishments	Inter-university working group School community working group	Driving forces	- Development of R&D and project initiatives aligned with the Mission -Climate Neutral Demonstration Centres in the city as a connected grid
Other Administrations	Regional National	- Multi-actor platform - Mission Working Group	Driving forces	Meet objectives and targets set by international and national policy frameworks

A-3.2: Description of systemic barriers
The Spanish regulatory framework, often considered excessively prescriptive and rigid, could be a barrier to the necessary innovation in the process of transition to reach neutrality. The lack of agility in the regulatory and administrative process prevents the incorporation of innovations of various kinds. Regulations are not easily and quickly adapted to the requirements of climate innovation, often becoming rapidly obsolete and preventing actions that could have a positive impact. Furthermore, it is necessary to strengthen the regulatory framework and its application in order to intensify the fight against the climate crisis.

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The public-private collaboration that is essential for the joint construction of new urban models and imaginaries is not sufficiently developed. There are few mechanisms that explore formulas for collaboration beyond contracting and sponsorship. There is a lack of formulas that allow for a systemic and continuous participation of all the agents involved in the areas of action. In terms of urban management procedures, the conventional formulas of sponsorship and patronage, combined with the limitations of public procurement, do not allow for the flexible public-private management of investments required for the transition to carbon neutrality.

The lack of financial mechanisms for the implementation of high-impact climate neutrality projects that combine private and municipal public funds can also be a constraint.

Citizen engagement is also critical for the fulfilment of the Mission. Progress must be made in mechanisms for citizen participation in climate policies, plans and actions. An example could be the need to disseminate climate objectives to society in non-expert language. In order to reduce the barrier of participation of marginalized group a working group was launched with the participation of social organisations such as Oxfam, Save the Children, Porticus, EAPN, Fuhem, among others, to learn from their experience and working together on emission reduction policies to ensure that all segments of the population are taken into account (leaving no one behind). It Is a project finance by Porticus and in collaboration with itdUPM.

With regard to municipal management, the current centralised model is a barrier, where the processes of planning, design, execution and maintenance are not adequately coordinated, nor are they implemented in a transversal manner in the organisation. The inertia of working in silos and the compartmentalised distribution of competences is an impediment to the development of integral actions necessary in the processes of urban transformation towards neutrality.

Some opportunities of the city to support the planning for climate action plan are as follows:

- There is an active interdepartmental and collaborative working group (Clima group) formed since 2020 that serves as a connection, communication between the different areas but also as a space for collaboration for new projects.
- Thanks to our work in different European projects, we have established working methodologies that can be replicated as well as design criteria. We also have examples of public-private partnerships that work, so it is a matter of replicating examples already developed in the city, not reinventing the wheel (example: Madrid Nuevo Norte, Madrid Compensa, Madrid solar…etc).

As example of transformative european project, in 2019 the city joined the EIT Climate-KIC community's Deep Demonstration project with the commitment of the city to increase efforts to reach the inflection point towards climate neutrality. A first objective of this initiative has already been achieved, with the creation of the Clima Group, a multi-stakeholder forum involving a wide range of City technical officers that works on climate action from various fields.

The stakeholders involved in the Madrid Deep Demonstration are aware that accelerating climate innovation and action must have an important cultural dimension, rooted in the identity of Madrid as a dynamic, open city, with high life expectancy and quality of life and strong economic dynamism. The fight against climate change must be based on these characteristics.

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During these years, a set of strategic areas of action has been selected that make up a portfolio of experimentation in the city on which to work in the coming months. The execution of an experimentation portfolio requires connecting various projects and initiatives that, together, multiply their individual potential and have greater impact than they would on their own.

An intense work had been developed focused on:

- Identification and mapping of the City's climate policies and strategic plans.
- Connection with existing strategies and initiatives managed by collaborating partners: companies, local social organisations, other Madrid and national public administrations, universities and research centres, citizens, and other interest groups.
- Alignment of the strategic experimentation portfolio with the current COVID-19 context.
- Strategic work with various areas and departments of the Madrid City Council for the planning of the work and the forecast of financing.

The multi-stakeholder ecosystem in Madrid is active and willing to collaborate in new iniciatives under the Mission.

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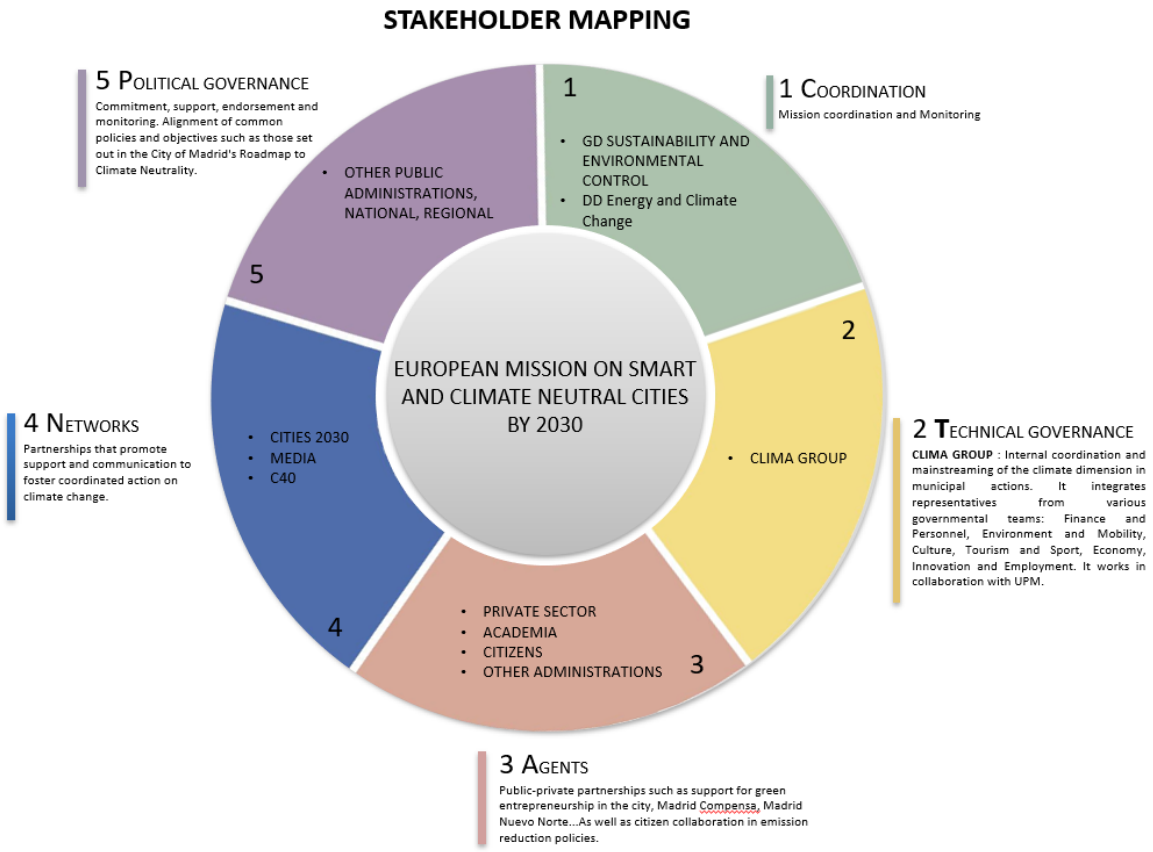
A-3.3: Description or visualisation of the city's participatory model for climate neutrality



PART B - PATHWAYS TOWARDS CLIMATE NEUTRALITY BY 2030

This module represents the core of the Climate Neutral Action Plan 2030, consisting of the essential elements: scenarios, strategic objectives, impacts, portfolios of actions and indicators for monitoring, evaluation and learning.

MODULE B-1

Climate Neutrality Scenarios and Impact Pathways

Indicate impact pathways, short- and long-term outcomes, and direct and indirect impacts (co-benefits).

See description B-1.2 with explanation of compliance with table B-1.1 on impact pathways as it has been filled in with data from the **city's economic model**:

B-1.1: Impact pathways					
Sector	***Systemic levers***	***Early changes (1-2 years)***	***Late outcomes (3-4 years)***	***Direct impacts (emission reductions) (Kton)***	***Indirect impacts (co-benefits)***
Sector: Buildings and Heating and Cooling **Subsector:** New buildings highly energy efficient	*Technology and infrastructure*	Define innovative energy use and storage systems as demonstration projects.	Detail these systems in procurement documents to scale up their use in new buildings.	23	Increasing the comfort of new and future building stock
	Governance and Policy	Maintain the multi-stakeholder working group to deepen the clauses to be included in all	Expanding the public-private partnership model, involving more city actors		Awareness raising for new users (recruitment)

		new developments.			
	Learning and capabilities	Collect all lessons learned and consider their possible application to other sectors.	Export lessons learnt and working model to other sectors of the city		Fostering the entrepreneurial and mediating skills of public employees as agents of change
Sector: Buildings and Heating and Cooling **Subsector:** Building energy efficiency renovations	Social innovation	Establish new energy rehabilitation models involving citizens and the private sector in their definition.	Efficiently implement such models to boost energy rehabilitation in the city.	60	Local job creation through new models of energy (co-)production and retrofitting
	Governance and Policy	Creation of systems/models for consultation and management support for citizens	Model implemented and replicated in the city		Increased citizen satisfaction by involving and accompanying them in the process of rehabilitating their homes.
	Finance / Funding				
Sector: Buildings and Heating and Cooling **Subsector:** *Efficient lighting & appliances*	*Technology and infrastructure*	Promoting the renovation of individual and collective systems in buildings (lighting, electrical appliances, etc.).	Reduction of individual and collective consumption per building due to the replacement of old equipment by more efficient equipment.	247	Reducing the cost of energy bills

Sector: Buildings and Heating and Cooling **Subsector:** Decarbonizing heating	Technology and infrastructure	Promotion of electrified heating systems (heat pump)	Reduction of greenhouse gas emissions associated with fossil fuels (mainly from individual gas boilers)	*1002*	Job creation specialising in heat pumps or other electrical heating systems
Sector: Transport **Subsector:** Reduced passenger transportation need	Governance and Policy	Consolidation of telework and hybrid work (face-to-face and telework) by regulation in those jobs where it is feasible.	Telework and hybrid work policy operating in most employing organisations	*215*	Increased possibilities to reconcile work with personal and family life.
	Social innovation	Promoting models of proximity urban planning, involving citizens in their definition.	New urban developments based on the concept of the city of proximity and the 15-minute city.		Boosting local economic activity and socio-economic revitalisation of neighbourhoods and districts
Sector: Transport **Subsector:** Shift to public and non-motorized transport	Technology and infrastructure	Expansion of demonstrator cycle and pedestrian lanes in primary, secondary and university campus environments.	Mobility models scalable to all schools in the city and other cities in Spain and Europe.	39	Active mobility habits embedded in family and student routines through low-emission modes of mobility
	Democracy / participation	Pilot interventions in schools co-created and implemented	Scaling up the results of the pilot projects to other areas of the city following		Positive perception of school users and their families about

		with families and the school community.	participatory design principles.		the management of the school and its environment.
	Learning and capacities	Participatory and co-creation methodologies applicable in projects to promote the active mobility	Forms of management that incorporate channels for co-creation and dialogue with citizens in an integrated way.		Positive public perception of the city's public administration
Sector: Transport **Subsector:** Increase shared transport and car pooling	Governance and Policy	Support for Increase shared transport and car pooling models, facilitating their implementation , especially in Low Emission Zones.	Growth of the zero-emission car sharing network	99	Boosting local economic activity through ventures linked to forms of shared mobility (car, motorbike, bicycle, software applications for managing these forms of mobility, etc.).
	Technology / infrastructure	Expansion of the municipal bike-sharing network BICIMAD to areas of the city where it is not yet present.	BICIMAD bike-sharing network extended to the whole municipality		Shared mobility habits incorporated into citizens' daily routines
Sector: Transport **Subsector:**	Learning and capacities	Apply learnings from freight management in Low Emission Zones to other areas of the	Evaluation of the city's freight mobility management, especially in Low	*133*	Internal working group to strengthen

Optimise logistics		city. Innovation in delivery models.	Emission Zones and replication of lessons learned in the city and in other cities in Spain and Europe.		internal governance.
Sector: Transport **Subsector:** Electrification of passenger cars	Technology / infrastructure	Extending the public access opportunity recharging network to other Districts of the city.	Expansion of the public access opportunity recharging network to all Districts of the city.	*182*	Electric mobility habits incorporated in citizens' daily commuting routines
Sector: Transport **Subsector:** Electrification of buses	Technology / infrastructure	Transition to zero emission bus fleet.	Creation of new zero-emission operations centres with bus recharging network	*62*	Improved coordination of loading schedules and reduced loading times
Sector: Transport **Subsector:** Electrification of freight transport	Technology / infrastructure	Study on the implementation of logistics hubs in the city	Development of new logistics hubs in the municipality	*59*	Public satisfaction with freight logistics management
Sector: Electricity **Subsector:** Shift to renewable electricity	Social innovation	Development of a pilot project on the study of new energy models to extend the distributed energy generation network in the city.	Implementation of a participatory local energy community in a municipal facility (educational centre).	*2.640*	Improve communication and governance on decisions related to energy provision of the actors working in the city.
	Learning and capacities	Demand from citizens' groups, start-	Citizen empowerment in renewable energy		Working groups, associations

		ups, SMEs and large companies for the promotion of renewable energy (co-)production initiatives.	(co-)production through local energy communities		and social movements linked to the promotion of local energy communities for the expansion of renewable energy co-production practices.
	Finance / Funding	New business model tested in pilot project for renewable energy production through a local energy community	Sustainable financing models operating in local energy communities		Perception of the "pro-consumer" role of citizens as being able to combine their position as passive energy consumers with that of active producers in the energy production chain.
Sector: Waste and reforestation **Subsector:** Increase recovery rates in the residential, services and institutional sectors.	Technology / infrastructure	Tender for a new composting plant and FORS	Commissioning of the new composting plant and FORS	*90*	Involve citizens in changing the urban waste management model.
	Governance and Policy	Extension of hours and days for household waste collection	Evaluation of the measure, specifically whether the extension of days and times has led to an increase in recycling rates, and incorporation of		Boosting local employment and a positive perception of public management among citizens.

			learning and results into further related actions.		
Sector: Waste and reforestation **Subsector:** Naturalise and reforest the municipality	Democracy / participation	Participatory sub-project development of the Metropolitan Forest	First phases of completed projects. Communication and opening of these spaces to the public.	*N/A*	Improving the city's biodiversity
	Learning and capacities	Involvement of citizens and organisations linked to the design, management and maintenance of urban green infrastructures.	Co-created forms of management and maintenance with the citizenry (specific publics) in operation		Positive perception of governance

B-1.2: Description of the impact pathways

The city of Madrid in its 'Roadmap to climate neutrality' as impact pathways proposes measures for 5 sectors with 6 main axes. The systemic intervention in these areas of climate neutrality represents a paradigm shift in the way of approaching actions, which abandon the traditional sectoral approach, and comprehensively address the current models, focusing on changing patterns of use to reduce emissions at source. In this way, interventions are analysed with an 'Avoid-Change-Improve' philosophy:

- **Avoiding** emissions: proximity urban planning, creation of low-emission and special protection zones, rehabilitation and energy efficiency, reduction of obligatory travel, waste minimisation, among others.
- **Shifting** to less polluting options and solutions: such as electrification of energy demand in different sectors, boosting active mobility by expanding the cycling and pedestrian network or boosting the use of zero-emission public transport.
- **Improve** through technological development to minimise the impact of the solutions adopted: decarbonisation of the electricity system through distributed generation from renewable sources, improving and electrifying the vehicle fleet.

In this case, in order to comply with table B-1.1 on impact pathways, the **model of the economic case** of the city of Madrid has been used, which is developed in 5 sectors and 14 subsectors or levers on which an estimate is made of the emissions to be abated and the investment necessary to develop it is quantified.

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According to the model, almost 85% of the emissions to be abated in 2030 correspond to three main sectors: Buildings and Heating/Cooling, transport and electricity, and specifically to 4 levers. If the city is able to work systemically in these three main sectors, it will succeed in transforming the city not only from a climate point of view but also from a social perspective.

MODULE B-2

Climate Neutrality Portfolio Design

This section must contain a description of the project for each intervention envisaged, according to template B-2.1. Details of each action may be included in section B-2.2.

This section presents the projects that are considered transformative to be developed in the field of the Mission and that have a cross-cutting impact on different sectors and levers of change. They are proposed as **projects that demonstrate a systemic transformation** that connect visions and disciplines that are usually isolated, catalysing a transformation of the field as a whole by involving the different actors and stakeholders in these projects. They are co-creation projects related to climate action and serve as examples, not only to be scaled up to other levels of the city but also to replicate their models.

Each action is framed within a sector and the impact of each contributes to the success of the overall sector as detailed in the impact column in module C3.

B-2.1: Description of climate action portfolio		
Sector	**Description of climate action portfolio**	
	List of actions	**General description**
Sector: Buildings and Heating and Cooling **Subsector:** New buildings highly energy efficient	Madrid Nuevo Norte: zero emission buildings and ADAC Reinventing cities: Zero carbon urban projects 2019, 2020	New urban development with the ambition to be climate neutral. First Climate Action Demonstration Area in the city (Chamartín Business Centre). Initiative under the auspices of the C40 Cities Network to develop demonstration projects with decarbonisation criteria for the transformation and revitalisation of urban sites. Responsible: Madrid City Council (MCC) Area for Buildings + Crea Madrid Nuevo Norte

Sector: Buildings and Heating and Cooling **Subsector:** Building energy efficiency renovations	Green Office (EMVS)	Municipal pilot experience that provides citizens with information on energy efficiency and rehabilitation aid, both municipal, regional and state. Responsible: MCC Area for Buildings
Sector: Buildings and Heating and Cooling **Subsector:** *Efficient lighting & appliances*	Energy management programme for municipal buildings and equipment.	Continuous monitoring system and adoption of energy efficiency and energy saving measures in municipal buildings. Implementation of the Energy Management system in accordance with ISO50001 in 60 buildings (2023). Involvement and training of public employees. Responsible: MCC Area for Buildings
Sector: Buildings and Heating and Cooling **Subsector:** *Decarbonizing heating*	European Probono Project (The Integrator-centric approach for realising innovative energy efficient buildings in connected sustainable green neighbourhoods)	In Madrid the project will be tested through a pilot implementation of District Heating technologies based 100% on renewable energy (geothermal), these heating and cooling networks take advantage of the coexistence of residential and tertiary buildings and will be controlled and managed under a digital model that will allow maximum performance, stakeholder involvement, scaling and replication. Responsible: MCC Area for Buildings + Madrid Subterra
Sector: Transport **Subsector:** Reduced passenger transportation need	School environments with climate change adaptation and air quality criteria (Life-Pact Project)	European project to pilot the naturalisation of public spaces by exploring methodologies for the participation of school and neighbourhood communities in the co-design of naturalised school playgrounds and environments. This project contributes to the implementation of the Municipal Strategy for 'intervention in school environments from the point of view of air quality improvement and adaptation to climate change'. Responsible: MCC Climate Change Department + Life-Pact Partners
	Clever project - habitable itineraries	The itinerary from the river to Pradolongo is a project of urban regeneration and adaptation to climate change that serves as a background and framework for partial

		or specific interventions. It is the framework for the other two areas and is organised on three levels: a strategy for the itinerary and for the neighbourhood, a design and solutions that make the itinerary coherent and recognisable, and specific interventions. Responsible: MCC Climate Change Department+ Clever project partners
Sector: Transport **Subsector:** Shift to public and non-motorized transport	Zero-emission university campuses: UPM Campus Sur pilot project	This intervention aims to promote sustainable mobility for the new generations of Madrid, offering options for a more sustainable, safe and healthy mobility in the surroundings of educational centres while contributing to reduce the carbon footprint and noise pollution in these environments. The actions aim to improve pedestrian and cycling connections and infrastructure in the accesses to the educational centres of the Campus sur and other existing facilities in its area. It is planned as a pilot area to investigate mobility systems in the process of change from a multimodality approach that gives priority to active mobility with the extension of BiciMAD to the peripheral districts, new multimodal stations, MaaS, electrification of fleets and ZBE extended to the central area. ç Responsible: MCC Area for Mobility + UPM
	Climate commitment	Annual event organised by Madrid City Council and its collaborators with proposals from citizens and the City Council. All of them share the objective of building new climate narratives and cultivating new hopes for the climatic, economic and social future of the city of Madrid Responsible: MCC Climate Change Department
Sector: Transport **Subsector:** Increase shared transport and car pooling	Zero-emission shared mobility	Bici-Mad, the municipal bike-sharing system, will expand its network in the coming years to new districts of the city. Four variables have been taken into account to establish the locations: a socio-demographic study, technical feasibility, proximity to transport hubs to promote intermodality and dialogue with the districts. Responsible: MCC Area for Mobility
Sector: Transport **Subsector:** Optimise logistics	Mercamadrid: towards zero emissions logistics.	Transformation of the largest fresh food distribution, marketing, transformation and logistics platform in

		Spain. Implications for other sectors such as the circular economy. Responsible: MCC Economic Area+ MercaMadrid
Sector: Transport **Subsector:** Electrification of buses	Electrification of bus bases	Strategic collaboration of energy distribution companies, bus manufacturers, designers of intelligent recharging systems and public transport companies (EMT). Responsible: MCC Area for Mobility+EMT
Sector: Transport **Subsector:** Electrification of passenger cars.	Deployment of public recharging infrastructure (private and logistic use)	Expansion of the public access electric vehicle charging network to reach new districts of the city in order to cover private and logistical needs. Responsible: MCC Area for Mobility
Sector: Transport **Subsector:** Electrification of freight transport.		
Sector: Electricity **Subsector:** Shift to renewable electricity	Madrid Solar Deployment production and installation of photovoltaic in municipal buildings (educational centres).	Madrid City Council initiative and public-private management model to promote energy self-consumption with photovoltaic panels in the residential, institutional and service sectors. Within the project 'Intervention in educational centres with criteria for adaptation to climate change and air quality', new energy models for distributed energy consumption in the city will be studied, such as energy communities. Responsible: MCC+Madrid Futuro
Sector: Waste and reforestation **Subsector:** Increasing recovery rates in the residential, services and	Management of the organic fraction of waste at Valdemingómez	Start-up of a new organic and vegetable fraction composting plant to increase the production of biomethane and compost. Responsible: MCC Valdemingómez Department

institutional sectors.		
Sector: Waste and reforestation **Subsector:** Naturalise and reforest the municipality	Metropolitan Forest	Green infrastructure that will extend over 75 kilometres in the city of Madrid, which will contribute to the rebalancing of the city, the reduction of CO_2 emissions, the fight against climate change, the ecological and landscape restoration of degraded areas and increase the supply of pedestrian and cycling routes, as well as benefiting the health of the population. Responsible: MCC Area for Green Infrastructure

Some of the **transformative projects** are highlighted below. To develop these actions, the GD Sustainability and Environmental Control (DD Energy and Climate Change) acts as promoter and coordinator of these actions and involves different municipal departments depending on the activities to be developed but also external actors working on the project.

Total cost of actions to be addres are in module C3.

B-2.2: Individual Action Schemes		
Action plan	**Name of the action**	**Madrid Nuevo Norte**
	Type of action	Urban and real estate development. Private and public developer
	Description of the action	Madrid Nuevo Norte is an urban intervention of unique magnitude that will transform a 5.6 km long strip of land and regenerate more than 2.3 million m². The project arose from the need to integrate Chamartín station and all the railway facilities that depart from it into the city. For more than 50 years these infrastructures have created an enormous gap that has split the north of Madrid in two, causing many inconveniences for millions of citizens. This urban regeneration action will not only close this wound, solving problems of mobility, safety and lack of public services, but will also place Madrid among the group of cities that will be better able to face the great economic and social changes of the coming decades.

		Madrid Nuevo Norte creates a new city model, based on the best practices of sustainable urban planning. A dense, compact city that focuses on people, public space and sustainable mobility, where housing, offices, shops, green spaces and facilities blend and complement each other, creating the best environment for living, working and enjoying. Respecting the essence that makes our city so attractive, while enhancing its innovative and cosmopolitan character. A city model that thinks of everyone, which has been designed in participatory processes that have allowed us to listen to the citizens to find out their different needs and the different uses that each one makes of their city. The project is organised into 4 differentiated areas that will be developed through the compensation system with a particular urban sustainability regulation that makes it a benchmark in terms of sustainability, estimating that this regulation allows it to reduce by 20% the emissions expected by the new neighbourhood in 2030, with buildings that go beyond the concept of almost zero consumption buildings and with a mobility policy to promote sustainable mobility. In addition, within this area one of the areas will be declared a **Climate Action Demonstration Area**, for which an Action Plan will be approved with the aim of developing a climate-neutral neighbourhood.
Reference to the impact pathway	**Scope of issue**	Buildings and Heating and Cooling
	Systemic lever	Governance and Policy
	Result (according to module B-1.1)	
Implementation	**Agencies/persons responsible for implementation**	Chamartín Business Centre Management Committee / Chamartín Business Centre Compensation Board

		Comisión Gestora de Malmea - San Roque - Tres Olivos / Junta de Compensación de Malmea - San Roque - Tres Olivos Crea Madrid Nuevo Norte, S.A. ADIF, Community of Madrid, Madrid City Council.
	Scale of action and target entities	
	Actors involved	City of Madrid, EMT, Metro de Madrid, Comunidad de Madrid, Consorcio de Madrid, Juntas de Compensación de Madrid Nuevo Norte, ADIF, Canal de Isabel II.
	Comments on implementation	Through the compensation system, the owners of the land will form the Compensation Boards, entities responsible for drawing up and constructing the urban development project, which must be approved and received by the Madrid City Council or the competent bodies, and for drawing up the reparcelling project for the distribution of the ownership of the land after the urban transformation. The administrations will be in charge of executing public buildings and the real estate developers will be in charge of private buildings. Timeline for implementation: 2022-2026
Impacts and costs	**Renewable energy generated (if applicable)**	
	Energy removed/replaced, fuel volume or fuel type	
	Estimated GHG emission reductions (total)	107,720.46 tCO_2eq that are not added in 2030. In a fully implemented NRM scenario.
	Total costs and costs per unit of CO2eq	7.163 M€ 66,500 €/tCO_2eq only taking into account the estimated emission reductions in 2030

B-2.2: Individual Action Schemes		
Action plan	Name of the action	Life PACT
	Type of action	European project for the naturalisation of public spaces with participatory methodologies.
	Description of the action	The European Life-PACT project (2022-2025) provides an ideal framework for experimentation and exchange of experiences between the City of Madrid and the cities of Leuven and Krakow. Through this project, the Madrid City Council, in collaboration with the Polytechnic University of Madrid and the Democratic Society, is exploring methodologies for the participation of school and neighbourhood communities in the co-design of naturalised school playgrounds and environments. This project contributes to the implementation of the Municipal Strategy for 'intervention in school environments from the point of view of mitigation and adaptation to climate change'. Specifically, two pilot projects are being developed in two nursery and primary schools in the neighbourhood of San Cristóbal de los Ángeles (Villaverde District). The selection of this location responds to several reasons: the high vulnerability to climate change and in particular to heat waves, drought and loss of biodiversity; the socio-economic profile of its neighbours, which makes them more susceptible to the impact of climate change and, specifically, of summer energy poverty; a fairly cohesive social fabric committed to the development and welfare of their environment. In the first year of the project, a social and climate diagnosis of the neighbourhood was carried out, led by Gea21, Surcos Urbanos and the ABIO research group of the Polytechnic University of Madrid. In addition, several workshops have been carried out with school communities, particularly with primary school students, using micro-interventions and creative writing methodologies. The aim was to gain in-depth knowledge of the dynamics of use of the space and to imagine a future scenario of a naturalised courtyard open to the community. This process was facilitated by three actors: Democratic Society, Basurama and the Children's Assembly of the Mutant Institute for Environmental Narratives. This participatory

		diagnosis and the resulting proposals have given rise to two preliminary projects. In 2023, two architectural and engineering firms are developing the pre-projects into implementation projects. They are also exploring the incorporation of more permeable materials with a lower carbon footprint. The works are planned for 2023 (demolition of perimeter walls and construction of more visually permeable fencing) and 2024 (naturalisation). As the spaces are expected to be open outside school hours, a sustainable plan for the use and maintenance of the spaces is being designed with the school and neighbourhood communities. To this end, co-management models between public administration and residents are being explored. This project is an important source of learning for the City Council from various points of view: strengthening interdepartmental and district work; closer contact with neighbours; experimenting with new methodologies and more creative solutions. From the point of view of citizenship, this project is helping to raise awareness among primary school children about climate change and its consequences, and making them agents of change in their own built environment. From a climate change mitigation and adaptation point of view, a more naturalised environment will contribute to reducing the heat island effect and sequestering more carbon.
Reference to the impact pathway	**Scope of issue**	Transport / Renaturation
	Systemic lever	Governance and Policy
	Result (according to module B-1.1)	
Implementation	**Bodies/persons responsible for implementation**	Madrid City Council. Deputy Directorate General for Energy and Climate Change Junta de Distrito de Villaverde.

	Scale of action and target entities	School playgrounds and school environments. Neighbourhood of San Cristóbal de los Ángeles Colegio de Educación Infantil y Primaria Sagunto and Colegio de Educación Infantil y Primaria Navas de Tolosa (San Cristóbal de los Ángeles, Villaverde).
	Actors involved	Ayuntamiento de Madrid, Junta de Distrito de Villaverde (Servicios técnicos y Servicios a la ciudadanía), Universidad Politécnica de Madrid, Democratic Society (DemSoc), Basurama, Instituto Mutante de Narrativas Ambientales (Asamblea de la Infancia), exe.arquitectura, Prointec, Gea21, Surcos Urbanos, Colegio de Educación Infantil y Primaria Sagunto, Colegio de Educación Infantil y Primaria Navas de Tolosa, Escuela Infantil La Luna, Espacio de apoyo a la crianza de San Cristobal, Asociación de Madres y Padres del CEIP Navas de Tolosa, AFANDICE, Asociación de vecinos de San Cristóbal, etc.
	Comments on implementation	Timeline for implementation: 2021-2024
Impacts and costs	**Renewable energy generated (if applicable)**	
	Energy removed/replaced, volume or fuel type	
	Estimated GHG emission reductions (total)	
	Total costs and costs per unit of CO_2eq	
B-2.2: Individual Action Schemes		
Action plan	**Name of the action**	**Healthy, Clean Cities: EUropean Cities for Climate-Neutral COnstruction (HCC EU CINCO)**
	Type of action	Research and advocacy

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	Description of the action	Funded by the Laudes Foundation since the beginning of 2021, the project aims to research and prototype solutions that reduce emissions in the construction sector. In particular, the project focuses on promoting circularity and the use of natural and low-carbon materials. This project is based on collaboration between representatives of the entire value chain of the construction sector and adopts a systemic approach to co-create and pilot a portfolio of interconnected multi-stakeholder projects. In particular, the initiative relies on two large local developments in Madrid and Milan as a testing ground to identify supply and demand barriers. The working methodology has adopted a collaborative approach, involving the different actors of the value chain in conversations for collective interpretation and co-creation of solutions. The ultimate goal of the project is to position cities as market makers for natural and circular sourced construction. The results of the first phase of this project include the following documents: 1. Report 'Mass Timber - An Option to Reduce Embodied Carbon in Buildings' by Material Economics, which sets out the reasons why building is a significant contributor to climate change and strategies (in terms of design choices and material selection) that could reduce the embodied carbon of buildings. In addition, the report proposes the use of wood as a cost-effective way to reduce emissions, analysing potential barriers and financial opportunities. Emission abatement cost model for buildings, developed by Material Economics. Aimed at a technical audience, the model includes 16 levers to estimate the cost of each tonne of carbon that can be avoided in a building project by adopting strategies linked to circularity and the use of naturally sourced materials. This tool can be useful for dialogue with banks, clients and investors by making visible the additional benefits of this type of construction compared to standard methods based on steel and concrete. 3. Analysis of financing instruments, prepared by Bankers without Boundaries. 4. Study of the Spanish demand for wood, prepared by Arup. 5. Analysis of the market for low-carbon materials and analysis of the end-of-life market, prepared by Arup for the Spanish case.

		6. Analysis of the economic and environmental impact of construction with materials of natural origin, prepared by Dark Matter Labs, which presents structured data on the state of Spanish and EU forests and proposes scenarios of the socio-economic impact of increasing the production and use of wood from sustainable forests. It also presents examples of how to incorporate procurement clauses that encourage the use of wood in construction. The report, although addressed to a general audience, aims to influence national and European policies and regulations. 7. Proof of concept of a materials passport, developed by Dark Matter Labs and REDO. 8. Revision of municipal price lists and tender clauses for Madrid Nuevo Norte 9. Training for municipal technicians with the aim of promoting circular and naturally sourced construction in public projects in Madrid, developed by Dark Matter Labs and Universidad Politécnica de Madrid.
Reference to the impact pathway	**Scope of issue**	Buildings and Heating and Cooling
	Systemic lever	Learning and capabilities Technology and infrastructure
	Result (according to module B-1.1)	
Implementation	**Agencies/persons responsible for implementation**	Creates Madrid Nuevo Norte and allies
	Scale of action and target entities	
	Actors involved	EIT Climate KIC, Dark Matter Labs, Arup, Universidad Politécnica de Madrid, Material Economics, Bankers without Boundaries, Comune di Milano, Crea Madrid Nuevo Norte, Democratic Society, Net Zero Cities Laudes Foundation
	Comments on implementation	Timeline for implementation: 2020-2024

Impacts and costs	Renewable energy generated (if applicable)	
	Energy removed/replaced, volume or fuel type	
	Estimated GHG emission reductions (total)	
	Total costs and costs per unit of CO_2eq	

B-2.2: Individual Action Schemes		
Action plan	Name of the action	Climate commitment
	Type of action	Annual citizen involvement event
	Description of the action	**Climate Commitment** is an annual event organised by the Madrid City Council in collaboration with the Casa Encendida de Fundación Montemadrid, The Democratic Society and the Centre for Innovation in Technology for Human Development of the Polytechnic University of Madrid. This event already has two editions held in hybrid format: Madrid Zero Emissions (2021) and Mission Madrid (2022). ***Madrid Zero Emissions (2021)*** was a first contact with the radical climate commitment initiatives already underway in Madrid. These encompassed proposals coming from organised citizens and the City Council. All of them shared the objective of building new climate narratives and cultivating new hopes for the climatic, economic and social future of the city of Madrid. The session made it possible to disseminate their objectives, strategies and forms of organisation. In addition, it also provided information on the city's solutions to emit less CO2, mitigate heat waves or water shortages, and the root changes that we must promote in the way we

		educate about the environment or coexist with plants, animals or bacteria. ***Madrid Mission (2022)*** reinforced the objective of the previous event, but framed the initiatives presented as part of the path towards achieving the Mission "100 climate neutral cities by 2030", for which Madrid has been selected. In contrast to the previous year, the concept of "micro-missions" was introduced: citizens and institutions that have come together to achieve the Mission on a smaller scale and contribute to climate transformation projects in industrial estates, public facilities or schools, where nature, play and coexistence predominate. For this year's 2023 edition, the main ambition is to **amplify the reach of** the event and **reach out to neighbourhoods** through satellite events (held in so-called "climate shelters") and milestones in between during the year, to consolidate a community of people committed to climate neutrality in the city.
Reference to the impact pathway	**Scope of issue**	Transport / Modal shift
	Systemic lever	Governance/Participation
	Result (according to module B-1.1)	
Implementation	**Agencies/persons responsible for implementation**	Madrid City Council
	Scale of action and target entities	
	Actors involved	La Casa Encendida, Fundación Montemadrid, Centro de Innovación en Tecnología para el Desarrollo Humano de la Universidad Politécnica de Madrid (itdUPM), Antonella Broglia, Zuloark, EIT Climate-KIC, C40, Fundación Laudes
	Comments on implementation	**Recurrent event since 2021**

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Impacts and costs	Renewable energy generated (if applicable)	
	Energy removed/replaced, fuel volume or fuel type	
	Estimated GHG emission reductions (total)	
	Total costs and costs per unit of CO_2eq	

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B-2.3: Summary of the residual emissions strategy

In terms of direct GHG emissions, the management and treatment of bio-waste is of particular relevance at municipal level, which is why progress will continue to be made in optimising processes to reduce methane emissions at the Valdemingomez technological complex (PTV). To this end, the treatment of organic matter by means of biomethanisation (anaerobic digestion) and the use of biogas for transformation into biomethane injectable into the natural gas network will be promoted.

Considering the high importance of minimising food waste, its correct separation and the selective collection of the organic fraction, it is proposed to raise awareness and provide environmental education to citizens in order to improve the waste management process.

The generation of biomethane and electricity from renewable sources, from the waste produced by citizens and treated in the PTV or in wastewater treatment plants, also contributes to the reduction of fossil fuel consumption in the automotive, residential, industrial and service sectors in general, which is why we will continue to make progress in these renewable energy sources and in the application of the best available techniques to reduce atmospheric emissions.

The minimisation of construction waste (with a significant embedded carbon content as a result of its production and transport) should be highlighted as another important action within the circular economy strategy.

The development of offsetting mechanisms, such as the creation of carbon sink forests, will substantially increase the presence of nature and biodiversity in the city with all the associated benefits that this entails.

Madrid Compensa is a voluntary programme for offsetting CO_2 emissions and generating ecosystem services of the Madrid City Council. CO_2 emissions through this programme are offset by planting trees in the municipality of Madrid, which can be carried out either by the City Council or directly by the participating entities themselves, depending on the type of participation chosen. In addition, the programme also makes it possible to collaborate in the improvement of the city's green areas with financial contributions earmarked directly for these actions, or through direct intervention by the organisation.

Within the scope of Madrid Nuevo Norte (largest urban development with zero emissions) it is estimated that the annual absorption capacity of the green infrastructures of Madrid Nuevo Norte is 500 tonnes of CO_2 per year, taking into account its green infrastructures in roads, parks and gardens and landscaped areas in private plots. In addition, it is proposed to investigate the proposed regulation for certification in the European Union for carbon elimination.

In addition, the European Commission recently announced a proposal for the **first voluntary EU-wide framework to reliably certify high quality CO_2 removals**. The proposal will boost innovative CO_2 removal technologies and sustainable carbon dioxide capture solutions. Madrid is working on projects to boost biomaterials in the city that can also help to account for neutralising residual carbon

emissions through embedded carbon (Example: Healthy, Clean Cities: EUropean Cities for Climate-Neutral COnstruction (HCC EU CINCO)).

MODULE B-3

Monitoring, evaluation and learning indicators

It should contain a selection of indicators taken from the Comprehensive Indicator Sets developed by NetZeroCities. The following must be provided: an overview table listing the selected indicators by outcome and impact, including targets and assessment points (B-3.1); and a metadata table for each selected indicator as specified in the Comprehensive Indicator Sets (B-3.2).

The indicators detailed here were defined in the April 2022 update of the 'Roadmap to Climate Neutrality' and have been correlated with the sectors defined in the economic case. A first analysis of these indicators since 2020 has been reported, but it is necessary to progress in the development of the actions to observe trends and to be able to set target values for these indicators. Therefore, this column in table B-3.1 will remain pending for next iteration of this Climate City Contract.

B-3.1: Impact pathways						
Outcomes / impacts addressed	**Action / project**	**No. of indicator**	**Indicator name**	**Target values**		
				2025	**2027**	**2030**
	New buildings highly energy efficient	1.2.1 1.4.1 0.0.1	Total GHG emissions in the residential sector Total GHG emissions in the services sector Energy balance: Table 7 Final energy consumption in RCI	...	...	...

	Building energy efficiency renovations	2.1.1 2.1.2	Evolution of the number of rehabilitated dwellings (data to be received) Evolution of rehabilitated surface area			
	Renewal of systems (light, electrical appliances, ...etc.)	0.0.1 4.2.4	Energy balance: Table 7 Final energy consumption in RCI Evolution of the ratio of street lighting consumption to number of lighting points			
	Decarbonizing heating	2.2.1 2.2.3 4.2.1	Evolution of the number of coal-fired boilers Contribution of electricity to total final energy consumption in the residential and services sectors Evolution of the number of heat pumps			
	Reduced passenger	3.1.1	Evolution of traffic intensity			

	transportation need	3.1.2	Evolution of the mobility of private cars			
	Shift to public and non-motorized transport	3.2.1 3.2.2	Pedestrian mobility trends (weekdays, Saturdays, Sundays and public holidays) Developments in public transport mobility			
	Increase car pooling	3.2.5	Evolution of zero-emission carsharing (carpooling)			
	Optimise logistics	0.0.2 1.3.1	Annual emissions from light and heavy duty vehicles. Vehicle fleet study / emissions inventory. Total GHG emissions in the road transport sector			
	Electrification of the vehicle fleet: passenger	3.3.1	Evolution of ZERO passenger car registrations compared to			

	cars, taxis and buses	3.3.2 3.3.3	total registrations Evolution of ZERO taxis versus total number of taxis Evolution of ZERO buses compared to total buses (EMT)			
	Shift to renewable electricity	1.7.1 1.7.2	Evolution of the electricity emission factor (national level) Renewable electricity generation			
	Increasing recovery rates in the RCI sector	5.2.1 5.3.1	Evolution of the recovery rate in residential, services and municipal sectors Evolution of the total mass of bio-waste collected separately			
	Naturalise and reforest the municipality	1.6.1	Evolution of CO2 removals (sinks)			

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B-3.2: Indicator metadata	
Sector: Buildings and Heating and Cooling *Action / project / sub-sector: New buildings highly energy efficient*	
Indicator name	Total GHG emissions in the residential sector
Indicator unit	1.2.1
Definition	The disaggregation of emissions provides insight into the evolution of each sector of activity on its mitigation pathway and towards climate neutrality. *Expected trend: decreasing.* This indicator measures the sum of the annual evolution of the direct and indirect GHG emissions of the residential sector in the municipality of Madrid. The GHGs accounted for are as follows: CH4, CO2, HFCs, N2O, PFCs and SF6. Its trend is expected to be downward.
Method of calculation	Sum of direct emissions and indirect emissions, in the residential sector. Direct emissions are Scope 1 emissions, originating from within the city. Indirect emissions are the sum of Scope 2 emissions for electricity generation and Scope 3 emissions from electricity transmission losses. Measured in kilotonnes of CO2 equivalent (kt CO2eq).
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	Yes
If yes, to which area of emission is the co-benefit linked?	CDP 2022: Emissions Inventory Data (2.1d)
Does the indicator measure indirect impacts (i.e. co-benefits)?	No
If yes, what co-benefit do you measure?	N/A
Can the indicator be used to monitor impact pathways?	Yes

If yes, for which impact pathway?	New buildings highly energy efficient
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes CDP 2022: Emissions Inventory Data (2.1d)
Additional information	
Planned data source	Inventory of greenhouse gas emissions in the municipality of Madrid (1999-2020).
Planned availability	Annual
Planned collection interval	2015-2030
References	
Results describing the indicator	1.2.1 Emisiones totales GEI en el sector residencial Variables / Unidades / 2015 / 2016 / 2017 / 2018 / 2019 / 2020 Emisiones totales GEI / kt CO_2eq / 2.969 / 2.806 / 2.852 / 2.891 / 2.489 / 2.157 Indicador / kt CO_2eq / 2.969 / 2.806 / 2.852 / 2.891 / 2.489 / 2.157 Evolución indicador / (2015=100) / 100 / 94 / 96 / 97 / 84 / 73
Other indicator systems using this indicator	Decarbonizing heating

B-3.2: Indicator metadata	
Sector: Buildings and Heating and Cooling ***Action / project / sub-sector: New buildings highly energy efficient***	
Indicator name	Total GHG emissions services sector
Indicator unit	1.4.1
Definition	The disaggregation of emissions provides insight into the evolution of each sector of activity on its mitigation pathway and towards climate neutrality. *Expected trend: decreasing.* With this indicator, the sum of the annual evolution of the direct and indirect GHG emissions of the services sector in the municipality of Madrid is accounted for.

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	The GHGs accounted for are as follows: CH4, CO2, HFCs, N2O, PFCs and SF6. Its trend is expected to be downward.
Method of calculation	Sum of direct emissions and indirect emissions, in the services sector. Direct emissions are Scope 1 emissions, originating from within the city. Indirect emissions are in turn the sum of Scope 2 emissions for electricity generation and Scope 3 emissions from electricity transmission losses. Measured in kilotonnes of CO2 equivalent (kt CO2eq).
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	Yes
If yes, to which area of emission is the co-benefit linked?	CDP 2022: Emissions Inventory Data (2.1d)
Does the indicator measure indirect impacts (i.e. co-benefits)?	No
If yes, what co-benefit do you measure?	N/A
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	New buildings highly energy efficient
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes CDP 2022: Emissions Inventory Data (2.1d)
Additional information	
Planned data source	Inventory of greenhouse gas emissions in the municipality of Madrid (1999-2020).
Planned availability	Annual
Planned collection interval	2015-2030

References	
Results describing the indicator	1.4.1 Emisiones totales GEI en el sector servicios Variables / Unidades / 2015 / 2016 / 2017 / 2018 / 2019 / 2020 Emisiones totales GEI / kt CO_2eq / 2.890 / 2.494 / 2.706 / 2.725 / 2.178 / 1.591 **Indicador / kt CO_2eq / 2.890 / 2.494 / 2.706 / 2.725 / 2.178 / 1.591** Evolución indicador / (2015=100) / 100 / 86 / 94 / 94 / 75 / 55
Other indicator systems using this indicator	Decarbonizing heating

B-3.2: Indicator metadata	
Sector: Buildings and Heating and Cooling *Action / project / sub-sector: New buildings highly energy efficient*	
Indicator name	Final energy consumption in **RCI**
Indicator unit	0.0.1
Definition	Final energy consumption in the municipality of Madrid in the residential and services sectors. Its trend is expected to be downward.
Method of calculation	Sum of all energy products consumed in the residential and services sectors in the city of Madrid in 2020. In the first column of table 17 of the Energy Balance of the municipality of Madrid. Year 2020, the final energy consumption of the RCI sector (residential, commercial and institutional) is included. Measured in kilotonnes of oil equivalent (ktoe).
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No
If yes, to which area of emission is the co-benefit linked?	N/A
Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes

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If yes, what co-benefit do you measure?	GHG emission reduction Heat island effect attenuation Improving air quality Improved health Lower consumption, reduced energy costs in households and service sector
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	New buildings highly energy efficient
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes, partially considered. (3.1a) Report the total jurisdiction-wide annual electricity and heating and cooling consumption for each sector listed and for your government operations.
Additional information	
Planned data source	Energy balance of the municipality of Madrid. Year 2020
Planned availability	Annual
Planned collection interval	2006-2020
References	
Results describing the indicator	Table 17. Final energy consumption in the municipality of Madrid of the Energy balance of the municipality of Madrid. Year 2020

Año	RCI	
	ktep	%
2006	1.967,16	51,08
2007	2.012,16	51,29
2008	2.055,51	52,31
2009	2.057,99	54,21
2010	1.951,24	52,91
2011	1.867,44	52,63
2012	1.924,88	54,79
2013	1.890,57	55,99
2014	1.764,90	54,73
2015	1.745,94	54,14
2016	1.808,07	54,44
2017	1.738,05	53,29
2018	1.950,06	55,59
2019	1.861,08	54,47
2020	1.718,78	60,74

Other indicator systems using this indicator	Renewal of systems (light, electrical appliances, ...etc.)

B-3.2: *Indicator* metadata	
Sector: Buildings and Heating and Cooling ***Action / project / sub-sector: Building rehabilitation***	
Indicator name	Evolution of the number of rehabilitated dwellings.
Indicator unit	2.1.1
Definition	Evolution of the number of rehabilitated dwellings (within the framework of the Rehabilita Madrid Plan), with the aim of reducing the energy consumption of existing buildings, improving insulation and energy efficiency. Developing; the trend is expected to increase.
Calculation method	Number of dwellings rehabilitated annually, within the scope of the Rehabilita Madrid Plan. Measured in number of dwellings.
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No
If yes, to which area of emission is the co-benefit linked?	N/A
Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes
If yes, what co-benefit do you measure?	Reduction of energy expenditure in households. Promoting the use of new materials, technologies and products in the construction sector. Generation of new employment niches.

Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Building energy efficiency renovations
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes, paragraph 9, mitigation actions. Primary emissions sector addressed and action type^ Stationary energy Energy efficiency/ retrofit measures addressing existing commercial, residential and/or municipal buildings (p. 38)
Additional information	
Planned data source	Madrid City Council, AG. Urban Development
Planned availability	Annual
Planned collection interval	2015-2030
References	
Results describing the indicator	(pending receipt of data) 2.1.1 Evolución del número de viviendas rehabilitadas — Pendiente de recopilar dicha información por parte del AYUNTAMIENTO
Other indicator systems using this indicator	-

Variables	Unidades	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total de viviendas rehabilitadas	Nº de viviendas										
Indicador	**Nº de viviendas**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Evolución indicador	(2015=100)	0	0	0	0	0	0	0	0	0	0

B-3.2: Indicator metadata	
Sector: Buildings and Heating and Cooling ***Action / project / sub-sector: Building rehabilitation***	
Indicator name	Evolution of the rehabilitated surface area.
Indicator unit	2.1.2

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Definition	Evolution of the total surface area of rehabilitated dwellings (within the framework of the Rehabilita Madrid Plan), with the aim of reducing the consumption demand of existing buildings, improving insulation and energy efficiency. Developing; the trend is expected to increase.
Method of calculation	Total number of rehabilitated housing areas annually, within the scope of the Rehabilita Madrid Plan. Measured in square metres (m2).
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No
If yes, to which area of emission is the co-benefit linked?	N/A
Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes
If yes, what co-benefit do you measure?	Reduction of energy expenditure in households. Promoting the use of new materials, technologies and products in the construction sector. Generation of new employment niches.
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	**Building energy efficiency renovations**
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes, paragraph 9, mitigation actions. Primary emissions sector addressed and action type^ Stationary energy Energy efficiency/ retrofit measures addressing existing commercial, residential and/or municipal buildings (p. 38)
Additional information	
Planned data source	Madrid City Council, AG. Urban Development
Planned availability	Annual

Planned collection interval	**2015-2030**
References	
Results describing the indicator	(pending receipt of data) 2.1.2 Evolución de la superficie rehabilitada — Pendiente de recopilar dicha información por parte del AYUNTAMIENTO
Other indicator systems using this indicator	-

Variables	Unidades	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total de superficie rehabilitada	m2										
Indicador	m2	0	0	0	0	0	0	0	0	0	0
Evolución indicador	(2015=100)	0	0	0	0	0	0	0	0	0	0

B-3.2: Indicator metadata	
Sector: Buildings and Heating and Cooling *Action / project / sub-sector: Renovation of systems (light, appliances, ... etc.)*	
Indicator name	Evolution of the ratio of street lighting consumption to the number of lighting points.
Indicator unit	4.2.4
Definition	As an additional indicator, and in order to make the analysis more robust, the consumption of public street lighting has been selected as a function of how the number of lighting points varies. This indicator evaluates the evolution of the energy efficiency of municipal public lighting. Its trend is expected to be downward.
Method of calculation	Ratio of street lighting electricity consumption (KWh) to number of lighting points (number of points) Measured in kilowatt hours divided by the number of points (kWh / No. of points).
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No

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If yes, to which area of emission is the co-benefit linked?	N/A
Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes
If yes, what co-benefit do you measure?	Reduction of the city of Madrid's energy consumption and associated GHG emissions. Boosting innovation: Development of new energy-efficient technologies. Improving the quality of public space, social well-being and reducing light pollution.
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Renewal of systems (lighting, electrical appliances, ... etc.)
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	No
Additional information	
Planned data source	Madrid City Council database
Planned availability	Annual
Planned collection interval	2015-2030
References	
Results describing the indicator	4.2.4 Evolución de la relación consumo de alumbrado público vial y número de puntos de alumbrado

Variables	Unidades	2015	2016	2017	2018	2019	2020	2021
Consumo eléctrico	kWh	106.498.000	91.859.301	88.998.170	89.534.293	87.923.221	88.448.628	90.062.505
Puntos de alumbrado	Nº de puntos	254.802	255.899	256.925	257.411	255.363	258.813	260.241
Indicador	**kWh/Nº de puntos**	**418**	**359**	**346**	**348**	**344**	**342**	**346**
Evolución indicador	(2015=100)	100	86	83	83	82	82	83

Other indicator systems using this indicator	-

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B-3.2: Indicator metadata	
Sector: Buildings and Heating and Cooling *Action / project / sub-sector: Decarbonizing heating*	
Indicator name	Evolution of the number of coal-fired boilers.
Indicator unit	2.2.1
Definition	Coal-fired boilers are highly polluting and intensive in CO2 emissions and, in recent years, Madrid City Council has taken measures to replace them with other less emissive technologies. Expected trend: downward.
Method of calculation	Total annual number of reductions in coal-fired boiler installations, within the scope of the Rehabilita Madrid Plan. Measured in number of installations (No. Installations).
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No
If yes, to which area of emission is the co-benefit linked?	N/A
Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes
If yes, what co-benefit do you measure?	Improvement of air quality. Reduction of GHG emissions in the residential sector. Boosting innovation in the air-conditioning sector and ACS production.
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Decarbonizing heating

Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes (3.1) Report the total annual electricity and heating and cooling consumption data (in MWh) and the percentage breakdown of this consumption by energy type for your jurisdiction. Percentage of total consumption from coal. (p. 13-14) 6. Sector Targets (6.1) Provide details of your jurisdiction's energy-related targets active in the reporting year. In addition, you can report other climate-related targets active in the reporting year. Target description Remove all remaining coal-fired boilers by 2022. (p. 24-25)
Additional information	
Planned data source	Emission Inventory - Coal-fired boilers census
Planned availability	Annual
Planned collection interval	2015-2030
References	
Results describing the indicator	2.2.1 Evolución del número de calderas de carbón **Variables** / **Unidades** / 2015 / 2016 / 2017 / 2018 / 2019 / 2020 Calderas de carbón / Nº de instalaciones / 482 / 438 / 394 / 353 / 316 / 283 **Indicador** / **Nº de instalaciones** / **482** / **438** / **394** / **353** / **316** / **283** Evolución indicador / (2015=100) / 100 / 91 / 82 / 73 / 66 / 59
Other indicator systems using this indicator	-

B-3.2: Indicator metadata	
Sector: Buildings and Heating and Cooling ***Action / project / sub-sector: Decarbonizing heating***	
Indicator name	Contribution of electricity to total final energy consumption in the residential and services sectors
Indicator unit	2.2.3

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<table>
<tr><td>Definition</td><td>The contribution of electricity to final energy consumption in the residential and services sector has been decided to monitor as an indicator of the degree of electrification and how this energy source can replace the final consumption of fossil energy sources.
Expected trend: increasing.</td></tr>
<tr><td>Calculation method</td><td>The first column of Table 8 of the Energy Balance of the municipality of Madrid, year 2020, shows the electricity consumption of the RCI sector (residential, commercial and institutional) for the year 2020, in terms of percentage contribution (50.61%) with respect to total consumption.
Measured as a percentage (%).

Tabla 8. Contribución de cada fuente energética al consumo de energía de cada sector (%). Año 2020
<table>
<tr><th></th><th>RCI</th><th>Industria</th><th>Transporte rodado</th><th>Otros modos de transporte</th><th>Tratamiento de residuos urbanos</th><th>Tratamiento de aguas residuales</th><th>TOTAL</th></tr>
<tr><td>Biomasa</td><td>0,46</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,28</td></tr>
<tr><td>Gas natural[7]</td><td>37,45</td><td>70,82</td><td>7,69</td><td>0,00</td><td>0,00</td><td>48,66</td><td>29,58</td></tr>
<tr><td>PP</td><td>9,92</td><td>2,82</td><td>87,95</td><td>70,69</td><td>1,76</td><td>0,00</td><td>33,04</td></tr>
<tr><td>GLP</td><td>2,55</td><td>0,52</td><td>1,63</td><td>0,00</td><td>1,76</td><td>0,00</td><td>1,99</td></tr>
<tr><td>Gasolinas</td><td>0,00</td><td>0,00</td><td>27,36</td><td>0,00</td><td>0,00</td><td>0,00</td><td>6,83</td></tr>
<tr><td>Gasóleo A</td><td>0,00</td><td>0,00</td><td>57,42</td><td>0,00</td><td>0,00</td><td>0,00</td><td>14,34</td></tr>
<tr><td>Gasóleo B</td><td>0,00</td><td>0,00</td><td>0,00</td><td>20,34</td><td>0,00</td><td>0,00</td><td>1,40</td></tr>
<tr><td>Gasóleo C</td><td>7,37</td><td>2,05</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>4,60</td></tr>
<tr><td>Fuelóleo</td><td>0,00</td><td>0,25</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,02</td></tr>
<tr><td>Queroseno</td><td>0,00</td><td>0,00</td><td>0,00</td><td>50,35</td><td>0,00</td><td>0,00</td><td>3,47</td></tr>
<tr><td>ETBE</td><td>0,00</td><td>0,00</td><td>1,50</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,37</td></tr>
<tr><td>MTBE</td><td>0,00</td><td>0,00</td><td>0,05</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,01</td></tr>
<tr><td>Biocarburantes</td><td>0,00</td><td>0,00</td><td>4,32</td><td>0,00</td><td>0,00</td><td>0,00</td><td>1,08</td></tr>
<tr><td>Biodiesel</td><td>0,00</td><td>0,00</td><td>4,32</td><td>0,00</td><td>0,00</td><td>0,00</td><td>1,08</td></tr>
<tr><td>Bioetanol</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td></tr>
<tr><td>Electricidad</td><td>50,61</td><td>26,35</td><td>0,04</td><td>29,31</td><td>98,24</td><td>51,34</td><td>35,08</td></tr>
<tr><td>Electricidad (red)</td><td>50,58</td><td>25,62</td><td>0,04</td><td>29,31</td><td>0,00</td><td>17,98</td><td>34,53</td></tr>
<tr><td>Autoconsumos en generadores</td><td>0,03</td><td>0,74</td><td>0,00</td><td>0,00</td><td>98,24</td><td>33,36</td><td>0,55</td></tr>
<tr><td>Carbón</td><td>0,52</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,32</td></tr>
<tr><td>Solar térmica</td><td>0,90</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,55</td></tr>
<tr><td>Geotérmica</td><td>0,14</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,09</td></tr>
<tr><td>Hidrógeno</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td><td>0,00</td></tr>
<tr><td>TOTAL</td><td>100,00</td><td>100,00</td><td>100,00</td><td>100,00</td><td>100,00</td><td>100,00</td><td>100,00</td></tr>
</table></td></tr>
<tr><td>Context</td><td></td></tr>
<tr><td>Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?</td><td>No</td></tr>
<tr><td>If yes, to which area of emission is the co-benefit linked?</td><td>N/A</td></tr>
<tr><td>Does the indicator measure indirect impacts (i.e. co-benefits)?</td><td>Yes</td></tr>
<tr><td>If yes, what co-benefit do you measure?</td><td>Improvement of air quality.
Reduction of GHG emissions in the residential sector.
Boosting innovation in the market for household appliances, lighting, home automation, air conditioning, etc.
Boosting the development of photovoltaic production.</td></tr>
</table>

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Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Decarbonizing heating
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes, partially. (3.1a) Report the total jurisdiction-wide annual electricity and heating and cooling consumption for each sector listed and for your government operations. (3.2) For each type of renewable energy within the jurisdiction boundary, report the installed capacity (MW) and annual generation (MWh). (p. 15)
Additional information	
Planned data source	Energy balance of the municipality of Madrid. Year 2020
Planned availability	Annual
Planned collection interval	2015-2030
References	
Results describing the indicator	2.2.3 Contribución de la energía eléctrica al total de consumo de energía final en los sectores residencial y servicios (se va a estudiar la posibilidad de una desagregación entre Residencial y Comercial-Institucional próximamente)
Other indicator systems using this indicator	-

Variables	Unidades	2015	2016	2017	2018	2019	2020
Consumo electricidad RCI	ktep	933	928	909	988	951	869
Consumo de energía final RCI	ktep	1.746	1.808	1.738	1.950	1.861	1.719
Indicador	**%**	**53,5**	**51,3**	**52,3**	**50,7**	**51,1**	**50,6**
Evolución indicador	(2015=100)	100	96	98	95	96	95

B-3.2: Indicator metadata	
Sector: Buildings and Heating and Cooling *Action / project / sub-sector: Decarbonizing heating*	
Indicator name	Evolution of the number of **heat** pumps

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Indicator unit	4.2.1
Definition	The incorporation of heat pumps in air conditioning and DHW systems, replacing combustion installations (coal, diesel, LPG, etc.), will reduce the impact in terms of GHG emissions and improve energy efficiency in the residential and services sectors. Developing; the trend is expected to increase.
Calculation method	Annual evolution of the stock of heat pump installations in the residential and services sectors. Measured in number of installations.
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No
If yes, to which area of emission is the co-benefit linked?	N/A
Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes
If yes, what co-benefit do you measure?	Improvement of air quality. Reduction of GHG emissions in the residential sector. Boosting innovation in the home automation and air conditioning market. Promoting the implementation of photovoltaic generation systems.
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Decarbonizing heating
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes (9.1) Describe the outcomes of the most significant mitigation actions your jurisdiction is currently undertaking. Note that this can include those in the planning and/or implementation phases. (p. 37) Stationary energy Domestic and/or commercial heat network. Action description and web link to further information. The penetration of heat pump to replace conventional air conditioning

	systems (combustion and electrical) is essential given the high energy efficiency of these systems. In the residential sector, this measure would involve the annual introduction of 12,000 new heat pumps, as well as about 50,000 boiler renovations. (p. 37-38)
Additional information	
Planned data source	Community of Madrid
Planned availability	Annual
Planned collection interval	(2015-2030)
References	
Results describing the indicator	(pending receipt of data) 4.2.1 Evolución de número de bombas de calor Variables / Unidades / 2015 / 2016 / 2017 / 2018 / 2019 / 2020 Total de bombas de calor / Nº de instalaciones **Indicador / Nº de instalaciones / 0 / 0 / 0 / 0 / 0 / 0** Evolución indicador / (2015=100) / 0 / 0 / 0 / 0 / 0 / 0
Other indicator systems using this indicator	-

B-3.2: Indicator metadata	
Sector: Transport *Action / project / sub-sector: Reduce the need for personal mobility*	
Indicator name	Evolution of traffic intensity
Indicator unit	3.1.1
Definition	Traffic intensity provides information on the volume of vehicle movements in the municipality in a given period. In this case, traffic intensity has been expressed as average daily intensity (ADI) on working days and annual average.

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	The expected trend is downward, although this is an informative indicator that has to be assessed in conjunction with other indicators in the road traffic sector.
Method of calculation	Ratio of total average daily intensity on working days, annual average (IMD) in No. of vehicles / day, divided by 1,000. Measured in Thousands of vehicles / day.
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No
If yes, to which area of emission is the co-benefit linked?	N/A
Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes
If yes, what co-benefit do you measure?	Reduction of GHG emissions. Improvement of air quality. Reduction of noise pollution. Improving the quality of public space.
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Reduced passenger transportation need
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	No
Additional information	
Planned data source	Madrid City Council's Open Data Portal
Planned availability	Annual
Planned collection interval	2015-2030
References	

Results describing the indicator	3.1.1 Evolución de la intensidad de tráfico Variables / Unidades / 2015 / 2016 / 2017 / 2018 / 2019 / 2020 / 2021 IMD total en días laborables, promedio anual / Nº de vehículos / día / 2.184.498 / 2.168.029 / 2.134.500 / 2.093.783 / 2.061.344 / 1.488.429 / 1.794.106 **Indicador / Miles de vehículos / día / 2.184 / 2.168 / 2.135 / 2.094 / 2.061 / 1.488 / 1.794** Evolución indicador / (2015=100) / 100 / 99 / 98 / 96 / 94 / 68 / 82
Other indicator systems using this indicator	Optimise logistics

B-3.2: Indicator metadata	
Sector: Transport ***Action / project / sub-sector: Reduce the need for personal mobility***	
Indicator name	Evolution of the mobility of private cars
Indicator unit	3.1.2
Definition	The data concerning the mobility of private tourism has been selected for monitoring as an indicator because it effectively illustrates the transport situation in the municipality. Therefore, they are very useful for the adoption of measures aimed at modal shifts. The expected trend is downward, although this is an informative indicator that has to be assessed in conjunction with other indicators in the road traffic sector.
Calculation method	Ratio of annual private car journeys in thousands of vehicles per km/year, divided by 1,000. Measured in Millions of vehicles x km / year.
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No
If yes, to which area of emission is the co-benefit linked?	N/A
Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes

If yes, what co-benefit do you measure?	Reduction of GHG emissions. Improvement of air quality. Reduction of noise pollution. Improving the quality of public space.
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Reduced passenger transportation need
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes (3.5) Report your jurisdiction's passenger and/or freight mode share data. (p. 16) Passenger mode share: Private motorized transport (p. 17)
Additional information	
Planned data source	Emission inventory, with data from the Traffic Model and the Vehicle Fleet Study.
Planned availability	Annual
Planned collection interval	2015-2030
References	
Results describing the indicator	3.1.2 Evolución de la movilidad de turismos privados **Variables** / **Unidades** / **2015** / **2016** / **2017** / **2018** / **2019** Recorridos anual de turismos privados / Miles de veh*km / año / 12.327.278 / 12.289.696 / 12.443.207 / 12.248.607 / 12.120.547 **Indicador** / **Millones de veh*km / año** / **12.327** / **12.290** / **12.443** / **12.249** / **12.121** Evolución indicador / (2015=100) / 100 / 100 / 101 / 99 / 98
Other indicator systems using this indicator	-

B-3.2: Indicator metadata
Sector: Transport *Action / project / sub-sector: Shift to public and non-motorized transport*

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Indicator name	Pedestrian mobility trends (weekdays, Saturdays and Sundays and public holidays)
Indicator unit	3.2.1
Definition	Pedestrian mobility has been selected as an indicator as it provides key information on the sustainability of mobility in the municipality. The series starts in 2019, the year in which the pedestrian mobility sampling points were put into operation. Expected trend: increasing.
Method of calculation	There are three indicators of the evolution of pedestrian mobility. According to: - Working days: calculated by taking the total average number of working days (Persons/day), divided by 1,000. - Saturdays: calculated by taking the total average on Saturdays (Persons/day), divided by 1,000. - Sundays and public holidays: calculated by taking the total average on Sundays and public holidays (Persons/day), divided by 1,000. Measured in thousands of people / day.
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No
If yes, to which area of emission is the co-benefit linked?	N/A
Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes
If yes, what co-benefit do you measure?	Reduction of GHG emissions. Improvement of air quality. Reduction of noise pollution. Improving the quality of public space. Improve public health.
Can the indicator be used to monitor impact pathways?	Yes

If yes, for which impact pathway?	Shift to public and non-motorized transport
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes, partially. (3.5) Report your jurisdiction's passenger and/or freight mode share data. (p. 16) Passenger mode share: Walking (p. 17)
Additional information	
Planned data source	Madrid City Council's Open Data Portal Madrid City Council Transparency Portal Mobility 2020 Report
Planned availability	Annual
Planned collection interval	2015-2030
References	
Results describing the indicator	3.2.1 Evolución de la movilidad peatonal (días laborables, sábados y domingos y festivos)

Variables	Unidades	2015	2016	2017	2018	2019	2020
Media total en días laborables	Personas/día	0	0	0	0	2.193.982	1.426.707
Media total en sábados	Personas/día	0	0	0	0	3.041.111	1.900.451
Media total en días festivos	Personas/día	0	0	0	0	2.603.635	1.585.263
Indicador laborables	**Miles de Personas/día**	**0**	**0**	**0**	**0**	**2.194**	**1.427**
Indicador sábados	**Miles de Personas/día**	**0**	**0**	**0**	**0**	**3.041**	**1.900**
Indicador festivos	**Miles de Personas/día**	**0**	**0**	**0**	**0**	**2.604**	**1.585**
Evolución indicador laborables	(2019=100)*	0	0	0	0	100	65
Evolución indicador sábados	(2019=100)*	0	0	0	0	100	62
Evolución indicador festivos	(2019=100)*	0	0	0	0	100	61

*Consultar apartado de observaciones

Other indicator systems using this indicator	-

B-3.2: Indicator metadata	
Sector: Transport ***Action / project / sub-sector: Shift to public and non-motorized transport***	
Indicator name	Developments in public transport mobility

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Indicator unit	3.2.2
Definition	Public transport is a fundamental part of the municipal mobility model, so it has been decided to include its evolution as an indicator of transport sustainability. To this end, the users of the main public transport services available (metro, suburban and EMT buses) have been grouped together. Expected trend: increasing.
Calculation method	Total number of users/year, EMT, Metro and Renfe, divided by one million. Measured in millions of users / year.
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No
If yes, to which area of emission is the co-benefit linked?	N/A
Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes
If yes, what co-benefit do you measure?	Reduction of GHG emissions. Improvement of air quality. Reduction of noise pollution. Improving the quality of public space.
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Shift to public and non-motorized transport
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes, partially. (3.5) Report your jurisdiction's passenger and/or freight mode share data. (p. 16) Passenger mode share: Rail/Metro/Tram/ Passenger mode share: Buses (including Bus Rapid Transit) (Page 17)
Additional information	

Planned data source	EMT Report / Madrid City Council Databank Metro Report / Madrid City Council's Data Bank Renfe / Madrid City Council Data Bank Report
Planned availability	Annual
Planned collection interval	2015-2030
References	
Results describing the indicator	3.2.2 Evolución de la movilidad en el transporte público Variables / Unidades / 2015 / 2016 / 2017 / 2018 / 2019 / 2020 / 2021 Movilidad EMT / Nº de usuarios /año / 405.923.000 / 430.109.000 / 427.931.000 / 420.197.000 / 439.787.000 / 241.561.000 / 162.642.000 Movilidad Metro / Nº de usuarios /año / 575.973.000 / 586.032.000 / 631.660.000 / 662.882.000 / 683.336.000 / 352.568.000 / 264.271.000 Movilidad Renfe / Nº de usuarios /año / 157.140.110 / 160.079.031 / 166.287.535 / 175.760.009 / 171.912.087 / 93.654.871 / 80.073.009 **Indicador / Nº de usuarios (millones) / año / 1.139 / 1.176 / 1.226 / 1.259 / 1.295 / 688 / 507** Evolución indicador / (2015=100) / 100 / 103 / 108 / 111 / 114 / 60 / 45
Other indicator systems using this indicator	-

B-3.2: Indicator metadata	
Sector: Transport ***Action / project / sub-sector: Increase transport sharing modes***	
Indicator name	Evolution of zero-emission car sharing (carsharing or carpooling)
Indicator unit	3.2.5
Definition	Percentage of electric car sharing vehicles, in terms of journeys, on a typical day. Its trend is expected to increase.
Calculation method	It is part of the study of the vehicle fleet according to the European methodology EMEP / EEA CORINAIR (COPERT Model).
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No

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If yes, to which area of emission is the co-benefit linked?	N/A
Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes
If yes, what co-benefit do you measure?	Improvement of the mobility system in the city and metropolitan area. Reduction of GHG emissions. Improvement of air quality. Promoting new business models in the mobility and automotive sector.
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Increase carpooling
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	No
Additional information	
Planned data source	Circulating stock study
Planned availability	Biannual
Planned collection interval	2022-2030
References	
Results describing the indicator	(pending receipt of data) Cuestiones pendientes: 3.2.5 Evolución del vehículo compartido cero emisiones (carsharing o carpooling) Pendiente de recopilar dicha información por parte del AYUNTAMIENTO
Other indicator systems using this indicator	-

Variables	Unidades	2015	2016	2017	2018	2019	2020	2021	2022
Indicador		0	0	0	0	0	0	0	0
Evolución indicador	(2015=100)	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!

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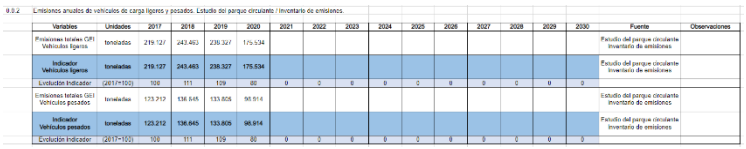
B-3.2: Indicator metadata	
Sector: Transport *Action / project / sub-sector: Optimise logistics*	
Indicator name	Annual emissions from light and heavy duty vehicles. Vehicle fleet study / emissions inventory.
Indicator unit	0.0.2
Definition	Total annual GHG emissions from the fleet of light and heavy goods vehicles operating in the city of Madrid. Its trend is expected to be constant or decreasing.
Method of calculation	It is part of the study of the vehicle fleet and the emissions inventory of the city of Madrid, in accordance with the European methodology EMEP / EEA CORINAIR (COPERT Model). Measured in kilotonnes of CO2 equivalent (kt CO2eq).
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	Yes
If yes, to which area of emission is the co-benefit linked?	(2.1d) Provide a breakdown of your community-wide emissions in the format of the Common Reporting Framework. Transportation > On-road (p. 11 - 12)
Does the indicator measure indirect impacts (i.e. co-benefits)?	No
If yes, what co-benefit do you measure?	N/A
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Optimise logistics

Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Indirectly, it is part of the emission estimation for traffic (Transportation > On-road). (2.1d) Provide a breakdown of your community-wide emissions in the format of the Common Reporting Framework. (p. 11 - 12)
Additional information	
Planned data source	Vehicle fleet study / emissions inventory.
Planned availability	Annual
Planned collection interval	2017-2030
References	
Results describing the indicator	
Other indicator systems using this indicator	-

B-3.2: Indicator metadata	
Sector: Transport ***Action / project / sub-sector: Optimise logistics***	
Indicator name	Total GHG emissions in the road transport sector
Indicator unit	1.3.1
Definition	The disaggregation of emissions provides insight into the evolution of each sector of activity on its mitigation pathway and towards climate neutrality. Expected trend: downward.
Calculation method	It is obtained by taking the value of total greenhouse gas emissions, in the Road Transport column.

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<table>
<tr><td></td><td>Measured in kilotonnes of CO2 equivalent (kt CO2eq).

Tabla 10. Distribución por sectores de las emisiones directas e indirectas de GEI en Madrid (año 2020)
<table><tr><th>Emisiones</th><th>RCI</th><th>Industria*</th><th>Transporte por carretera</th><th>Otros modos de transporte</th><th>Tratamiento y eliminación de residuos**</th><th>Otros***</th><th>TOTAL</th></tr><tr><td colspan="8">kt CO_2 eq</td></tr><tr><td>Directas</td><td>2.035,4</td><td>561,1</td><td>1.926,5</td><td>415,2</td><td>710,5</td><td>341,4</td><td>5.990,0</td></tr><tr><td>Indirectas</td><td>1.712,6</td><td>91,6</td><td>1,2</td><td>112,6</td><td>7,6</td><td>0,0</td><td>1.925,6</td></tr><tr><td>TOTALES</td><td>3.748,0</td><td>652,7</td><td>1.927,7</td><td>527,7</td><td>718,1</td><td>341,4</td><td>7.915,6</td></tr><tr><td colspan="8">Contribución por sectores (%)</td></tr><tr><td>Directas</td><td>34,0</td><td>9,4</td><td>32,2</td><td>6,9</td><td>11,9</td><td>5,7</td><td>100</td></tr><tr><td>Indirectas</td><td>88,9</td><td>4,8</td><td>0,1</td><td>5,8</td><td>0,4</td><td>0,0</td><td>100</td></tr><tr><td>TOTALES</td><td>47,3</td><td>8,2</td><td>24,4</td><td>6,7</td><td>9,1</td><td>4,3</td><td>100</td></tr></table></td></tr>
<tr><td>Context</td><td></td></tr>
<tr><td>Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?</td><td>Yes</td></tr>
<tr><td>If yes, to which area of emission is the co-benefit linked?</td><td>(2.1d) Provide a breakdown of your community-wide emissions in the format of the Common Reporting Framework.
(p. 11)
Transportation > On-road^
(p. 12)</td></tr>
<tr><td>Does the indicator measure indirect impacts (i.e. co-benefits)?</td><td>No</td></tr>
<tr><td>If yes, what co-benefit do you measure?</td><td>N/A</td></tr>
<tr><td>Can the indicator be used to monitor impact pathways?</td><td>Yes</td></tr>
<tr><td>If yes, for which impact pathway?</td><td>Optimise logistics</td></tr>
<tr><td>Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?</td><td>Yes
(2.1d) Provide a breakdown of your community-wide emissions in the format of the Common Reporting Framework.
(p. 11)
Transportation > On-road^
(p. 12)</td></tr>
<tr><td>Additional information</td><td></td></tr>
<tr><td>Planned data source</td><td>Inventory of greenhouse gas emissions in the municipality of Madrid. Year 2020</td></tr>
</table>

Planned availability	Annual
Planned collection interval	2015-2030
References	
Results describing the indicator	1.3.1 Emisiones totales GEI en el sector transporte rodado Variables / Unidades / 2015 / 2016 / 2017 / 2018 / 2019 / 2020 Emisiones totales GEI / kt CO_2eq / 2.725 / 2.694 / 2.737 / 2.653 / 2.591 / 1.928 **Indicador / kt CO_2eq / 2.725 / 2.694 / 2.737 / 2.653 / 2.591 / 1.928** Evolución indicador / (2015=100) / 100 / 99 / 100 / 97 / 95 / 71
Other indicator systems using this indicator	-

B-3.2: Indicator metadata	
Sector: Transport ***Action / project / sub-sector: Electrification of passenger cars***	
Indicator name	Evolution of ZERO passenger car registrations compared to total registrations
Indicator unit	3.3.1
Definition	This indicator shows the proportion of cars with the DGT "0 emissions" badge, the most efficient and environmentally friendly, with respect to the total number of cars registered in the municipality. Expected trend: increasing.
Method of calculation	It is obtained by taking the number of ZERO passenger car registrations in a year multiplied by 100, and divided by the total number of passenger car registrations in a year. Measured as a percentage (%).
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No
If yes, to which area of emission is the co-benefit linked?	N/A

Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes
If yes, what co-benefit do you measure?	Penetration of new zero-emission technologies in the city's vehicle fleet.
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Electrification of the vehicle fleet: passenger cars, taxis and **buses**
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes (3.6) Report the total emissions, fleet size and number of vehicle types for the following modes of transport. (p. 17)
Additional information	
Planned data source	DGT Statistical Tables - Registrations (Provincial data)
Planned availability	Annual
Planned collection interval	2015-2030
References	
Results describing the indicator	3.3.1 Evolución de matriculaciones de turismos CERO frente al total de matriculaciones **Variables** / **Unidades** / **2015** / **2016** / **2017** / **2018** / **2019** / **2020** Turismos CERO matriculados / Nº de matriculaciones / año / 0 / 0 / 3.139 / 5.155 / 8.140 / 18.576 Total turismos matriculados / Nº de matriculaciones / año / 313.987 / 349.909 / 382.701 / 400.938 / 385.237 / 307.495 **Indicador** / **%** / **0,00** / **0,00** / **0,82** / **1,29** / **2,11** / **6,04** Evolución indicador / (2017=100) / 0 / 0 / 100 / 157 / 258 / 737 *Consultar apartado de observaciones
Other indicator systems using this indicator	-

B-3.2: Indicator metadata
Sector: Transport *Action / project / sub-sector: Electrification of the vehicle fleet: taxis*

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Indicator name	Evolution of ZERO taxis versus total number of taxis
Indicator unit	3.3.2
Definition	The ratio of ZERO taxis to the total fleet in the municipality has been identified as a suitable indicator to monitor the shift of the sector towards less emitting alternatives. Expected trend: increasing.
Method of calculation	It is obtained by taking the number of ZERO taxi vehicles in a year multiplied by one hundred, and divided by the total number of taxi vehicles in a year. Measured as a percentage (%).
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No
If yes, to which area of emission is the co-benefit linked?	N/A
Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes
If yes, what co-benefit do you measure?	Penetration of new zero emission technologies in the city's taxi fleet.
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Electrification of the vehicle fleet: passenger cars, taxis and buses
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes (3.6) Report the total emissions, fleet size and number of vehicle types for the following modes of transport. (p. 17)
Additional information	
Planned data source	Madrid City Council's Open Data Portal - Daily and historical taxi fleet
Planned availability	Annual

Planned collection interval	2015-2030
References	
Results describing the indicator	3.3.2 Evolución de taxis CERO frente al total de taxis Variables / Unidades / 2015 / 2016 / 2017 / 2018 / 2019 / 2020 / 2021 Taxis CERO — Nº de vehículos — 0 / 0 / 2 / 11 / 23 / 35 / 126 Total taxis — Nº de vehículos — - / - / 12.562 / 14.153 / 16.614 / 15.528 / 15.106 **Indicador — % — 0,00 / 0,00 / 0,02 / 0,08 / 0,14 / 0,23 / 0,83** Evolución indicador — (2017=100) — 0 / 0 / 100 / 488 / 870 / 1.416 / 5.239 *Consultar apartado de observaciones
Other indicator systems using this indicator	-

B-3.2: Indicator metadata	
Sector: Transport ***Action / project / sub-sector: Electrification of buses***	
Indicator name	Evolution of ZERO buses compared to total buses (EMT)
Indicator unit	3.3.3
Definition	The proportion of ZERO buses in the fleet of the Empresa Municipal de Transportes allows to know the evolution of this municipal fleet in terms of the introduction of less emitting vehicles. Expected trend: increasing.
Method of calculation	It is obtained by taking the number of ZERO bus vehicles in a year multiplied by one hundred, and divided by the total number of bus vehicles in a year. Measured as a percentage (%).
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No
If yes, to which area of emission is the co-benefit linked?	N/A

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Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes
If yes, what co-benefit do you measure?	Penetration of new zero emission technologies in the city's bus fleet.
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Electrification of the vehicle fleet: passenger cars, taxis and buses
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes (3.6) Report the total emissions, fleet size and number of vehicle types for the following modes of transport. (p. 17)
Additional information	
Planned data source	EMT Report - Bus fleet
Planned availability	Annual
Planned collection interval	2015-2030
References	
Results describing the indicator	3.3.3 Evolución autobuses CERO frente al total autobuses (EMT)

Variables	Unidades	2015	2016	2017	2018	2019	2020
Autobuses CERO	Nº de vehículos	0	28	32	48	65	75
Total autobuses	Nº de vehículos	-	1.967	2.184	2.408	2.312	2.182
Indicador	**%**	**0,00**	**1,42**	**1,47**	**1,99**	**2,81**	**3,44**
Evolución indicador	(2016=100)	0	100	103	140	198	241

*Consultar apartado de observaciones

Other indicator systems using this indicator	-
B-3.2: Indicator metadata	
Sector: Electricity ***Action / project / sub-sector: Shift to renewable electricity***	
Indicator name	Evolution of the electricity emission factor (national level)

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Indicator unit	1.7.1
Definition	The electricity emission factor expresses the CO2 emissions associated with the generation of electricity consumed in a given territory and therefore determines the indirect GHG emissions associated with the consumption of this energy source. It provides an overview of the energy sources and generation technologies involved in electricity production. It is a value at the national level. Expected trend: downward.
Method of calculation	It is obtained by taking the value of the GHG emissions inventory of the municipality of Madrid. Table 4 of the Inventory of GHG emissions in the municipality of Madrid. Year 2020, shows the resulting emission factors used to estimate these indirect emissions. Measured in tonnes of CO2 between megawatt hours (tCO2/MWh).
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	Yes
If yes, to which area of emission is the co-benefit linked?	Linked to the reduction of GHG emissions in the residential, services and transport sectors.
Does the indicator measure indirect impacts (i.e. co-benefits)?	No
If yes, what co-benefit do you measure?	N/A
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Shift to renewable electricity
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	No
Additional information	

Planned data source	Inventory of GHG emissions in the municipality of Madrid. Year 2020. Original information from REE
Planned availability	Annual
Planned collection interval	2015-2030
References	
Results describing the indicator	1.7.1 Evolución del factor de emisión eléctrico (nivel nacional) Variables / Unidades / 2015 / 2016 / 2017 / 2018 / 2019 / 2020 FE / tCO_2/MWh / 0,348 / 0,284 / 0,326 / 0,283 / 0,221 / 0,170 Indicador / tCO_2/MWh / 0,348 / 0,284 / 0,326 / 0,283 / 0,221 / 0,170 Evolución indicador / (2015=100) / 100 / 82 / 94 / 81 / 64 / 49
Other indicator systems using this indicator	-

B-3.2: Indicator metadata	
Sector: Electricity ***Action / project / sub-sector: Shift to renewable electricity***	
Indicator name	Renewable electricity generation
Indicator unit	1.7.2
Definition	Renewable energy generation has been set as an indicator to monitor the inclusion of non-GHG emitting technologies in the production of electricity within the municipality of Madrid. For its calculation, photovoltaic generation is considered, as well as electricity generation from sewage sludge biogas, landfill biogas, biomethanisation biogas, and municipal waste incineration, in its renewable part. Expected trend: increasing.
Method of calculation	Sum of the gross electricity produced from the following own sources: Solar photovoltaic, biogas from biomethanisation, landfill biogas + biomethanisation and incineration. Rounded to whole units, measured in ktoe. in table 3 of the Energy Balance of the municipality of Madrid, Year 2020. Measured in kilotonnes of oil equivalent (ktoe).

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	Tabla 3. Energía eléctrica producida a partir de fuentes propias en el municipio de Madrid. Año 2020

Fuentes energéticas propias	GWh			ktep		
	Bruta	Venta	Autoconsumo	Bruta	Venta	Autoconsumo
Residuos urbanos (RU)						
Incineración (Las Lomas)	226,72	165,18	61,54	19,49	14,20	5,29
Biogás de vertedero + biogás de biometanización (La Galiana)	85,35	71,17	14,19	7,34	6,12	1,22
Lodos de EDAR						
Biogás de biometanización	73,44	0,00	73,44	6,31	0,00	6,31
Solar fotovoltaica	21,62	21,62	0,00	1,86	1,86	0,00
TOTAL	**407,13**	**257,96**	**149,17**	**35,01**	**22,18**	**12,83**

Fuente: elaboración propia a partir de datos del Ayuntamiento de Madrid, Comunidad de Madrid, Comisión Nacional de los Mercados y la Competencia, y Canal de Isabel II.

Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No
If yes, to which area of emission is the co-benefit linked?	N/A
Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes
If yes, what co-benefit do you measure?	Generation of electricity within the city and reduction of imports. Reduction of the emission factor of the city's electricity system.
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Shift to renewable electricity
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes, partially. 3.2) For each type of renewable energy within the jurisdiction boundary, report the installed capacity (MW) and annual generation (MWh). (Page 15)
Additional information	
Planned data source	Energy Balance of the municipality of Madrid. Year 2020
Planned availability	Annual
Planned collection interval	2015-2030

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References	
Results describing the indicator	1.7.2 Generación eléctrica renovable

Variables	Unidades	2015	2016	2017	2018	2019	2020
Fotovoltaica	ktep	2	2	2	2	2	2
Biogas de lodos EDAR	ktep	6	7	6	6	7	6
Biogás de vertedero + Biometanización	ktep	5	5	6	7	8	7
Incineración renovable	ktep	9	10	10	9	10	19
Indicador	**ktep**	**22**	**23**	**24**	**24**	**26**	**35**
Generación total asociada a residuos	ktep	14	14	16	16	18	27
Evolución indicador	(2015=100)	100	102	109	107	118	156

Other indicator systems using this indicator	-

B-3.2: Indicator metadata	
Sector: Waste and reforestation *Action / project / sub-sector: Increase recovery rates of the RCI sector*	
Indicator name	Evolution of the recovery rate in residential, services and municipal sectors
Indicator unit	5.2.1
Definition	The recovery rate represents the amount of waste that is recovered for subsequent recycling (or reuse). This indicator is established for the fractions "light packaging" and "residual" as a whole. Expected trend: increasing.
Method of calculation	This is the annual result of the sum of the waste recovered from the fractions Light packaging + residual waste, divided by the sum of the incoming waste from the fractions Light packaging + residual waste, from the waste treatment and sorting centres of La Paloma, Las Dehesas and Las Lomas. Measured as a percentage (%).
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No

If yes, to which area of emission is the co-benefit linked?	N/A
Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes
If yes, what co-benefit do you measure?	Reduction of raw material consumption. Use of recycled material for industrial uses. Boosting the circular economy.
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Increasing recovery rates in the RCI sector
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes, partially. (3.7) Report the following waste-related data for your jurisdiction. (p. 18)
Additional information	
Planned data source	Valdemingómez Technology Park activity reports. Calculations available in "Auxiliary_calculations".
Planned availability	Annual
Planned collection interval	2015-2030
References	
Results describing the indicator	5.2.1 Evolución de la tasa de recuperación en sectores residencial, servicios y municipal Variables / Unidades / 2015 / 2016 / 2017 / 2018 / 2019 / 2020 / 2021 Tasa de recuperación anual: % / 7,10 / 7,03 / 7,17 / 7,96 / 8,35 / 7,62 / 8,65 Indicador: % / 7,10 / 7,03 / 7,17 / 7,96 / 8,35 / 7,62 / 8,65 Evolución indicador: (2015=100) / 100 / 99 / 101 / 112 / 118 / 107 / 122
Other indicator systems using this indicator	-

B-3.2: Indicator metadata

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Sector: Waste and reforestation *Action / project / sub-sector: Increase recovery rates in the RCI sector*	
Indicator name	Development of the total mass of bio-waste collected separately
Indicator unit	5.3.1
Definition	The indicator has been defined as the total mass of bio-waste collected selectively as a measure of progress in the separation/collection of organic waste, as well as the degree of commitment of the municipality and its inhabitants to this selective collection. Since the selective collection of bio-waste was launched in 2017, data is only available from that year. Informative indicator to be assessed together with the rest of the sector indicators. Its trend is expected to increase.
Method of calculation	It is taken from the row Bio-waste fraction in table 7.2. For the relative evolution, the first non-zero data in the series, which occurs in 2017, is considered. Measured in tonnes (t).
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	No
If yes, to which area of emission is the co-benefit linked?	N/A
Does the indicator measure indirect impacts (i.e. co-benefits)?	Yes

MATERIA ORGÁNICA TRATADA EN BIOMETANIZACIÓN	AÑO				
	2017	2018	2019	2020	2021
Biometanización La Paloma (MOR)					
Materia orgánica procedente de Las Lomas	414,00	0,00	6.228,16	20.417,04	**12.561,80**
Materia orgánica procedente de La Paloma	102.637,00	104.929,67	94.748,54	78.557,43	**81.238,53**
Materia orgánica a pretratamiento	103.051,00	104.929,67	100.976,70	98.974,47	**93.800,33**
Materia orgánica a digestión	64.394,00	68.193,62	63.255,87	64.390,00	**60.871,78**
Biometanización Las Dehesas (FORS)					
Fracción biorresiduos	2.089,04	37.544,53	127.777,20	194.634,17	**215.485,42**
Materia orgánica a pretratamiento	159.786,00	179.704,27	167.878,88	194.634,17	**215.485,42**
Fracción orgánica a digestión	112.146,00	131.600,33	109.234,38	136.999,52	**143.402,64**
TOTAL A PRETRATAMIENTO	**264.715,67**	**280.680,97**	**266.853,35**	**293.608,64**	**309.285,75**
TOTAL MATERIA ORGÁNICA A DIGESTIÓN	**180.339,62**	**194.856,20**	**173.624,38**	**201.389,52**	**204.274,42**

Tabla 7.2.
Evolución de la materia orgánica tratada en las plantas de biometanización (2017-2021, toneladas)

If yes, what co-benefit do you measure?	Improving the energy use of waste (generation of biogas and electricity). Use of organic material for the generation of agricultural fertilisers.
Can the indicator be used to monitor impact pathways?	Yes
If yes, for which impact pathway?	Increasing recovery rates in the RCI sector
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes, partially. (3.7) Report the following waste-related data for your jurisdiction. (p. 18)
Additional information	
Planned data source	Activity reports of the Valdemingómez Technology Park. Year 2021
Planned availability	Annual
Planned collection interval	2015-2030
References	
Results describing the indicator	5.3.1 Evolución de la masa total de biorresiduos recogidos selectivamente *Consultar apartado de Observaciones
Other indicator systems using this indicator	-

Variables	Unidades	2015	2016	2017	2018	2019	2020	2021
Masa total de biorresiduos recogidos selectivamente al año	t/año	0	0	2.089	37.545	127.777	194.634	215.485
Indicador	**t/año**	**0**	**0**	**2.089**	**37.545**	**127.777**	**194.634**	**215.485**
Evolución indicador	(2017=100)*	-	-	100	1.797	6.117	9.317	10.315

B-3.2: Indicator metadata	
Sector: Waste and reforestation ***Action / project / sub-sector: Naturalise and reforest the municipality***	
Indicator name	Evolution of CO2 removals (sinks)

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Indicator unit	1.6.1
Definition	Absorptions by CO2 sinks are a natural mechanism for minimising the total concentration of carbon dioxide in the atmosphere and thus minimise global warming. Expected trend: unchanged or slightly increasing.
Method of calculation	Obtained from the Absorptions column in table 56 of the Inventory of greenhouse gas emissions in the municipality of Madrid. Year 2020. Measured in kilotonnes of CO2 equivalent (kt CO2 eq). **Tabla 56. Emisiones de GEI del grupo SNAP 11 (kt CO_2 equivalente)**
Context	
Does the indicator measure direct impacts (i.e. reduction of greenhouse gas emissions)?	Yes
If yes, to which area of emission is the co-benefit linked?	(2.1d) Provide a breakdown of your community-wide emissions in the format of the Common Reporting Framework. (p. 15) AFOLU > Land use (p. 16)
Does the indicator measure indirect impacts (i.e. co-benefits)?	No
If yes, what co-benefit do you measure?	N/A
Can the indicator be used to monitor impact pathways?	Yes

Año	Emisiones				Absorciones	Balance neto
	CH_4	CO_2	N_2O	TOTAL	CO_2	
1999	9,1	0	0,0007	9,1	-40,5	-31,4
2000	9,1	0	0,0021	9,1	-40,8	-31,7
2001	9,3	0	0,0018	9,3	-40,9	-31,6
2002	9,5	0	0,0017	9,5	-41,1	-31,6
2003	9,7	0	0,0017	9,7	-41,4	-31,7
2004	9,7	0	0,0016	9,7	-41,7	-32,0
2005	9,9	0	0,0008	9,9	-42,1	-32,2
2006	9,8	0	0,0011	9,8	-42,2	-32,4
2007	9,8	0	0,0005	9,8	-42,8	-32,9
2008	10,0	0	0,0004	10,0	-42,8	-32,8
2009	10,2	0	0,0003	10,2	-43,2	-33,0
2010	10,2	0	0,0001	10,2	-43,3	-33,1
2011	10,2	0	0,0004	10,2	-44,2	-34,0
2012	10,1	0	0,0016	10,1	-44,3	-34,2
2013	10,0	0	0,0012	10,0	-44,3	-34,3
2014	9,9	0	0,0004	9,9	-43,5	-33,5
2015	9,8	0	0,0006	9,8	-43,3	-33,5
2016	9,9	0	0,0004	9,9	-43,8	-33,9
2017	10,0	0	0,0003	10,0	-43,8	-33,9
2018	10,1	0	0,0001	10,1	-39,6	-29,5
2019	10,2	0	0,0018	10,2	-39,6	-29,4
2020	10,4	0	0,0013	10,4	-40,5	-30,1

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If yes, for which impact pathway?	Naturalise and reforest the municipality
Is the indicator captured by existing CDP/SCIS/Mayors' Covenant platforms?	Yes (2.1d) Provide a breakdown of your community-wide emissions in the format of the Common Reporting Framework. (p. 15) AFOLU > Land use (p. 16)
Additional information	
Planned data source	Inventory of greenhouse gas emissions in the municipality of Madrid. Year **2020**
Planned availability	Annual
Planned collection interval	2015-2030
References	
Results describing the indicator	1.6.1 Evolución de las absorciones de CO2 (sumideros)
Other indicator systems using this indicator	-

Variables	Unidades	2015	2016	2017	2018	2019	2020
Absorción de CO_2	kt CO_2	43,3	43,8	43,8	39,6	39,6	40,5
Indicador	**kt CO_2**	**43,3**	**43,8**	**43,8**	**39,6**	**39,6**	**40,5**
Evolución indicador	(2015=100)	100	101	101	91	91	94

PART C - ENABLING CLIMATE NEUTRALITY BY 2030

This module aims to outline any enabling interventions - i.e. in relation to organisational environment or governance models, or social innovations - designed to support and implement the climate action portfolios described in module B-2, as well as to achieve the co-benefits described in the impact pathway (module B-1).

MODULE C-1

Organisational and governance innovation interventions

It consists of a summary table, indicating the organisational and governance actions and describing their impacts (C-1.1), and a section for more detailed descriptions and comments (C-1.2).

C.1.1: Organisational and Governance Interventions					
Name of the performance	**Description**	**Person and entity/body responsible**	**Actors involved**	**Impact**	**Cobenefits**
"Interdepartmental Clima Group	Network of municipal officials from six different government areas with the aim of mainstreaming the climate dimension in municipal actions.	Madrid City Council Internationalisation and Cooperation Delegate Area	25 people from the following government departments of the City Council: Culture, Tourism and Sport; Urban Development; Economy, Innovation and Employment; Internationalisation and Cooperation; Finance and Personnel; and Environment and Mobility.	Internal coordination and mainstreaming of the climate dimension in municipal actions	Systemic approach; human scale actions; interrelationships of climate actions on health and social well-being; generation of fair employment.

Collaborative Platform for Climate Neutrality in Spanish Cities		Ministry for Ecological Transition and the Demographic Challenge of the Spanish Government, with the management support of EIT Climate-KIC (in collaboration with the Polytechnic University of Madrid - UPM).	The City Councils of Barcelona, Seville, Valencia, Valladolid, Vitoria-Gasteiz and Zaragoza, the Ministry for Ecological Transition and the Demographic Challenge, EIT Climate-KIC, UPM, Fundación Biodiversidad, the Spanish Office for Climate Change, and the European project NetCeroCities for the operationalisation of the European Cities Mission.	The aim is to accelerate the implementation of solutions with social, economic and environmental impact, bringing together public and private efforts for urban transformation.	Design and implementation of simultaneous actions in several Spanish cities (multi-city projects) that amplify the scale of the initiatives. Opportunities for inter-city training, learning and capacity building, and joint efforts to facilitate citizen participation and activation processes not only on a local but also on a national scale.
Participation in national and European networks of cities linked to climate challenges (C40, EIT Climate-KIC, Covenant of Mayors, EuroCities, FEMP-Cities for	Madrid continues to be present and to expand its participation in national and European networks of cities linked to climate challenges.	City Hall	All Government Areas	International presence and visibility, meeting common milestones together with other cities in each network, common commitments.	Knowledge of the peer network, exchange of experiences, monitoring of global climate policy.

Climate Network).					
Chamartín Business Centre Climate Action Demonstrator Area (initial approval by the Governing Board 16-03-23)	*Action Plan to accelerate climate neutrality in the urban area of the Madrid Nuevo Norte Business Centre.*	*Madrid City Council. Directorate of Sustainability and Environmental Control*	*Management Committee of the Chamartín Business Centre and Crea Madrid Nuevo Norte, S.A.*	*It establishes measures for the Chamartín Business Centre to have emissions of 0.4 tCO2e/pers-eq. The measures will be updated every 3 years.*	*Decarbonisation Living Lab to test regulations and public-private partnerships in a controlled environment.*

C-1.2: Description of organisational and governance interventions

Climate change is a cross-cutting priority of multi-level coherence in public policies (Madrid Urban Agenda, Recovery, Transformation and Resilience Plan, SDG Localisation Strategy). Climate and Air Quality policies are merged and coordinated from the Environment and Mobility Area, where there is a specific unit (SG Energy and Climate Change) with a dedicated technical staff of 10 people. For the development of the Roadmap towards Climate Neutrality, an interdepartmental "Clima Group" was created in 2019 with senior officials from 6 Government Areas of the City Council: Culture, Tourism and Sport; Urban Development; Economy, Innovation and Employment; Internationalisation and Cooperation; Finance and Personnel; and Environment and Mobility. This group seeks coordinated action from within the City Council to include the climate dimension in all projects promoted or in which it participates.

Being a Mission City implies a change in climate policy governance to mobilise such a large-scale transformation. The city of Madrid has always made clear its conviction that it is essential to learn from each other if we are to go far and go fast as circumstances demand. Building on existing alliances, agreements and public-private collaboration spaces that link businesses, public institutions and society (e.g. Madrid Futuro, energy companies, Foro de Empresas por Madrid...), the creation of a **Local Climate Action Platform** with businesses, social agents and other relevant urban actors is proposed in order to bring together commitments and synergic projects in the city in a rigorous and verifiable way. On the other hand, the global and complex dimension of the climate crisis requires that this networking should not be limited to the local sphere, and it is essential to **connect with other cities to** share knowledge and experience. In this sense, Madrid is part of the "Plataforma de Colaboración para la Neutralidad Climática de las Ciudades Españolas" **(citiES 2030)** promoted by the Ministry for Ecological Transition and the Demographic Challenge and has extensive experience in international initiatives such as the **C40** Cities Leadership Group, the **Covenant of Mayors** for Climate and Energy or the **EUROCITIES** network, as well as in participating in European research, technological development, demonstration and innovation projects.

The Chamartín Business Centre's **Climate Action Demonstration Area** within the scope of Madrid Nuevo Norte addresses measures to facilitate zero emission buildings through the promotion of district heating and cooling networks and renewable energy communities, sustainable mobility measures to change mobility

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patterns, sustainable urban drainage systems and water regeneration projects to minimise the use of drinking water.

MODULE C- 2

Social and Other Innovation Interventions

It consists of a summary table listing social and other innovation actions and describing their impact (C-2.1) and a section for more detailed descriptions and comments (C-2.2).

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C.1.1: Social innovation and other interventions					
Name of the performance	**Description**	**Person and entity/body responsible**	**Actors involved**	**Impact**	**Co-benefits**
Mutant Institute for Environmental Narratives	Alliance between the Madrid City Council (Environment and Mobility Area), the public centre for contemporary creation Matadero-Madrid and the Polytechnic University of Madrid to create an artistic laboratory for the climate in 2018.	Matadero-Madrid	Madrid City Council (Environment and Mobility Area), Matadero-Madrid and the Polytechnic University of Madrid.	Broadening of audiences reached by climate communication through the connection of the scientific community with expertise in climate knowledge and the artistic community of recognised prestige. Use of new narratives to disseminate climate change.	New audiences can learn about and become aware of the climate crisis. Expansion of social spaces where the issue is present.
Madrid City Studio	Scientific collaboration programme for the development of Master's and Bachelor's Degree Final Projects and on city problems included in the Roadmap to Climate Neutrality for the city of	Universidad Politécnica de Madrid and Madrid City Council	Students, teachers, civil servants and programme managers (in the first edition: 40 people directly involved, and 85 indirectly).	Involvement of students together with City Council officials in different strategic projects that address identified problems in the city related to climate neutrality objectives.	Co-design of a set of solutions; disruptive ideas through collaborative work and empathy between generations; feeling of contributing to the needs of the city by young people.

	Madrid by 2050.				
European innovation projects with citizen participation: CLEVER, LIFE-PACT, Food Wave, ECCENTRIC.	Innovation projects funded through European calls to design and implement climate actions for electric and non-motorised mobility, revegetation of infrastructures and public space and the design of indicators that specifically measure climate impact.	Madrid City Council	Allied partners in each project (other public administrations with competences in each field, companies, educational communities).	Implementation and experimentation in climate action demonstration zones in the city. Collaboration between public and private actors with a common purpose.	Satisfaction of the populations living in the areas of action (more naturalised neighbourhoods in the future, with more sustainable and electric modes of mobility, sustainable food practices integrated into food chains).
EIT Climate-KIC Innovation Projects with citizen participation: Madrid Deep Demostration, Climate, Ecología a Pie de Barrio, Innovation Leadership Program, Climate Accelerator Program, Journey, Climathon (from 2019 to 2022)	EIT Climate-KIC funded innovation projects for the creation of connected climate action portfolios that foster entrepreneurship and collaborative design skills.	EIT Climate-KIC, Polytechnic University of Madrid and Madrid City Council	Allied partners in each project and groups impacted by the action (companies, cultural centres, start-ups, for example).	Implementation and experimentation in climate action demonstration zones in the city. Collaboration between public and private actors with a common purpose.	Experimentation that can provide lessons for other experiments in other areas of the city and for other cities.
Municipal School Environments	Action in 218 schools (primary and secondary)	Madrid City Council (various government	School communities of the schools (in	Increased road safety on access roads to	Satisfaction of the populations

Programme (inter-area)	in the 21 districts of the city to adapt them to climate change until 2023.	departments involved)	the pilot actions), companies carrying out the work	schools and for the health of children, parents and/or family members and teachers. Infrastructure better adapted to the adverse effects of climate change (when the action is completed).	living in the areas of action. Experimentation that can provide lessons for other experiments in other areas of the city and for other cities.
Madrid Zero Emissions" open events	Annual event to disseminate innovative climate actions.	Madrid City Council	La Casa Encendida (MonteMadrid Banking Foundation), Democratic Society, Universidad Politécnica de Madrid, C40, Laudes Foundaiton and EIT Climate-KIC and more than 50 speakers.	Dissemination of climate action from practice. Real cases that demonstrate how to move towards more sustainable city models from different approaches.	New audiences can learn about and become aware of the climate crisis. Expansion of social spaces where the issue is present.

C-1.2: Description of social and other innovation actions

Madrid City Studio is the scientific collaboration programme promoted by the Universidad Politécnica de Madrid (UPM) and the Madrid City Council for the development of Master's and Bachelor's Degree Final Projects on real problems of the Roadmap to Climate Neutrality for the city of Madrid by 2050. The projects have been developed with the support of scholarships offered by the UPM, and each student had two tutors, one academic and one official from the City Council, expert in the need or challenge identified by the city.

For the proposal of topics, first the needs of the city were identified and then the connection was made with research groups and students of the UfM. The main objective was to support those departments that needed scientific development on a specific topic, and to strengthen municipal teams that needed to include scientific analysis in their projects and strategies.

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The added value of this project lies in the ability to scale solutions connected to actions already underway in the city and to extend the scientific rigour of the analysis and decision-making. The working methodology of City Studio is prepared to allow the participation of other actors, the keys are in designing the programme and managing interdisciplinary relationships and knowledge. Among the topics addressed in the Programme developed from May 2021 to January 2022 between UPM and Madrid City Council are: regeneration, energy, mobility, circular economy, resilience, adaptation to climate change (support to the Metropolitan Forest and design of new green infrastructures from an artistic perspective - "cyborg" garden).

MODULE C-3

Financing of Action Portfolio (Economic Case)

It should contain the list of actions and actions indicated in modules B-2, C-1 and C-2 and detail further cost-related information to provide the basis for the Climate Investment Plan.

The assumptions set out in the **Economic Model** and the related costs to carry them out are detailed below.

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Subsector	Assumptions 2030		Start and end date	Scope of action	Impact			Estimated total cost
					GHG reduction (kt CO2e)	Operational cost savings (MEUR - NPV 2020-2050)	co-benefits (MEUR - NPV 2020-2050)	
Reduction in the need for motorised transport	15%	reduction	2020-2030	Transport	215	3.822 €	€ 1.010	
Modal shift to public and non-motorised transport	*5%*	*reduction in private vehicle passenger-km*	*2020-2030*	*Transport*	*39*	*€ 129*	*€ 328*	*-169 €*
Increase shared transport and car pooling	*11%*	*due to increased transport efficiency*	*2020-2030*	*Transport*	*99*	*€ 1.470*	*€ 527*	*€ -*
Car electrification	*32%*	*of the electrified fleet by 2040*	*2020-2040*	*Transport*	*182*	*€ (120)*	*€ 73*	*-261€*
Bus electrification	*49%*	*of the electrified fleet*	*2020-2030*	*Transport*	*62*	*€ 137*	*€ 95*	*- 60 €*
Optimisation of logistics	*10%*	*reduction of travel distance through route optimisation*	*2020-2030*	*Transport*	*133*	*€ 663*	*€ 197*	*€ -*
Electrification of goods	*90%*	*Trucks <3.5 t to 2040*	*2020-2030*	*Transport*	*59*	*€ 22*	*€ 35*	*-325 €*
	40%	*Trucks >3.5 t to 2040*	*2020-2031*	*Transport*				
Building energy efficiency renovations	*2,0%*	*of all existing buildings / year*	*2020-2030*	*Buildings and Heating and Cooling*	*60*	*€ 640*	*€ 48*	*- 1.892 €*

New buildings highly energy efficient	*20%*	*percentage of new buildings constructed according to the highest energy efficiency standards*	*2020-2030*	*Buildings and Heating and Cooling*	*23*	*€ 263*	*€ 20*	*-409 €*
Efficient lighting & appliances	*100 %*	*of luminaires retrofitted between 2020 and 2030 (40% efficiency improvements)*	*2020-2030*	*Buildings and Heating and Cooling*	*247*	*€ 2.879*	*€ 21*	*-1.431 €*
Decarbonizing heating	*44%*	*Percentage of electric local heating*	*2020-2030*	*Buildings and Heating and Cooling*	*1002*	*€ 993*	*€ 434*	*- 1.909 €*
Shift to renewable electricity	*85%*	*Part of the current electricity production from fossil fuels replaced by renewable energies*	*2020-2030*	*Electric*	*2640*	*€ 2.415*	*€ -*	*- 1.393 €*
Increase recovery rates in the Residential, Services and Institutional sectors.			*2020-2030*	*Waste*	*90*	*€ 14*	*€ 2*	*-6 €*
Total					***4850***	***€ 13.329***	***€ 2.790***	***-7.855 €***

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For the **extended case** (ambition of 75% GHG reduction in 20230 compared to 1990) the scenarios to be developed are shown below:

Hypothesis: Extended case

Subsector	Assumptions 2030		Start and end date	Scope of action	Impact			Estimated total cost
					GHG reduction (kt CO2e)	Operational cost savings (MEUR - NPV 2020-2050)	co-benefits (MEUR - NPV 2020-2050)	
Reduction in the need for motorised transport	30%	reduction	2020-2030	Transport	430	7.398 €	€ 1.957	
Modal shift to public and non-motorised transport	*25%*	*reduction in private vehicle passenger-km*	*2020-2030*	*Transport*	*146*	*€ 552*	*€ 1.392*	*-718 €*
Increase shared transport and car pooling	*11%*	*due to increased transport efficiency*	*2020-2030*	*Transport*	*67*	*€ 1.073*	*€ 382*	*€ -*
Car electrification	*32%*	*of the electrified fleet by 2040*	*2020-2040*	*Transport*	*122*	*-74 €*	*€ 51*	*-213€*
Bus electrification	*49%*	*of the electrified fleet*	*2020-2030*	*Transport*	*65*	*€ 144*	*€ 100*	*- 61 €*
Optimisation of logistics	*10%*	*reduction of travel distance through route optimisation*	*2020-2030*	*Transport*	*133*	*€ 663*	*€ 197*	*€ -*
Electrification of goods	*90%*	*Trucks <3.5 t to 2040*	*2020-2030*	*Transport*	*59*	*€ 22*	*€ 35*	*-325 €*
	40%	*Trucks >3.5 t to 2040*	*2020-2031*	*Transport*				
Building energy efficiency renovations	*3,5%*	*of all existing buildings / year*	*2020-2030*	*Buildings and Heating and Cooling*	*202*	*€ 2.147*	*€ 159*	*- 5.826 €*

New buildings highly energy efficient	*20%*	*percentage of new buildings constructed according to the highest energy efficiency standards*	*2020-2030*	*Buildings and Heating and Cooling*	*23*	*€ 263*	*€ 20*	*-409 €*
Efficient lighting & appliances	*100 %*	*of luminaires retrofitted between 2020 and 2030 (40% efficiency improvements)*	*2020-2030*	*Buildings and Heating and Cooling*	*345*	*€ 4.255*	*€ 31*	*-1.951 €*
Decarbonizing heating	*55 %*	*Percentage of electric local heating*	*2020-2030*	*Buildings and Heating and Cooling*	*1145*	*€ 1.083*	*€ 506*	*- 1.951 €*
Shift to renewable electricity	*85%*	*Part of the current electricity production from fossil fuels replaced by renewable energies*	*2020-2030*	*Electric*	*2.579*	*€ 2.305*	*€ -*	*- 1.357 €*
Increase recovery rates in the residential, services and institutional sectors.			*2020-2030*	*Waste*	*90*	*€ 14*	*€ 2*	*-6 €*
Total					***5.404***	***€ 19.847***	***€ 4.833***	***-12.846 €***

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Outlook and next steps

This section should include the necessary conclusions on the Action Plan and highlight the next steps and plans to further develop the Action Plan as part of the City's Climate City Contract.

The Climate Accords, as part of an iterative process of continuous improvement, will be reviewed within the next 2 years. The following are the next steps and plans in the process of reviewing and improving the Action Plan as part of the city's Climate Accord.

1. **Improving and extending the Economic Model**: This refers to the review and adjustment of the current economic model with the aim of broadening its scope and refining its analysis so that it reflects even more accurately the ambition of the climate action plan and the associated capital and investment needs. The 'extended case' study will also be developed.

2. Specification of the **initiatives and projects included** in the Action Plan: This involves identifying and defining in detail the different actions, initiatives and projects that form part of the Action Plan, with the aim of ensuring their financing and adequate implementation.

3. Broaden **interdepartmental collaboration** to advance the implementation of the Climate Investment Plan: This refers to the need to promote greater collaboration between the different departments and work areas involved in the implementation of the Climate Investment Plan, in order to improve their coordination and increase their effectiveness.
   Promotion of the interdepartmental Clima Group.

4. Obtain **specific commitments** from various entities within the framework of the Climate City Contract (Letters of Accession): The aim is to obtain the formal commitment of various entities and organisations within the framework of the Climate City Contract, through the signing of Letters of Accession, to support and collaborate in the achievement of the objectives and goals established therein.

5. Development of **monitoring and evaluation plan** Climate City Contracts: Key JI indicators, data collection method and monitoring reporting requirements: This refers to the development of a detailed plan for monitoring and evaluation of the Climate City Contract, identifying the key indicators to be measured, the data collection method and the monitoring reporting requirements.

6. Implementation of the **monitoring and evaluation process**, including communication of the plan to participating cities and guidance on data collection and reporting: This is the implementation of the monitoring and evaluation plan, including communication of the plan to participating actors and entities and guidance on how to collect data and prepare the related monitoring reports.

7. Collection of **baseline data** on the key indicators identified in the M&E plan: Refers to the collection of baseline data on the key indicators identified in the M&E plan, in order to establish a basis for comparison for future measurement and analysis.

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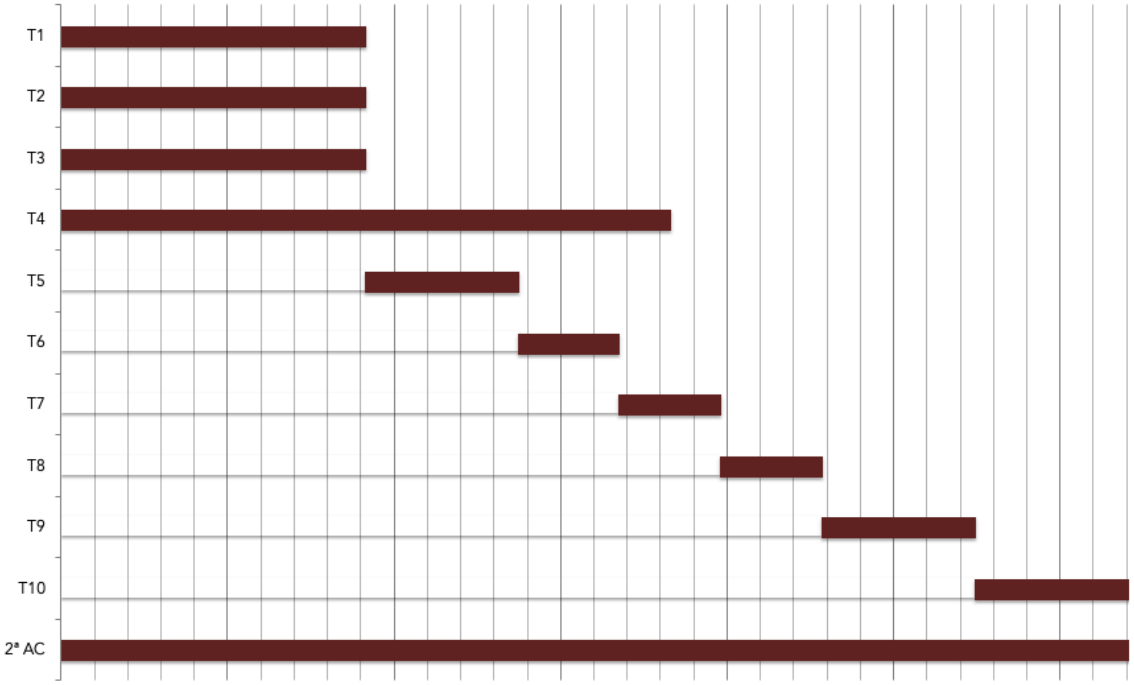
8. **Analysis of reference indicators** and degree of progress in achieving emission reduction targets: The aim is to analyse the benchmark indicators and assess the degree of progress in achieving the emission reduction targets set out in the Climate City Contract.

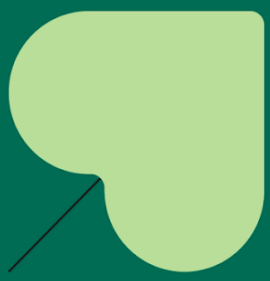
9. **Review of the** Cities **Climate City Contract based** on the results of the evaluation process, including assessment of the effectiveness of the monitoring and evaluation process and identification of areas for improvement: Refers to the review of the Cities Climate City Contract based on the results of the evaluation process.

The deadlines shown below are indicative and may be modified and adapted during the course of the year, with a maximum deadline of 2 years for a 2nd version of the Climate City Contract.

T	Tasks	Start date	Final date
T1	Improvement and extension of the Economic Model	M1	M6
T2	Specification of the initiatives and projects included in the Action Plan	M1	M6
T3	Expand interdepartmental collaboration to advance the implementation of the Climate Investment Plan.	M1	M6
T4	Obtain specific commitments from various entities under the Climate City Contract (Letters of Accession).	M1	M12
T5	Development of monitoring and evaluation plan to Climate City Contracts: Key indicators, data collection method and monitoring reporting requirements	M6	M9
T6	Implementation of the monitoring and evaluation process, including communication of the plan to participating cities and guidance on data collection and reporting.	M9	M11
T7	Gathering baseline data on key indicators identified in the monitoring and evaluation plan	M11	M13
T8	Analysis of baseline indicators and progress towards achieving emission reduction targets	M11	M13
T9	Review of the Cities Climate City Contract based on the results of the evaluation process, including assessing the effectiveness of the monitoring and evaluation process and identifying areas for improvement.	M13	M16

T10	Drafting of the 2nd version of the Climate City Contract based on the results of the assessment and monitoring process	M16	M24
2ND CA	**2nd version Climate City Contract**	**M1**	**M24**





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Acuerdo climático de la ciudad de *Madrid*

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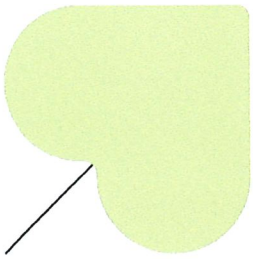

Madrid

Índice

Introducción

En el momento crucial de la respuesta mundial a las emergencias relacionadas con el clima, la Unión Europea se ha comprometido a liderar la acción climática y ha establecido los objetivos y la legislación para poder lograrlo. Así, la Unión Europea debe reducir sus emisiones en, al menos, un 55% para el año 2030 y alcanzar la neutralidad climática a mediados de siglo. En este contexto, las ciudades están llamadas a desempeñar un papel fundamental, tanto para acelerar el proceso de descarbonización como para asegurar una transformación justa y equitativa, que contribuya al bienestar del conjunto de la sociedad.

No en vano, las ciudades, pese a ocupar solamente en torno al 3% de la superficie terrestre, generan más del 70% de las emisiones de gases de efecto invernadero y consumen más del 65% de la energía en el ámbito global. Y es importante que actúen como centros de experimentación e innovación en la transición hacia la neutralidad climática.

La Misión de la Unión Europea "100 ciudades climáticamente neutras e inteligentes antes de 2030" pretende apoyar la transformación de las ciudades para acelerar el cumplimiento del Acuerdo de París, y constituirse tanto en un elemento catalizador e impulsor de la implementación del Pacto Verde Europeo, como en un demostrador de que es posible alcanzar la neutralidad climática antes de 2050.

En España, el 8 de septiembre de 2021 el Gobierno de España y los Ayuntamientos de Barcelona, Madrid, Sevilla y Valencia firmaron la Declaración "Ciudades climáticamente neutrales en 2030" (anexa a este Acuerdo), como un impulso a los compromisos e iniciativas de las ciudades firmantes y un apoyo del Gobierno a la transformación de estas ciudades para lograr la neutralidad climática y mejorar su resiliencia. Siguiendo la senda abierta, el 13 de diciembre se adhirieron a la Declaración los Ayuntamientos de Soria, Valladolid, Vitoria-Gasteiz y Zaragoza.

Además, el 15 de septiembre de 2021 el Pleno del Senado aprobó una moción por la que se insta al Gobierno a impulsar la neutralidad climática de las ciudades en el marco de la Misión Europea de Ciudades. La moción reconoce el papel fundamental de las ciudades en la respuesta a la emergencia climática y destaca la oportunidad de acelerar los cambios necesarios y transversales para que las ciudades sean

climáticamente neutras en 2030. También valora que las distintas Administraciones territoriales impulsen y faciliten la neutralidad climática de las ciudades españolas a través de su incorporación a la Misión de Ciudades y mediante el desarrollo de proyectos de transformación.

En este sentido, el 25 de noviembre de 2021 la Misión de Ciudades lanzó una convocatoria de expresión de interés dirigida a las ciudades europeas de más de 50.000 habitantes interesadas en participar. De las 377 que se presentaron, se seleccionaron 100 de la UE-27, entre las que figuran las ciudades españolas de Barcelona, Madrid, Sevilla, Valencia, Valladolid, Vitoria-Gasteiz y Zaragoza.

El Plan de implementación de la Misión prevé que cada una de las 100 ciudades seleccionadas elabore un Acuerdo de Neutralidad Climática de la Ciudad adaptado a su propia realidad, mediante un proceso de creación conjunta y en estrecha colaboración con el conjunto de la sociedad civil y con la ciudadanía, que detalle la estrategia de despliegue y seguimiento de soluciones innovadoras y digitales para alcanzar la neutralidad climática; y que permita a otras ciudades seguir su ejemplo antes de 2050. Así, este documento constituye un compromiso político claro, no solo ante la Comisión Europea y las autoridades nacionales, regionales y locales, sino también ante la ciudadanía e incluye un plan general de acción climática en los distintos sectores, como la energía, los edificios, la gestión de residuos y el transporte, junto con los correspondientes planes de inversión.

De esta manera, el presente documento responde a las exigencias de la Misión Europea de Ciudades. Ha sido elaborado por la ciudad, con la participación de otros actores públicos y privados, y establece planes para lograr la neutralidad climática. En particular, reconoce que la Misión no puede tener éxito sin estar sólidamente anclada en la comunidad local y concitar un amplio apoyo. Por ello, involucra a la sociedad civil, grupos de jóvenes, instituciones culturales y sectores creativos, fundaciones, medios de comunicación locales, pequeñas y medianas empresas, industria privada, sindicatos, academia e investigación, y sector público, entre otros, en sus correspondientes funciones como decisores, usuarios, consumidores, productores y propietarios.

Además, integra las cualidades y el patrimonio propio de la ciudad, que garantizan la dimensión local de la transición hacia la neutralidad climática, pero, también, su carácter inclusivo, conforme a los valores de la Nueva Bauhaus Europea (arte/cultura,

sostenibilidad, sociedad). Fomenta el sentido de pertenencia y apropiación por parte de los habitantes de la ciudad y de los actores profesionales, poniendo de manifiesto que su contribución singular es relevante y que el cumplimiento de este Acuerdo redundará en una mejor calidad de vida y un mejor medio ambiente para todos.
Por otra parte, se configura en el marco de un proceso iterativo, como un documento que estará sujeto a seguimiento y actualización, tanto a través de la firma de adendas como de otros documentos de adhesión, aglutinando así a otros actores necesarios para que la ciudad alcance el objetivo de neutralidad climática establecido. En particular, los compromisos que se recogen podrán ser ampliados o actualizados para que contribuyan efectivamente a la consecución de la neutralidad climática en la ciudad.

El documento se divide en varias partes: una relativa al compromiso de las ciudades para alcanzar la neutralidad climática de la ciudad; otra relativa al apoyo y coordinación institucional de las distintas administraciones públicas; otra parte referente a su seguimiento y actualización; y una última que comprende los anexos correspondientes al Plan de Acción Climática, al Plan de Inversión Climática de la Ciudad y al de Actores de la Ciudad y compromisos asumidos, que siguen los modelos elaborados por NetZeroCities[1].

[1] El proyecto NetZeroCities forma parte del Programa de Investigación e Innovación Horizonte 2020 y proporciona la asistencia técnica, reglamentaria y financiera necesaria a las ciudades de la Misión Europea de Ciudades (https://netzerocities.eu/the-nzc-project/).

Compromiso de la ciudad de Madrid hacia la neutralidad climática

Introducción

Madrid ha mostrado su compromiso e implicación en iniciativas internacionales de colaboración y liderazgo de las ciudades frente al Cambio Climático desde las primeras reuniones que dieron origen a la creación de la red C40, en octubre de 2005 en Londres, desarrollando desde entonces y de forma continuada la actividad en materia de prevención y lucha contra el cambio climático. Cabe mencionar algunos hitos como la aprobación por el Pleno Municipal de la adhesión al "Pacto de los Alcaldes" (Covenant of Mayors[2]), en noviembre de 2008, obligándose a superar el objetivo fijado por la Unión Europea (UE) de reducir en un 20% las emisiones de GEI antes de 2020. Posteriormente, en julio de 2014 el Pleno acordó aprobar la adhesión del Ayuntamiento de Madrid a la iniciativa "Alcaldes por la Adaptación" (Mayors Adapt[3]). En septiembre de 2014 se presentó en la Cumbre sobre el Clima organizada por Naciones Unidas la iniciativa Compact of Mayors[4], a la que se adhirió la ciudad de Madrid, con el objetivo de que las ciudades se comprometan a reducir sus emisiones de GEI, haciendo públicos sus planes y objetivos de mitigación y adaptación al cambio climático, así como su seguimiento anual, utilizando una metodología común de inventario de emisiones a escala urbana. Posteriormente, en 2018 el Ayuntamiento de Madrid se adhiere al compromiso 'Deadline 2020[5]' impulsado por la red de Liderazgo de ciudades frente al Cambio Climático - C40, por el que se compromete a elaborar un plan de acción.

En esta última legislatura se ha intensificado la acción climática para dar respuesta a la urgente necesidad de enfrentar este desafío global y alinear las estrategias municipales al contexto de políticas europeas en esta materia. Entre los diferentes compromisos asumidos por el Ayuntamiento de Madrid destacamos la adopción, por

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[2] https://eu-mayors.ec.europa.eu/en/home

[3] https://climate-adapt.eea.europa.eu/en/metadata/portals/mayors-adapt-the-covenant-of-mayors-initiative-on-adaptation-to-climate-change

[4] https://www.uclg.org/es/node/23789

[5] https://www.c40.org/wp-content/uploads/2021/07/Deadline_2020.pdf

el Pleno en septiembre de 2019, de la Declaración de Emergencia Climática y la activa implicación de nuestra ciudad como sede de la COP25. También en 2019 la ciudad de Madrid presenta la Estrategia de Sostenibilidad Ambiental Madrid 360[6], elaborada con el objetivo de luchar contra el cambio climático y cumplir con los límites de calidad del aire establecidos por la legislación de la Unión Europea y las recomendaciones de la Organización Mundial de Salud, objetivo alcanzado en el año 2022. La Estrategia tiene un carácter amplio, ya que abarca todas las fuentes de emisión y todos los distritos de la ciudad, mejorando la calidad del aire a través de tres pilares de transformación: la ciudad, la movilidad y el gobierno. En 2020 se produce la aprobación en el Pleno municipal de la adhesión a la comunidad Climate-KIC del Instituto Europeo de Innovación y Tecnología, que incorpora la visión sistémica y la necesidad de establecer una colaboración multi-actor en Madrid como ciudad demostradora del programa Deep Demo "Healthy, clean cities", principios que se reflejarán posteriormente en el concepto de la Misión de ciudades. En los Acuerdos de la Villa, aprobados por unanimidad de todos los partidos políticos de la corporación municipal y cuyo objeto es reactivar Madrid tras los efectos de la pandemia, se incluye la necesidad de elaborar una hoja de ruta de acción climática. Como resultado de este acuerdo unánime y en el marco de la Estrategia Madrid 360, se elaboró la 'Hoja de ruta hacia la neutralidad climática para 2050[7], que oficialmente fue presentada por el Alcalde en marzo de 2021.

La Hoja de Ruta hacia la neutralidad climática es un análisis técnico para apoyar el compromiso político de acción contra el Cambio Climático. La Hoja de Ruta alinea las políticas municipales con las nacionales y europeas, y eleva la ambición requerida para las ciudades que quieren estar a la vanguardia de este movimiento global. La Hoja de Ruta establece como objetivo reducir los Gases de Efecto Invernadero (GEI) en un 65% para 2030 (en comparación con los niveles de 1990), y alcanzar la neutralidad climática en 2050, así como aumentar la resiliencia de la ciudad frente a los riesgos climáticos. Este complejo desafío no puede ser abordado actuando exclusivamente sobre las fuentes de emisión. Requiere una transformación social y un cambio de paradigma en la forma en que construimos, gobernamos y habitamos una ciudad. Incorporar la colaboración entre administraciones y la coordinación interna

[6] https://www.madrid360.es/

[7] https://www.madrid.es/portales/munimadrid/es/Inicio/Medio-ambiente/Hoja-de-Ruta-hacia-la-neutralidad-climatica-en-/?vgnextoid=7c1395b79fde7710VgnVCM2000001f4a900aRCRD&vgnextchannel=3edd31d3b28fe410VgnVCM1000000b205a0aRCRD

interdepartamental mediante un grupo “Clima”, así como establecer las bases para la participación colaborativa y social de múltiples actores, constituyen factores clave para desbloquear una verdadera y profunda transformación.

En este sentido, **la Misión Europea de Ciudades Climáticamente Neutras e Inteligentes**, representa una oportunidad única para la ciudad de Madrid en su objetivo de acelerar su descarbonización, identificando tres motivaciones principales:

1. El concepto de "Misión" proporciona una fuerza de cohesión inspiradora hacia un cambio transformador que pueden adoptar por igual los organismos públicos, las grandes corporaciones y las PYME, la academia, así como todos y cada uno de los ciudadanos.
2. La Misión constituye un marco más amplio que los ciclos habituales de proyectos locales en términos de tiempo y escala, necesario para abordar retos complejos que implican un cambio sistémico en una gran ciudad.
3. La Misión proporciona herramientas innovadoras como los "acuerdos climáticos" (climate city contracts), los planes de financiación y los elementos de comunicación ofreciendo todo un conjunto de recursos para articular una nueva forma de hacer las cosas de cara al desarrollo de políticas climáticas.

Estos tres factores **-compromiso interno, aprendizaje conjunto y nuevas herramientas de planificación y aplicación-** constituirán una base sólida para aumentar la ambición climática hacia la neutralidad para 2030 en una vía honesta y creíble.

Finalmente, es importante destacar que la ciudad de Madrid está trabajando para combinar los activos existentes a fin de poner en marcha un proceso estratégico, guiado por los ambiciosos objetivos de la Hoja de Ruta hacia la Neutralidad Climática, en conjunto con el resto de las políticas, estrategias y normativas que se pueden encontrar en el plan de acción climática de este Acuerdo, reflejado en la tabla A-2.1 del Anexo I.

Destacar también la participación de la ciudad en la **Plataforma Nacional de ciudades españolas para la neutralidad climática CitiES2030**, proyecto impulsado por el Ministerio para la Transición Ecológica y el Reto Demográfico a través de la Fundación Biodiversidad, así como en la red europea NetZeroCities (NZC) y el trabajo en una cartera de proyectos transformadores conectados con acciones de mitigación y adaptación climática.

El presente **Acuerdo Climático es un documento vivo y en continua evolución**, que busca establecer los principales objetivos, prioridades y principios clave para lograr la neutralidad climática en la ciudad de Madrid. De esta forma se mantiene el compromiso de la ciudad para continuar trabajando y mejorando los planes y acciones que ya están en marcha.

Objetivo de neutralidad climática para 2030

Los objetivos comprometidos por el Ayuntamiento de Madrid en la Hoja de Ruta hacia la neutralidad climática pasan por reducir los Gases de Efecto Invernadero (GEI) en un 65% para 2030 (en comparación con los niveles de 1990), y alcanzar la neutralidad climática en 2050. Ser elegida ciudad "Misión" por la Comisión Europea supone un importante impulso para acelerar el proceso de transformación y alcanzar estos objetivos antes del tiempo marcado inicialmente para el conjunto de la ciudad, a través de la creación de zonas y entornos donde esta neutralidad climática sea una realidad en 2030. Además, la Hoja de Ruta hacia la neutralidad climática contempla un "escenario extendido" aún más ambicioso en sus objetivos de reducción para 2030 cuya viabilidad técnica, económica y social solo sería posible con un Acuerdo Climático que ponga en marcha innovadoras herramientas y mecanismos transformadores. Este Acuerdo inicia las vías para poder explorar cómo se podría desarrollar dicho 'escenario extendido', de forma que la ciudad pueda establecer objetivos más ambiciosos sobre la descarbonización de sus sistemas.

La visión de Madrid hacia la neutralidad climática en el contexto de la Misión se centra en la dimensión social como principal motor del cambio, creando grandes áreas con límites geográficos específicos en las que todos los sectores y sistemas se hayan transformado y donde la neutralidad pueda percibirse como una experiencia vivida. En este sentido, la Misión ofrece el necesario enfoque sistémico de acciones que confluyen en un ámbito y fortalece el carácter de equidad e inclusión social al priorizar el concepto de alcanzar los objetivos de neutralidad por y para los ciudadanos.

La ciudad de Madrid tiene una superficie de 60.445,5 hectáreas y 3.286.662 habitantes (a fecha 1 de enero de 2022), lo que equivale a una densidad media de 54 habitantes por hectárea, siendo la ciudad más poblada del conjunto de ciudades participantes en esta iniciativa europea. Debido al tamaño y la complejidad de nuestra ciudad, se aborda la Misión en tres niveles de intervención con acciones concretas sobre entornos que, si bien tienen un ámbito geográfico delimitado, presentan unas características especiales que extienden su potencial de impacto al conjunto del municipio:

+ **Nuevos desarrollos urbanísticos climáticamente neutros.** Una nueva forma de hacer la ciudad del futuro integrando la innovación climática en el diseño urbanístico y su gestión.

+ **Generación de una nueva cultura de los ciudadanos del futuro** mediante la intervención en centros educativos y campus universitarios cero emisiones, que permita atraer el talento y avanzar hacia una sociedad con mayor conocimiento y compromiso frente a este desafío global.

+ **Una red de equipamientos y espacio público** que actúen como nodos de neutralidad climática para la transformación y regeneración de la ciudad consolidada, promoviendo el cambio hacia una ciudad más natural, más cohesionada y con una mayor calidad de vida.

Anualmente el Ayuntamiento de Madrid publica el 'Inventario de emisiones de gases de efecto invernadero[8]' que permite hacer un seguimiento de la evolución de las emisiones en el camino hacia la neutralidad. Aunque la tendencia en estos años es claramente decreciente, resulta necesario acelerar el ritmo de abatimiento de emisiones para cumplir los objetivos planteados por la ciudad y complementar las estrategias en marcha con enfoques innovadores para el desarrollo de la acción climática.

Los impactos climáticos se están haciendo cada vez más complejos debido a la interacción y efectos en cascada de múltiples episodios extremos. Acelerar los planes y medidas de mitigación y adaptación al cambio climático en la ciudad de Madrid

8 https://www.madrid.es/UnidadesDescentralizadas/Sostenibilidad/EspeInf/EnergiayCC/04CambioClimatico/4aInventario/Ficheros/InfGEI_INV2020_acc.pdf

garantizará la salud de ciudadanía, así como la transición hacia modos de vida más sostenible, mejorando las condiciones de habitabilidad al mismo tiempo que la actividad económica se fortalece.

El camino hacia la neutralidad implica una evolución de muchos de los modelos urbanos actuales y una transformación social y económica. En este proceso, debe destacarse la importancia de los cobeneficios que van a producirse de manera asociada a las acciones de mitigación y adaptación al cambio climático. A la reducción de los impactos climáticos se añaden los múltiples beneficios que proporcionan, desde la mejora de la calidad del aire, la protección de los ecosistemas y biodiversidad urbana, la funcionalidad de los espacios públicos, el estímulo de economías locales y empleo verde, así como beneficios asociados a una reducción de costes en la gestión del agua, la energía, los residuos, los seguros de riesgos, entre un sinfín de otros efectos.

Prioridades e intervenciones estratégicas

La ciudad de Madrid aborda la Misión con una visión sistémica de toda la ciudad y con tres intervenciones estratégicas prioritarias:

+ **Nuevos desarrollos de ciudad climáticamente neutros** - El principal exponente ya en marcha es el ámbito Madrid Nuevo Norte, con la visión de convertirse en el mayor desarrollo urbanístico con un modelo energético electrificado (emisiones cero) de Europa, y cuya experiencia es transferible a otros ámbitos y nodos urbanos de actividad económica. Este proyecto de regeneración urbana (3,3 km^2) plantea una nueva forma de planificación urbana que integra la innovación climática en términos de tecnología y soluciones basadas en la naturaleza desde la fase de diseño y dentro de una fuerte colaboración público-privada. Con el apoyo de la Misión, la experiencia podría extenderse a otros proyectos urbanísticos.

+ **Nueva cultura para los ciudadanos del futuro,** a través de la intervención en campus universitarios y escuelas transformadas en entornos climáticamente neutros. Los estudiantes son los que darán forma a las ciudades como futuros

prescriptores, y la generación de talento y capacidad investigadora en los aspectos claves de la transición energética hacia modelos de neutralidad constituye una intervención estratégica de primer orden. Madrid alberga la mayor población universitaria de España y en su término municipal se encuentran tres grandes campus (6,5 km^2) cuya transformación tiene un impacto directo significativo. Fortalecer el binomio ciudad-universidad para propiciar nuevas mentalidades en todas las disciplinas es un motor principal de transformación en la Misión Madrid.

+ **La transformación y regeneración de la ciudad consolidada con los equipamientos, el espacio público y otras instalaciones públicas,** actuando como nodos de neutralidad en los que la acción de la administración se conecte con otros actores urbanos sobre el territorio a través de acciones como comunidades energéticas, diseño participado de entornos, modos de movilidad compartidos, etc., integrando también a socios privados en los distritos empresariales y aprovechando el impulso creado por la Misión. Una intervención catalizada desde el Ayuntamiento con múltiples centros de transformación acelerada repartidos por toda la ciudad impulsará la regeneración de los barrios y la descarbonización.

Estas intervenciones estratégicas son coherentes y se integran en la política local de acción climática definida por la **Estrategia de Sostenibilidad Ambiental Madrid 360 y el documento técnico de la Hoja de Ruta hacia la neutralidad climática de la ciudad de Madrid** que deriva de ella. Además, el conjunto de la Misión Madrid hacia la neutralidad climática y, en particular, estas intervenciones en las que se hace imprescindible una estrecha colaboración entre administraciones cuentan con el respaldo de la Comunidad de Madrid a través del Plan de Descarbonización y Cuidado del Medio Ambiente y de la próxima Estrategia de Energía, Clima y Aire Horizonte 2030. No cabe entender la Misión Madrid de forma aislada al contexto regional.

La intervención sistémica en estos ámbitos de neutralidad climática supone un cambio de paradigma en la forma de abordar las acciones, que abandonan el enfoque sectorial tradicional y afrontan de forma integral los modelos actuales, poniendo el foco en modificar patrones de uso para reducir emisiones en origen. De esta forma se analizan las intervenciones con una filosofía centrada en 'Evitar-Cambiar-Mejorar':

+ **Evitar emisiones:** urbanismo de proximidad, creación de zonas de bajas emisiones de especial protección, rehabilitación y eficiencia energética, reducción de viajes obligados, minimización de residuos, entre otras.

+ **Cambiar el modo a opciones y soluciones menos contaminantes**: como la electrificación de la demanda energética en los distintos sectores, el impulso de la movilidad activa ampliando la red ciclista y peatonal, o el impulso del uso del transporte público cero emisiones.

+ **Mejorar a través del desarrollo tecnológico que permita minimizar el impacto de las soluciones adoptadas:** descarbonización del sistema eléctrico mediante la generación distribuida de origen renovable o mejorar y electrificar el parque circulante.

Esta perspectiva se concreta en **proyectos transformadores que inciden de forma transversal en distintos sectores y palancas de cambio**. Estos proyectos que se integran en el plan de acción para la neutralidad climática conectan visiones y disciplinas habitualmente aisladas, catalizando una transformación del conjunto del ámbito.

Todo ello exige un esfuerzo sin precedentes para **trabajar de forma colaborativa con múltiples partes interesadas,** para conectar los intereses y motivadores de los ciudadanos, sector privado, academia y administraciones presentes en la ciudad de Madrid.

Principios y proceso

La ciudad de Madrid ha establecido unos principios clave que guían su Hoja de Ruta hacia la neutralidad climática y refuerzan su papel como modelo de experimentación e innovación:

+ **Gobernanza climática**. Sobre la base de un sólido mandato político que hace de la neutralidad climática un "proyecto ciudad" prioritario y transversal al conjunto de acciones municipales, se ha iniciado un proceso de revisión y actualización de normas y herramientas administrativas (normas urbanísticas, ordenanzas fiscales, ordenanzas ambientales, cuadro de precios, instrucciones

de contratación...etc.) para crear un entorno regulatorio favorable a la consecución de los objetivos de neutralidad y adaptación. Así, por ejemplo, la nueva Ordenanza de Calidad del Aire y Sostenibilidad (2021) crea la figura de Áreas Demostradoras de Acción Climática, en las que se intensificarán medidas que permitan avanzar en los objetivos de neutralidad climática, siendo los entornos seleccionados por la Misión Madrid (Madrid Nuevo Norte y Campus universitarios) los primeros objetivos. La adecuada coordinación de la acción climática en el conjunto de políticas municipales se estructura mediante una Comunidad de Conocimiento "Clima" de carácter interdepartamental, compuesta por altos responsables de diferentes Áreas de Gobierno de la ciudad, tales como Cultura, Urbanismo, Economía e Innovación, Internacionalización, Hacienda y RRHH, liderada por el Área de Medio Ambiente y Movilidad, en la que existe una unidad específica (SG Energía y Cambio Climático) con personal técnico dedicado. Esta comunidad de conocimiento, apoyada por un programa específico de la Escuela de Formación Municipal, brinda no solo un espacio de colaboración, sino también de reflexión y aprendizaje.

+ **Seguimiento innovador y transparencia**. Madrid está desarrollando el sistema e-Misión para el diagnóstico avanzado, simulación y evaluación de escenarios de fuentes emisoras de GEIs en la ciudad. Esta plataforma complementa el inventario de emisiones, al permitir conocer las emisiones de gases de efecto invernadero con una mayor granularidad territorial (escala de los 131 barrios en los que se divide el municipio de Madrid) y temporal (actualizaciones trimestrales) procedentes de las principales fuentes emisoras de la ciudad (movilidad, sector residencial y servicios). De esta forma se facilita la evaluación y simulación del impacto de las acciones municipales con mayor grado de detalle y el análisis territorial comparado de las tendencias en emisiones. Constituye una herramienta innovadora y con una interfaz abierta al ciudadano para el seguimiento de la Misión hacia la neutralidad climática de Madrid. Además, para las Áreas de Demostradoras de Acción Climática se generarán "gemelos digitales" en colaboración con la Oficina Digital del Ayuntamiento y actores privados, con el objetivo de digitalizar los principales flujos de energía y generar nuevas vías de colaboración en el desarrollo de iniciativas de ciencia ciudadana asociados a la experiencia real de entornos neutros.

+ **Participación y dimensión social.** Madrid afronta el reto de la neutralidad climática como un desafío eminentemente social, ya que no es la tecnología sino las personas con sus acciones y decisiones las que pueden dar lugar a una transformación con la escala y urgencia que se precisa. Una visión exclusivamente tecnológica puede incrementar las desigualdades sociales y territoriales, generando una "brecha climática" que impida el acceso de determinados sectores sociales a soluciones y sistemas urbanos de bajas emisiones. Para garantizar la equidad y la inclusividad de la acción climática el proceso de la Misión Madrid incorpora un esquema de trabajo basado en procesos de acercamiento y escucha a la realidad social mediante un trabajo conjunto con los distritos, canales de participación para los distintos proyectos tractores de la neutralidad y colaboración con entidades especializadas en la acción social (Cruz Roja, Oxfam, Porticus, EAPN, Cáritas). Por otra parte, y en lo que respecta a la variable de adaptación frente a los efectos del cambio climático que está íntimamente ligada a la Misión de neutralidad, la consideración de grupos con especial vulnerabilidad a, por ejemplo, incremento de temperaturas y olas de calor, tiene un relevante protagonismo en las medidas de evaluación de riesgos y planes de acción.

+ **Talento.** La ciudad de Madrid tiene la ambición de convertirse en un polo de conocimiento y aprendizaje en materia de acción climática y ya ha adquirido una valiosa experiencia, generando un binomio universidad-ciudad a través de colaboraciones con la Academia (Climate-KIC Deep DEMO). Como herramientas de activación Madrid ha planteado la intervención prioritaria en campus universitarios cero emisiones, para generar entornos donde experimentar en primera persona la neutralidad climática y un programa de creación de Cátedras Misión de innovación climática que acompañen este proceso hacia la neutralidad de los campus. El papel universitario no se limita a la innovación científico-técnica, sino que recoge también acciones de innovación social en los que la comunidad estudiantil, en su papel de ciudadanos-prescriptores del futuro, conecten y activen los procesos de comunicación, sensibilización e implicación ciudadana.

+ **Trabajo en red.** La ciudad de Madrid ha dejado siempre patente su convicción de que es esencial aprender unos de otros si se quiere llegar lejos y hacerlo rápido como exigen las circunstancias. A partir de alianzas, convenios y espacios de colaboración público-privada ya existentes que vinculan a las

empresas, las instituciones públicas y la sociedad (por ejemplo, Madrid Futuro, empresas energéticas, Foro de Empresas por Madrid, etc.) se plantea la creación de una Plataforma Local de Acción Climática con empresas, agentes sociales y otros actores urbanos relevantes en la que aunar compromisos y proyectos que generen sinergias en la ciudad de forma rigurosa y verificable. Por otra parte, la dimensión global y compleja de la crisis climática requiere que este trabajo en red no se limite a la esfera local, resultando fundamental la conexión con otras ciudades para compartir conocimiento y experiencia. En este sentido, Madrid forma parte de la "Plataforma de Colaboración para la Neutralidad Climática de las Ciudades Españolas" (citiES 2030) promovida por el Ministerio para la Transición Ecológica y el Reto Demográfico, y atesora una amplia experiencia en iniciativas internacionales como la del Grupo de Liderazgo de Ciudades C40, el Pacto de Alcaldes por el Clima y la Energía o la red EUROCITIES, así como participación en proyectos europeos de investigación, desarrollo tecnológico, demostración e innovación.

Apoyo del Gobierno a la neutralidad climática de las ciudades Misión

A través de la **Declaración suscrita por la Vicepresidenta Tercera del Gobierno y Ministra para la Transición Ecológica y el Reto Demográfico**, que figura como anexo al presente documento, el Gobierno de España expresa su compromiso con el proceso de transformación de la ciudad seleccionada por la Comisión Europea el 28 de abril de 2022 para participar en la Misión Europea de Ciudades.

Apoyo de la Comunidad Autónoma de Madrid a la neutralidad climática de la ciudad de Madrid

Por su parte, el Gobierno de la **Comunidad Autónoma de Madrid,** como actor clave en la gobernanza multinivel necesaria para la consecución del objetivo de una ciudad climáticamente neutra, inclusiva, segura, resiliente y sostenible, ha demostrado su ambición en la transición hacia la neutralidad climática de la región a través del Plan de Descarbonización y Cuidado del Medio Ambiente y de la próxima Estrategia de Energía, Clima y Aire Horizonte 2030.

No cabe entender la Misión Madrid de forma aislada al contexto regional. El apoyo y los compromisos específicos de la Comunidad Autónoma hacia la neutralidad climática de la ciudad de Madrid se refleja en la acción conjunta sobre la cartera de proyectos transformadores que exigen esta coordinación multinivel, tales como Madrid Nuevo Norte, como ejemplo de desarrollo urbanístico con cero emisiones directas, las estrategias de movilidad urbana-periurbana o la generación de infraestructuras verdes para acercar la naturaleza a los ciudadanos conectando los Parques Regionales y otros espacios naturales al núcleo urbano para favorecer, conservar y proteger la biodiversidad.

Seguimiento, actualización y modificación del Acuerdo Climático y sus Anexos

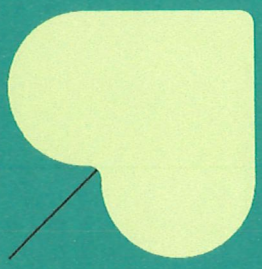
Este documento y sus Anexos, que forman parte integrante de la misma, se *configuran en el marco de un* **proceso iterativo, como un documento dinámico y flexible que estará sujeto a seguimiento, actualización y modificación** con la finalidad de revisar y ajustar los compromisos, acciones y/o inversiones necesarias para alcanzar los objetivos de neutralidad climática de la Ciudad.

Los firmantes se comprometen a hacer un seguimiento, al menos, bienal del progreso de los compromisos asumidos en este Acuerdo y sus Anexos y a su debida actualización. Este seguimiento y actualización se establecen sin perjuicio de que en los distintos Anexos se recojan metodologías concretas de monitorización, revisión y actualización.

Cuando resulte necesario para la mejor realización de su objetivo, no afecte a su propósito esencial y siempre que suponga una concreción, mejora o revisión al alza de los objetivos y compromisos asumidos, los firmantes podrán introducir modificaciones en la misma y/o en cualquiera de sus Anexos. Estas modificaciones se realizarán, preferentemente, en el marco del seguimiento bienal y se remitirán a las demás partes firmantes a efectos informativos.

José Luis Martínez-Almeida Navasqüés
Alcalde de Madrid

28 MAR 2023



Madrid