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Madrid Climate City Contract

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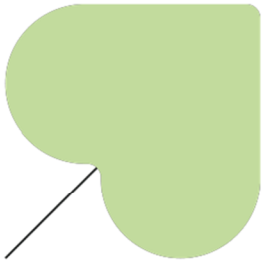

Madrid

Index

Introduction

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 to promote its role as centres of experimentation and innovation in the transition to climate neutrality.

At the European level, 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 before 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", 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 by them, 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 and the citiES 2030 initiative. 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 very positively 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 in the Mission, to which 377 where presented. On 28 April 2022, 100 were selected from them, 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 Climate City Contract 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. 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 Contract is divided into several parts: one concerning the cities' commitment towards climate neutrality by the city and the Spanish Gobernment and, where appropriate, by other 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.

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 these networks and alliances, among which the following stand out:

- Take part in the creation of C40 network, in October 2005 in London, developing since then and continuously developing un active role in the prevention and fight against climate change.
- The approval by the Municipal Plenary of the adhesion to the Covenant of Mayors (Covenant of Mayors[1]), in November 2008, obliging it to exceed the target set by the European Union (EU) to reduce GHG emissions.
- Subsequently, in July 2014, the Plenary agreed to approve the adhesion of Madrid City Council to the Mayors Adapt[2] initiative.
- In September 2014, the Compact of Mayors initiative[3] 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, using a common methodology for the inventory of emissions at the urban scale. In 2024, Madrid obtained the highest A rating in the Carbon Disclosure Project (CDP) transparency and disclosure system.
- Subsequently, in 2018, Madrid City Council adheres to the 'Deadline 2020[4]' commitment promoted by the Cities Climate Change Leadership Network - C40, by which it commits to develop an action plan.

[1] https://eu-mayors.ec.europa.eu/en/home
[2] https://climate-adapt.eea.europa.eu/en/metadata/portals/mayors-adapt-the-covenant-of-mayors-initiative-on-adaptation-to-climate-change
[3] https://www.uclg.org/es/node/23789
[4] https://www.c40knowledgehub.org/s/article/Deadline-2020-How-cities-will-get-the-job-done?language=en_US

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 3605 , 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 and keeped on in 2023 and 2024. 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*, document 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[6] , 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

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

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

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.

The Roadmap is a living document, subject to review and designed to integrate new visions and updates. The following cross-sectional aspects stand out for their impact on the development of Madrid as a Mission City and in this iteration of the Climate City Contract:

- **Social dimension**: In 2024, a review process of the Roadmap was carried out from the social perspective. This review incorporates a work system based on processes of rapprochement and listening to social reality through joint work based on participation channels for the various driver projects of neutrality and collaboration with entities specialized in social action such as the Red Cross, Oxfam, Porticus, EAPN, Save the Children, among others. The incorporation of information and indicators associated with the risk of exclusion, such as the European AROPE indicator (At Risk of Poverty and/or social Exclusion) or tools that integrate the principle of not generating associated harm, based for example on the European DNSH principle (Do Not Cause Significant Harm to the Environment), allow for the integration of an ethical criterion applicable to the Roadmap that guides the allocation of resources towards concrete measures and actions that not only generate environmental benefits but also promote social equity.
- Adaptation: As a complement to the Roadmap, in May 2025 Madrid publishes the 'Climate Adaptation Action Plan: City of Madrid[7]', which sets out the specific objectives and actions the city must develop with respect to climate change adaptation. These are **eight objectives** —cooling the city, protecting and increasing urban biodiversity, optimizing water resource management, adapting municipal services and facilities, implementing governance for climate adaptation, promoting climate adaptation from a social, fair, and inclusive perspective, and assessing climate risk: monitoring and control—that

[7] https://www.madrid.es/UnidadesDescentralizadas/Sostenibilidad/EspeInf/Adaptación%20climática/ficheros/ClimateAdaptationActionPlanCityofMadridDigV.pdf

seek to increase Madrid's resilience to the adverse effects of climate change. The city of Madrid thus commits to include in a cross-cutting manner the climate change adaptation aspects in all its actions. In particular, it undertakes to continue assessing climate risks at the city level, in coordination with regional and/or metropolitan administrations, in order to ensure a coherent, effective response aligned with broader territorial frameworks.

- **Circular economy and low-carbon materials:** Promoting the decarbonization of the construction sector in cities through various student exchange and learning initiatives (such as the VISIBLE C40 project with the cities of Oslo and London) or the implementation of low-carbon projects such as the Iberia Loreto residential building by the *Empresa Municipal de Vivienda y Suelo* (EMVS, the head of housing policies of the Madrid City Council), the student residence in Vallecas (Campus for Living Cities), or the Butarque library.

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:

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 on a new Municipal Strategic Plan, "Sueña Madrid" a guiding urban planning tool that will define the basic elements for the organization and structure of the municipality, its strategic objectives, and the reference framework for all other urban planning instruments in the municipality. The new municipal strategy defines sustainability as one of the three axes

of action and has included a Climate Neutrality Roundtable in its first phase of participation and diagnosis, becoming a fundamental element of governance for achieving the objectives of the Mission by unifying all of the 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. This is why this iteration is developed to show 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.

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 3.527.924 inhabitants (as of 1 January 2025), which is equivalent to an average density of 58 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-

[8] https://www.madrid.es/UnidadesDescentralizadas/Sostenibilidad/EspeInf/AccionClimatica/2EstudiosInventarios/2aInventario/ficheros/AYTOMAD-EmissionsInvt_2022.pdf

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.

The city commitment to climate neutrality, in addition to responding to an environmental obligation, also addresses an urgent need to improve public health. Climate change mitigation policies represent an unprecedented opportunity to reduce the burden of disease arising from air pollution, ambient noise, extreme heat, and sedentary lifestyles. Acting now involves preventing respiratory, cardiovascular, neurodegenerative, and metabolic diseases, reducing premature mortality, improving mental health, and increasing the general well-being of citizens. Accelerating the energy transition, promoting active mobility, expanding green infrastructure, and reducing exposure to air pollutants are environmental measures that save lives, especially among the most vulnerable groups. Within this framework, climate action is also a health policy based on scientific evidence and criteria of social justice, as emphasized by organizations such as WHO/Europe and its Pan-European Commission on Climate and Health.

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. The Mission's drive has facilitate the creation of the

regulatory framework for a '*Área Demostradora de Acción Climática* (ADAC)', this is, a demonstration area where accelerate de climate action, concept proposed in the Air Quality and Sustainability Ordinance, being the 'Centro de Negocios Chamartín – Madrid Nuevo Norte' (Chamartín Business Center in the Madrid Nuevo Norte area) the first ADAC declared by the Madrid City Council (March 2023). Within the framework of the Mission, the ADAC Monitoring Committee has carried out an intensive work to implement the Action Plan approved for the area, creating working groups on energy, water, and biodiversity.

- **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 strengthening the city-university binomial to foster new mindsets in all disciplines is a major driver of transformation in Mission Madrid. A significant step forward in this iteration of the Climate City Contract is the signing of **three climate innovation agreements** with the three universities with major campuses (6.5 km2) whose transformation has a significant direct impact on the municipality: Universidad Complutense, Universidad Politécnica y Universidad Autónoma.

- 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. Urban interventions with climate criteria in **school environments** are an example of the development of this axis of action in this iteration of the Climate City Contract.

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 and the technical document *Climate Adaptation Action Plan City of Madrid* (May 2025) that complements 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** (ADAC, as mentioned above), 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 and multi-level 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 (Energy and Climate Change Sub Directorate) 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 (SIMAD Climate and Air tool). 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. 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 and 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). 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 ‘Convenios’, a kind of agreement for urban climate innovation actions with the three universities with campuses in the municipality, signeds in 2024 by first time. 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.

Spanish Government 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.

The Government of Spain supports the transformation of cities to achieve climate neutrality and intends to contribute to the energy and ecological transition of cities with at least the following actions:

- Create and support the collaborative Platform for the Climate Neutrality of Spanish Cities, a public action infrastructure that supports and accelerates the sustainable transformation of Spanish cities. The platform will offer member cities a series of services, including: training, learning, and capacity building; support for the development of local systemic innovation platforms for the design of transformative project portfolios; assistance in drafting and monitoring the Climate City Contracts and designing roadmaps in a multi-stakeholder environment; connection with similar processes in other European cities; multi-city projects incubation; citizen participation and activation; assistance to cities in structuring transformation financing plans, involving stakeholders from the financial sector; and strategic communication.

- Establish co-governance for European Funds aimed at climate-neutral cities with an integrated vision: promote greater participation of cities in the definition and management of funds, as an essential tool for urban transformation towards climate-neutrality.

- Strengthen financing for the implementation of comprehensive actions that address climate action transversally: development of public procurement, regulation, and financing mechanisms, from the perspective of the benefits and co-benefits in the fight against climate change.

- Push forward the implementation of tax incentives: develop the measures necessary to overcome the crisis and achieve a green tax reform that provides an incentive for a new cycle of investment and innovation in line with climate

change mitigation and adaptation policies, and acts as an accelerator towards an ecological transition that can reflects adequately the value of ecosystems.

- ● Promote legislative changes that simplify bureaucracy and improve capacities and processes, increasing the effectiveness and efficiency of investments originating from European funds in cities.

- Establish regulatory instruments that facilitate urban systemic innovation such as “sandboxes”.

The Government also undertakes to monitor and update these general commitments with the signatory Cities.

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 current and future signatories undertake to monitor annually 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.

The Annexes corresponding to the Climate Neutrality Action Plan (Annex I), the City's Climate Neutrality Investment Plan (Annex II) and the City Stakeholders and Commitments Plan (Annex III), which will follow the templates developed by NetZeroCities, will be incorporated into this Contract, after prior notification to the other signatory parties.

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

citiES 2030

Declaración de apoyo del Gobierno a la neutralidad climática de las ciudades Misión españolas

Dejo constancia del compromiso de apoyo del Gobierno de España a los "acuerdos de neutralidad climática" presentados por las ciudades seleccionadas por la Comisión Europea el 28 de abril de 2022 para participar en la Misión Europea de Ciudades: Madrid, Barcelona, Sevilla, Valencia, Zaragoza, Valladolid y Vitoria-Gasteiz.

Este apoyo, para contribuir a la transformación ecológica y energética de las ciudades y a una mayor resiliencia climática y social, se materializa en el marco de las competencias del Estado, entre otros, en los siguientes aspectos:

1. **El impulso de un marco regulatorio alineado con la innovación sistémica y la colaboración público-privada** que requiere la Misión Europea de Ciudades. En este contexto, destaca:

    + La Agenda Urbana Española, aprobada en febrero de 2019, que pone de manifiesto la necesidad de lograr la sostenibilidad en las políticas de desarrollo urbano. Se constituye como un método de trabajo y un proceso para todos los actores que intervienen en las ciudades y que aspiran a un desarrollo equitativo, justo y sostenible desde los distintos campos de actuación. Esta estrategia se desarrolla en torno a 30 objetivos específicos y 291 líneas de actuación, que incluye a todos los pueblos y ciudades con independencia de tamaño y población, y aborda la sostenibilidad económica, social y medio ambiental.

    + La Ley 7/2021, de 20 de mayo, de cambio climático y transición energética. Marco institucional que garantiza, a través de sus distintas medidas, la coordinación de las políticas sectoriales, asegurando coherencia entre ellas y sinergias para alcanzar el objetivo de la neutralidad climática y aumentar

nuestra capacidad de adaptación ante los efectos adversos del cambio climático.

El compromiso de trabajar en los desarrollos reglamentarios de la Ley es claro. Por las implicaciones que tiene para la Misión de ciudades, se destacan los siguientes: i) en el ámbito energético, se trabaja en el establecimiento de un marco para desplegar eficiencia energética en industrias y edificios y las energías renovables como vectores hacia la descarbonización, ii) en materia de movilidad sin emisiones, se recoge el mandato a las ciudades para que adopten planes de movilidad urbana sostenible con medidas de mitigación, como las zonas de bajas emisiones, iii) en materia de contratación verde, se trabaja para establecer medidas que integren la lucha contra el cambio climático en los procedimientos de contratación pública, como son la inclusión como prescripciones técnicas particulares en los pliegos de contratación de criterios de reducción de emisiones y de huella de carbono dirigidos específicamente a la lucha contra el cambio climático.

2. **La puesta en marcha de la Plataforma de Colaboración para la Neutralidad Climática de las Ciudades Españolas (citiES 2030)**, una herramienta creada *ad hoc* y ya en funcionamiento para facilitar la implementación de la Misión de Ciudades.

   El Gobierno de España, con la implementación de esta plataforma, no solo permite dar cumplimiento a una de las actividades iniciales de la Misión, sino que se convierte en referente para los demás países y ciudades del programa.

   Esta plataforma es una infraestructura de innovación y colaboración multiactor para apoyar y acelerar la transformación de las ciudades españolas hacia la neutralidad climática.

   La plataforma tiene como principales beneficiarios a los Ayuntamientos de las ciudades españolas de más de 50.000 habitantes o capitales de provincia que tengan la voluntad de alcanzar la neutralidad climática total o parcialmente en 2030, así como a las ciudades de más de 20.000 habitantes que quieran iniciar este proceso.

La plataforma ofrece a las ciudades una serie de servicios, entre los que destacan:

+ la formación, aprendizaje y fortalecimiento de capacidades;
+ el apoyo al desarrollo de plataformas de innovación sistémica locales para el diseño de carteras de proyectos transformadores;
+ la asistencia para la redacción y seguimiento de los acuerdos climáticos de ciudad y el diseño de hojas de ruta en un entorno multiactor;
+ la conexión con procesos similares en otras ciudades europeas; la incubación de proyectos multiciudad; la participación y activación ciudadana;
+ la asistencia a las ciudades para la estructuración de planes de financiación de la transformación, involucrando a actores del ámbito financiero; y
+ la comunicación estratégica.

La gobernanza de la Plataforma es multiactor y multinivel, con el objetivo de facilitar, ordenar y garantizar direccionalidad y estabilidad en estas colaboraciones. De esta manera, cuenta con la participación de los actores de la quíntuple hélice:

+ sector público (administraciones y agencias públicas).
+ sector privado (empresas, sector financiero, sector de infraestructuras urbanas y asociaciones profesionales).
+ academia (universidades y centros de investigación).
+ sociedad civil (ONGs y asociaciones de vecinos).
+ medios de comunicación.

3. **El apoyo a la movilización de inversiones verdes.** Un buen ejemplo es el despliegue del Plan de Recuperación, Transformación y Resiliencia a través de la movilización de un volumen de inversión sin precedentes que prioriza no sólo paliar los efectos de la crisis, sino también la transformación de nuestro país hacia una economía sostenible e inclusiva.

   El Plan reconoce el papel fundamental de las ciudades en la transformación económica y social, por su capacidad de generar actividad a corto plazo con efecto tractor sobre la industria y sectores clave, y su importancia frente a la emergencia climática. Así, se recogen de iniciativas destinadas a aspectos esenciales para la neutralidad climática de las ciudades como:

   + La mejora de la movilidad sostenible, con el impulso del vehículo eléctrico y de pila de combustible y la extensión de las infraestructuras de recarga, a través de los diferentes programas MOVES.

   + El impulso de la rehabilitación de los entornos residenciales urbanos, viviendas, edificios y barrios, con el objetivo prioritario de reducir en consumo energético e impulsar la descarbonización en el parque residencial.

   + El desarrollo de comunidades energéticas, que impulsen la innovación social y la participación ciudadana en renovables, eficiencia energética o movilidad eléctrica, contribuyendo con ello a una descarbonización justa e inclusiva en ámbitos urbanos.

   + El impulso del autoconsumo para el aprovechamiento energético de los tejados y cubiertas urbanos, el almacenamiento detrás del contador y la climatización renovable en hogares.

   + El desarrollo de estrategias e iniciativas transformadoras de renaturalización urbana, favoreciendo el incremento de la infraestructura verde y la biodiversidad en ciudades españolas y favoreciendo las Soluciones Basadas en la Naturaleza para dar respuesta a sus desafíos socioambientales.

+ El apoyo a la implementación de la normativa de residuos, en colaboración con las CCAA y las ciudades, y con inversiones en digitalización en materia de gestión ambiental, a través del PRTR.

+ El despliegue de convocatorias de ayudas a municipios y entidades locales para la implantación en las ciudades de zonas de bajas emisiones y la transformación sostenible y digital del transporte urbano.

4. **El seguimiento de los avances del conjunto de las siete ciudades a través de la información procesada en la Plataforma de Colaboración citiES 2030**, con el objetivo de integrar la hoja de ruta de transformación urbana en el conjunto del proceso de descarbonización del país.

En el marco del proceso iterativo de la Misión Europea de Ciudades, el Gobierno participará en el seguimiento y actualización de los compromisos asumidos en las declaraciones de neutralidad climática de las ciudades de Barcelona, Madrid, Sevilla, Valencia, Valladolid, Vitoria-Gasteiz y Zaragoza, apoyando el reconocimiento y divulgación de los avances alcanzados.

Teresa Ribera Rodríguez
Vicepresidenta Tercera y
Ministra para la Transición Ecológica y el Reto Demográfico

MINISTERIO
PARA LA TRANSICIÓN ECOLÓGICA
Y EL RETO DEMOGRÁFICO

DECLARACIÓN DE APOYO DEL GOBIERNO A LA NEUTRALIDAD Y RESILIENCIA CLIMÁTICA DE LAS CIUDADES ESPAÑOLAS

El Gobierno de España, mediante la presente Declaración, reitera su firme compromiso y voluntad de seguir avanzando hacia una agenda ambiental y climática que sea también una agenda para una **Sociedad del Bienestar**. Una agenda que proteja los ecosistemas y garantice la salud, la prosperidad y una transición justa para toda la ciudadanía.

La ciencia lleva décadas advirtiéndonos sobre la aceleración del cambio climático y sus consecuencias, cada vez más intensas y frecuentes. Pero aún estamos a tiempo de actuar y conocemos las oportunidades que la transición ecológica nos ofrece: cuanto antes actuemos, mayor será nuestra capacidad de adaptación, menores serán los costes y menos profundas serán las desigualdades, especialmente en las poblaciones más vulnerables. Afrontar el cambio climático es una oportunidad única para transformar nuestras ciudades en espacios más sostenibles, resilientes y cohesionados, y para construir un futuro más justo, seguro y próspero para las próximas generaciones.

Las ciudades, donde reside la mayoría de la población y donde se concentran el consumo energético y las emisiones, tienen un papel clave en esta transición verde.

Por ello, subrayamos el **valor transformador de las ciudades como** espacios de experimentación e innovación, con nuevas formas de gobernanza y participación ciudadana que sean motores de cambio frente a los grandes retos urbanos de nuestro tiempo.

Este proceso de transformación debe discurrir en paralelo a un importante esfuerzo de **adaptación de las ciudades a los nuevos escenarios climáticos**. Necesitamos espacios urbanos preparados para afrontar riesgos diversos y agravados: temperaturas en aumento y episodios de calor extremo, sequías, lluvias torrenciales e inundaciones, entre otros. Y necesitamos una administración y una ciudadanía más consciente y capacitada para responder adecuadamente a dichas amenazas.

Los **ecosistemas urbanos** representan un 22% de la superficie terrestre de la Unión Europea aportando hábitats importantes para la biodiversidad. Su papel es fundamental para afrontar los grandes retos del cambio climático, ya que son los garantes de la calidad de vida y salud para sus habitantes.

Estos ecosistemas urbanos se articulan en la infraestructura verde urbana, como una red estratégicamente planificada y constituida por diferentes elementos naturales de diversos tamaños y tipologías (como parques, jardines, corredores verdes, arbolado, cubiertas verdes, fachadas verdes, huertos, espacios agrícolas y forestales, márgenes de ríos en sus tramos urbanos, espacios de transición hacia el entorno no urbanizado, etc.), que potenciará el efecto de capilaridad verde y conectividad ecológica, mejorando a su vez los flujos de biodiversidad que garantizan su calidad.

Las **soluciones basadas en la naturaleza** han demostrado ser rentables en términos de coste-beneficio y eficaces en este proceso, impulsando la renaturalización y, con ello, obteniendo resultados en la mejora de la calidad del aire, la reducción de la temperatura urbana, en la reducción del efecto de isla de calor y el riesgo de incendios; la gestión sostenible del agua, reducción de inundaciones, mejora de infiltración y recarga de acuíferos; la promoción de la biodiversidad urbana y resiliencia ecológica y en el fortalecimiento del bienestar físico y mental de la ciudadanía.

Esta Declaración supone también un paso más hacia una agenda de salud urbana, orientada a mejorar la calidad ambiental en nuestras ciudades y núcleos urbanos, garantizar entornos saludables y avanzar hacia el objetivo de contaminación cero. En este sentido, trabajamos para asegurar el cumplimiento de la **Ley de Cambio Climático**, en especial lo relativo a las **Zonas de Bajas Emisiones**, y seguimos fortaleciendo la implementación de políticas alineadas con estos objetivos.

Desde este Gobierno **seguimos, por tanto, apostando por una transformación real de nuestras ciudades.** El Plan Nacional Integrado de Energía y Clima 2023-2030 (PNIEC 2023-2030) profundiza en la transformación de las ciudades con el despliegue de zonas e itinerarios peatonales y el impulso del uso de la bicicleta con la construcción de carriles bici, la adecuación de vías y el espacio urbano, la habilitación de aparcamientos seguros y el despliegue de servicios de alquiler de bicicletas o medidas para calmar el tráfico rodado.

La actualización del PNIEC refuerza el compromiso con la movilidad sostenible y recoge los avances logrados en los últimos años en España gracias a instrumentos como la Estrategia de Movilidad Segura, Sostenible y Conectada 2030, el Plan de Recuperación, el Proyecto de Ley de Movilidad Sostenible o el Real Decreto 1052/2022, que regula los requisitos mínimos de las Zonas de Bajas Emisiones conforme a la Ley de Cambio Climático.

Se refuerza asimismo nuestro compromiso con el **transporte público y colectivo**, incluyendo un impulso al ferrocarril y al desarrollo de soluciones digitales y sostenibles que mejoren la competitividad y la eficiencia del sistema de transporte.

Nos comprometemos también a seguir promoviendo la electrificación del parque móvil. En diciembre de 2025, hemos lanzado el Plan Auto+, dotado con 400 millones de euros en 2026 para ayudas directas a la compra de vehículos eléctricos; el lanzamiento de otro Moves Corredores, dotado con 200 millones, para desplegar puntos de recarga y 580 millones más para el PERTE VEC.

La **rehabilitación energética de los edificios existentes** y la construcción de **nuevos edificios con altos estándares de eficiencia** son esenciales para avanzar hacia ciudades climáticamente neutras, el PNIEC 2023-2030 contempla un incremento en el número de viviendas rehabilitadas hasta 1.377.000. Actuar sobre el entorno construido significa reducir las emisiones, mejorar el confort térmico, combatir la pobreza energética y generar empleo local de calidad. En este contexto, es prioritario acelerar la electrificación de los usos térmicos, impulsar el autoconsumo y las comunidades energéticas, promover soluciones basadas en energías renovables y avanzar hacia distritos de energía positiva. El **PNIEC 2023-2030** refuerza esta visión y establece medidas específicas para descarbonizar el sector de la edificación. En este camino hacia la descarbonización de las ciudades, la **transformación del parque edificado constituye una de las palancas clave** para alcanzar, también, los objetivos de la Misión de «ciudades inteligentes y climáticamente neutras» de la Unión Europea.

Por su parte, el **Plan Nacional de Adaptación al Cambio Climático** (PNACC) incluye a la ciudad y el urbanismo y la edificación entre sus campos de intervención prioritarios, ante la evidencia de que los espacios urbanos están sujetos a riesgos específicos que exigen políticas que se anticipen a los impactos, incrementando la capacidad adaptativa y reforzando la resiliencia de los espacios urbanos.

El Ministerio para la Transición Ecológica y el Reto Demográfico apoya a las ciudades no solo a través de nuestras políticas, sino también **mediante instrumentos de financiación específicos**. Este Gobierno ha financiado el impulso de la plataforma española (citiES 2030) con 810.000€, se han destinado 218 millones de euros a proyectos de renaturalización y resiliencia urbana y, más concretamente, se han aprobado ayudas por un importe de 16,5M€ en ciudades de la Misión través de convocatorias públicas, y se está trabajando en el desarrollo de una nueva iniciativa de inversión público-privada dedicada a las ciudades de la Misión. Continuamos con nuestro compromiso de apoyo a las ciudades Misión y a

otras ciudades que quieran iniciarse en este camino con 1,9 millones de euros para la **Plataforma de Colaboración para la Neutralidad Climática** de las Ciudades Españolas, una infraestructura de acción pública orientada a prestar servicios técnicos y estratégicos, de capacitación, intercambio de conocimiento y experiencias y seguimiento de los acuerdos climáticos, que faciliten y aceleren la descarbonización y fortalezcan la resiliencia urbana. Con esta declaración, reafirmamos, por tanto, también nuestro compromiso para que las ciudades desarrollen e implementen los acuerdos climáticos en el marco de la Misión Europea

Seguimos comprometidos. Porque al final del camino está lo más importante: la salud de las personas. La implementación del PNIEC 2023-2030 permitirá reducir en un 49% las muertes prematuras asociadas a la mala calidad del aire respecto a los valores de 2019. Por su parte, la implementación del PNACC 2021-2030 hará posible que las olas de calor, cada vez más intensas, largas y frecuentes, no se traduzcan en un incremento equivalente de la mortalidad asociada al calor extremo. Tendremos aire más limpio, hogares mejor climatizados, espacios urbanos más amables y un menor gasto energético. **Ese es nuestro compromiso.**

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ANNEX 1:
Climate Neutrality Action Plan

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ANNEX I

CLIMATE NEUTRALITY ACTION PLAN IN THE CITY OF MADRID

Introduction

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.

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[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.

The Roadmap is a living document subject to review to integrate new visions and updates. The following cross-cutting aspects stand out for their impact on the development of Madrid as a Mission City and in this Iteration of the Climate Agreement:

The Roadmap is a living document, subject to review and designed to integrate new visions and updates. The following cross-sectional aspects stand out for their impact on the development of Madrid as a Mission City and in this iteration of the Climate City Contract:

- **Social dimension**: In 2024, a review process of the Roadmap was carried out from the social perspective. This review incorporates a work system based on processes of rapprochement and listening to social reality through joint work based on participation channels for the various driver projects of neutrality and collaboration with entities specialized in social action such as the Red Cross, Oxfam, Porticus, EAPN, Save the Children, among others. The incorporation of information and indicators associated with the risk of exclusion, such as the European AROPE indicator (At Risk of Poverty and/or social Exclusion) or tools that integrate the principle of not generating associated harm, based for example on the European DNSH principle (Do Not Cause Significant Harm to the Environment), allow for the integration of an ethical criterion applicable to the Roadmap that guides the allocation of resources towards concrete measures and actions that not only generate environmental benefits but also promote social equity.

- **Adaptation:** As a complement to the Roadmap, in May 2025 Madrid publishes the 'Climate Adaptation Action Plan: City of Madrid[3]', which sets out the specific objectives and actions the city must develop with respect to climate change adaptation. These are **eight objectives** —cooling the city, protecting and increasing urban biodiversity, optimizing water resource management, adapting municipal services and facilities, implementing governance for climate adaptation, promoting climate adaptation from a social, fair, and inclusive perspective, and assessing climate risk: monitoring and control—that seek to increase Madrid's resilience to the adverse effects of climate change. The city of Madrid thus commits to include in a transversal manner the climate change adaptation aspects in all its actions. It undertakes particularly to continue assessing climate risks at the city level, in coordination with regional and/or metropolitan administrations, in order to ensure a coherent, effective response aligned with broader territorial frameworks.

- **Circular economy and low-carbon materials:** Promoting the decarbonization of the construction sector in cities through various student exchange and learning initiatives (such as the VISIBLE C40 project with the cities of Oslo and London) or the implementation of low-carbon projects such as the Iberia Loreto residential building by the *Empresa Municipal de Vivienda y Suelo* (EMVS, the head of housing policies of the Madrid City Council), the student residence in Vallecas (Campus for Living Cities), or the Butarque library.

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

[3] https://www.madrid.es/UnidadesDescentralizadas/Sostenibilidad/EspeInf/Adaptación%20climática/ficheros/ClimateAdaptationActionPlanCityofMadridDigV.pdf

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 decarbonization of its systems.

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.

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 an express letter.

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, 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.

Work process

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.
- 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. 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, as well as of the City of Madrid's Climate Adaptation Actions that complement the Roadmap.

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, Madrid has participated in the project 'Multi-stakeholder innovative & systemic solutions for urban regeneration: Spain' (Urbanew) 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.

Currently, and continuing this project, Madrid is participating in EMC3: Enabling Massive Change for Climate-Neutral Cities to facilitate the deployment of local-scale strategies that enable the massive energy renovation and rehabilitation of the built environment in Spain, along with five other Spanish cities.

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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. Over 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.

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.

MADRID

PART A - CURRENT STATE OF CLIMATE ACTION

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

MODULE A-1

Greenhouse Gas Emissions Baseline Inventory

Module A-1 "Greenhouse Gas Emissions Baseline Inventory" details and describes the latest GHG inventory, that is taken as a starting point, referring to a clearly stated geographic boundary which in this case is the municipality of Madrid. The aim of this section is to establish the emission baseline and to establish the emissions gap to 2030 climate neutrality according to the inventory specifications defined in the Cities Mission's Info Kit for Cities[4] and the process outlined in the CCC Action Plan Guidance and Explanations.

It includes:

- *Definition of geographic boundary of the GHG inventory and, if applicable, excluded areas, sectors, scopes, sources, gases.*
- *An explanation of any (current) mismatch between the boundary of the GHG inventory and the climate-neutrality target, including actions planned to address the mismatch.*
- *Key data and visualization of the latest GHG inventory (ideally not older than 2018), according to the coverage (source sectors, scopes, and gases) specified in the Mission's "Info Kit for Cities" to establish the emission baseline. If additional inventories are used in the CNAP, the same information should be provided for all inventories.*
- *Descriptive assessment of current GHG inventory, including a description of the current state of each emitting sector.*
- *Where a BAU scenario is used as baseline, a description of methodology and assumptions (for instance, which sectors/sources/gases are actually modelled; locally specific input variables vs. national or default data, etc.).*

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

[4] European Commission, 2021, *Info Kit for Cities*, European Commission. Further guidance is available also in: NZC, 2023, *Guidance on target setting and emissions inventories for the Climate-neutral and Smart Cities Mission*, NetZeroCities https://netzerocities.app/resource-3814

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 decarbonization strategies and actions. This scenario represents a projection of what the city's emissions trajectory would look like if no additional decarbonization 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 decarbonization strategies and actions. By comparing the costs and benefits of different decarbonization 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.

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	
Base year	2022 (final energy consumption data according to the energy balance of the Municipality of Madrid, 2024 update)
Unit	MWh/año
sector	**Total**
Buildings and Services (including fuel consumption in agricultural/livestock station facilities)	**18.555.523**
Biomass	103.767
Natural gas	6.674.167
Petroleum products	1.600.551
Electricity	9.929.805
Renewables (Solar thermal and geothermal)	247.232
Industry (energy consumption in the industrial sector, both from combustion processes and electrical energy)	**2.309.062**
Natural gas	1.690.484
Petroleum products	51.807
Electricity	566.771
Road transport	**10.132.880**
Natural gas	824.288
Petroleum products	8.977.506
Biofuels	315.210
Electricity	15.876
Other modes of transport (includes mobile machinery from the agriculture and livestock sector)	**3.875.921**
Petroleum products	2.764.176
Electricity	1.111.745
Waste treatment	**73.613**

Petroleum products	2.750
Electricity	70.863
Wastewater treatment	**206.528**
Natural gas	91.827
Electricity	114.701
Agriculture, forestry and land use	Energy consumption of fixed installations is included in “Buildings and Services”. Energy consumption by machinery is included in “Other modes of transport”

A-1.2: Emission factors applied

Emission factors from the emissions inventory of the Madrid City Council, year 2022. 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.

Primary energy / energy source	Carbon dioxide (CO_2)	Methane (CH_4)	Nitrous oxide (N_2O)	Hydrofluorocarbons and Perfluorocarbons	Sulphur hexafluoride (SF_6)	Nitrogen trifluoride (NF_3)
Electricity (t/MWh)	1,67E-01	6,36E-06	6,93E-06			
Electricity (losses, t/MWh)	3,88E-02	1,48E-06	1,61E-06			
Buildings and services (including combustion in fixed/stationary installations in agriculture and livestock)						
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 (wood, 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 CO2eq /km characteristic by vehicle sector)						
Cars	1,37E-04					
Buses	7,51E-04					
Light vehicles	1,90E-04					
Heavy vehicles	4,69E-04					
Other modes of transport (including mobile machinery from the agriculture and livestock sector)						
Other (diesel shunting locomotives)	3,19E+00	1,76E-04	2,40E-05			
Other (diesel motor cars)	3,14E+00	1,79E-04	2,40E-05			
Other (diesel freight locomotives)	3,14E+00	1,82E-04	2,40E-05			
Kerosene for jet engines (aviation)	7,06E-05	1,00E-04	1,00E-04			
Other (diesel for agricultural machinery)	3,16E+00	4,44E-05	1,38E-04			
Other (diesel for industrial machinery)	3,16E+00	4,80E-05	1,36E-04			
Other (diesel for composting machinery)	3,16E+00	4,80E-05	1,36E-04			
Other (diesel for gardening engines)	3,16E+00	5,50E-05	1,35E-04			

Gasoline for motors	3,20E+00	2,20E-03	1,70E-05			
Waste and wastewater treatment						
Diesel (t/GJ)	7,30E-02	1,70E-06	1,50E-06			
Municipal waste (all, t/t)	6,27E-01	1,00E-06	1,00E-04			
Natural gas (landfill, t/GJ)	5,60E-02	3,16E-06	1,30E-06			
Other biogas (landfill-antorcha, t/t CH_4 flared)	0,00E+00	8,00E-06	9,00E-05			
Other biogas (landfill-engine, t/t CH_4 flared)	0,00E+00	2,80E-02	9,00E-05			
Other biogas (anaerobic digestion-antorcha, t/t CH_4 flared)	0,00E+00	8,00E-03	9,00E-05			
Other biogas (anaerobic digestion-engine, t/t CH_4 flared)	0,00E+00	2,80E-02	9,00E-05			
Natural gas (sludge drying-turbine, t/GJ)	5,60E-02	4,00E-02	1,30E-06			
Natural gas (sludge drying-engine, t/GJ)	5,60E-02	3,16E-04	1,30E-06			
Anaerobic digestion (t/kt)	0,00E+00	1,00E-06	0,00E-06			
Incineration (t/body)	3,90E-02	8,00E-08	0,00E-06			
Composting (t/kt)	0,00E+00	4,00E-06	3,00E-07			
Agriculture, forestry and land use (non-energy related emissions)						
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			

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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)	-	1,57E-03	-			
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	-	-	5,00E-06			

(other systems, t/t N excreted)						
Forest fires (t/Ha)	3,60E+00	5,40E-02	1,60E-03			
Aquatic spaces (t/Ha)	-	5,00E-02	-			
Animals (t/individual*year)	-	1,00E-04	-			
Others						
Gas distribution networks (t/Gt)	8,84E-04	2,24E-05	-			

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A-1.3: Activities by sector of origin			
Base year		2022	
	Scope 1	**Scope 2**	**Scope 3**
Buildings and services (combustion processes. Includes combustion in fixed/stationary installations in agriculture and livestock)	Emissions from stationary combustion in boilers, turbines, engines and similar installations	Emissions associated with electricity generation processes whose consumption takes place in the municipality of Madrid.	Emissions associated with losses in the transport of electricity from the points of generation to the points of final consumption.
Industry (energy processes)	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.	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.	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			
Motorbikes			
Evaporation of petrol from vehicles			
Tyre and brake wear			
Pavement abrasion			
Other modes of transport (includes mobile machinery from the agriculture and livestock sector)	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.	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 machinery			
Gardening machinery			
Other			
Waste and wastewater treatment			

Waste incineration	Emissions from the various waste management operations	Emissions associated with electricity generation processes whose consumption takes place in the municipality of Madrid.	Emissions associated with losses in the transport of electricity from the points of generation to the points of final consumption.
Landfill			
Cremation			
Other waste treatment			
Industrial processes without combustion (and not associated with any energy consumption) and product use	Emissions from non-combustion industrial and from production and consumption processes involving the use of organic solvents, HFCs, PFCs, SF_6 or N_2 O.	-	-
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			
Use of HFCs, PFCs, SF_6 and N_2O			
Agriculture, forestry and land use (emissions not associated with energy processes)	Emissions from the development of agricultural and animal husbandry practices, as well as from the management and exploitation of forests and natural areas. It does not include emissions from energy consumption	-	-
Fertilizer crops			
Fertilizer-free crops			
Open field burning of stubble, straw...			
Livestock (enteric fermentation)			

Manure management with reference to organic compounds	in the sector: neither mobile machinery (which is included in other modes of transport), nor fixed/stationary installations (which are included in buildings and services)		
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			

A-1.4: GHG emissions by sector of origin

Base year		2022			
Unit		t CO_2 equivalent/year			
		Scope 1	**Scope 2**	**Scope 3**	**Total**
Buildings and Services (combustion processes, including fuel consumption in agricultural/livestock station facilities)		1.790.169	1.659.663	385.034	**3.834.865**
Industry (energy processes)		442.979	92.331	21.420	**556.730**
Road transport		1.924.436	2.655	616	**1.927.707**
Other modes of transport (includes mobile machinery from the agriculture and livestock sector)		702.847	185.915	43.131	**931.894**
Industrial processes without combustion (and not associated with any energy consumption) and product use		349.519	-	-	**349.519**
Waste and wastewater treatment		665.742	5.800	1.346	**672.887**
Agriculture, forestry and land use	Sources (positive emissions)	13.488	-	-	**13.488**
	Sinks (negative emissions)	-39.598	-	-	**-39.598**
Other (emissions associated with the extraction and distribution of fossil fuels)		19.233	-	-	**19.233**

Total (without absorption)	**5.908.412**	**1.946.364**	**451.547**	**8.306.323**
Total (with absorptions)	**5.868.814**	**1.946.364**	**451.547**	**8.266.725**

A-1.5: Gráficos y tablas

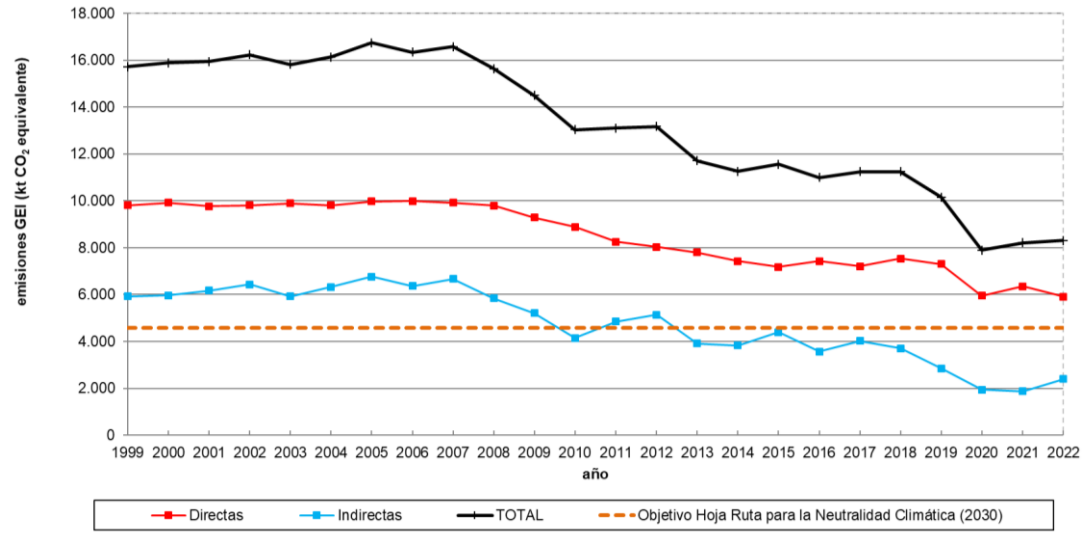

Figure 1. Evolution of direct, indirect and total emissions.

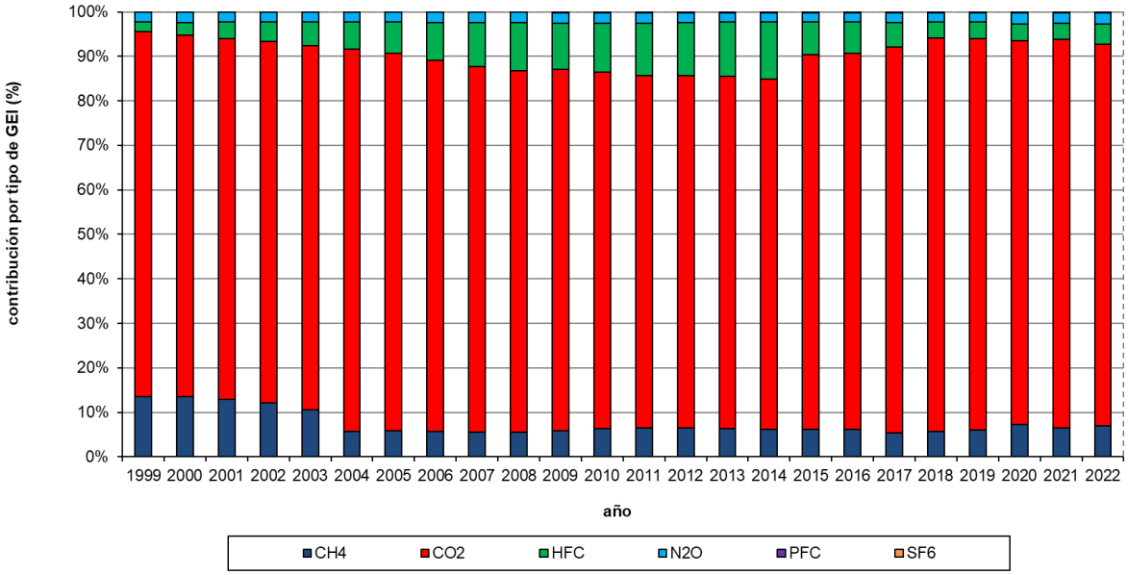

Figure 2. Evolution of the contribution of each GHG to direct emissions

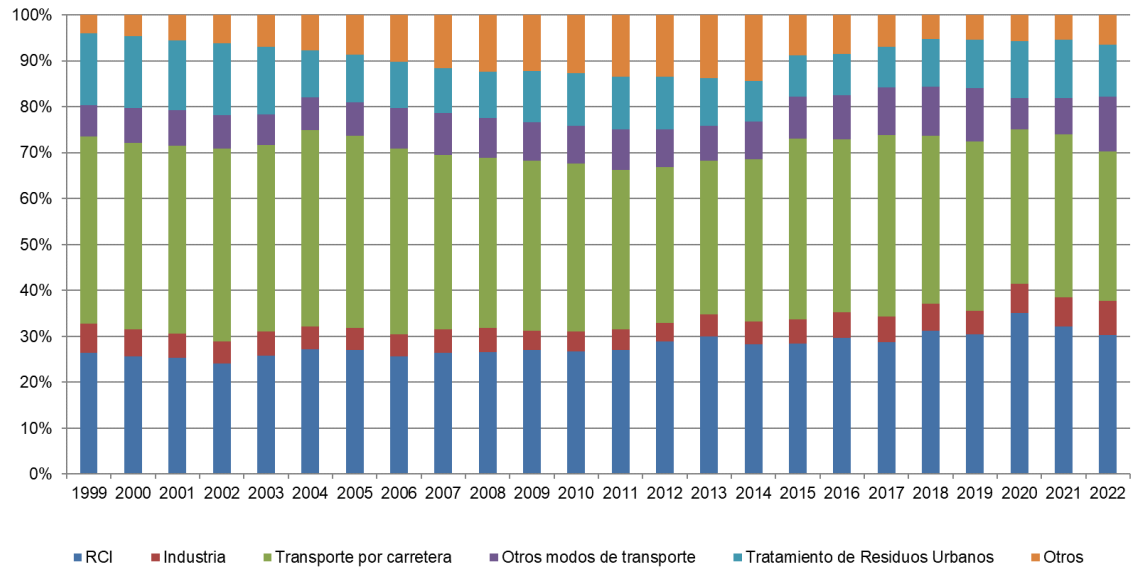

Figure 3. Evolution of each sector's contribution to direct GHG emissions. Notes: RCI = buildings and services; Industry = industry (energy processes) + non-combustion industrial processes. Other = product use + agriculture, forestry, and land use + fossil fuel extraction and distribution

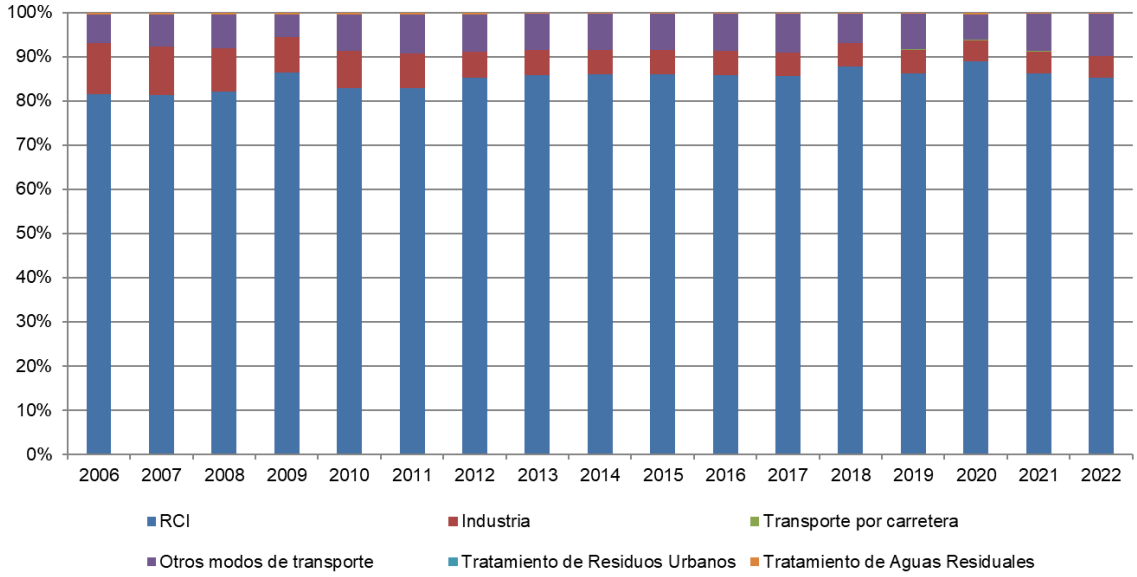

Figure 4. Evolution of each sector's contribution to indirect GHG emissions. Notes: RCI = buildings and services; Industry = industry (energy processes) + non-combustion industrial processes. Other = product use + agriculture, forestry, and land use + fossil fuel extraction and distribution

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

Figure 1 illustrates the evolution of total GHG emissions, both direct (Scope 1) and indirect (Scope 2 + Scope 3), over the period 1999–2022. The figure also shows the emissions level set as a Target of the Roadmap to Climate Neutrality (65% emissions reduction compared to 1990 levels). Despite the 47% reduction in total emissions compared to 1999, emission levels in 2022 still exceed the 2030 target by 82%, so further progress is needed.
The evolution of the contribution of each GHG to direct emissions is shown in **Figure 2**. Carbon dioxide is the GHG with the highest contribution, with an average contribution of 83% over the period 1999-2022. Methane has

decreased by almost 50% compared to its contribution in 1999. The contribution of hydrofluorocarbons has reached close to 5% of emissions in 2022.

Figures 3 and 4 detail direct and indirect emissions (associated with electricity consumption), broken down by sector. The contribution of road transport to direct emissions decreased by 20% compared to 1999, while that of other transport modes increased by 72%, driven by the greater prevalence of air transport in the last decade. Regarding indirect emissions, the RCI sector has remained the main contributor, with a contribution fluctuating between 80 and 90% of the total.

All figures in Module A-1.5 described have been extracted from the calculations of the GHG Emissions Inventory of the City of Madrid, in its 2022 edition, and exclude absorptions by sinks.

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

A-1.4: GHG emissions by sector of origin [data source: Economic Case]					
Base year	2022				
Unit	ktCO2e /year				
	Scope 1	**Scope 2**	**Scope 3**	**Total**	**% TT**
Transport	2.088			2.088	24,8%
Buildings and Heating and Cooling	2.273			2.273	27,0%
Electricity		2.203		2.203	26,2%
Waste			458	458	5,4%
Other	1.401			1.401	16,6%
Total	5.762	2.203	458	8.423	100,0%

In addition, more comprehensive information can be found on NetZero Planner / NetZeroCities: Madrid 2030 platform about,

- A-1.2: Emission Factors applied;
- A-1.3: Activities by sector of origin;
- A-1.4: GHG emissions by sector of origin (BAU 2030).

MODULE A-2

Current Policies and Strategies Assessment

Module A-2 "Current Policies and Strategies" lists and assesses existing policies, strategies, initiatives, or regulation from local, regional, and national level, relevant to the city's climate neutrality transition. This assessment contributes to identifying the gap (if any) between the emissions reduction due to existing initiatives and the city´s 2030 climate neutrality target. Filling this gap by identifying additional actions and levers to achieve the city´s emission reduction target is the focus of this Action Plan. The assessment of current policies and strategies offers hence a starting point for exploring the impact pathways (See Part C).

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	It involves driving forward the process of	

			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.	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); - Actions in mobility (such as low-emission zones); - Innovations in administration and governance (such as updating local regulations).	As mentioned, this is the strategy that encompasses the processes aimed at reducing the Madrid polluting emissions, transforming it into a sustainable city.	Measures to promote the transition to efficient air conditioning systems, fleet renewal, the promotion of public transport, the integration of all modes of transport, the reinforcement of road safety and innovation.
Strategy	Local	Urban strategy "Sueña Madrid" (en elaboración)	An initiative by Madrid City Council that promotes the drafting of a new Municipal Strategic Plan through citizen participation, to provide the city with flexible and adaptive urban planning tools that will allow it to meet future challenges without hindering current progress or compromising legal security.	The Strategic Plan of the City of Madrid defines the basic elements for the organization and structure of the municipality, its strategic objectives, and the framework for all other urban planning instruments. It aims to propose adaptive rather than predictive urban planning.	Based on the data-driven city diagnosis, it is necessary to determine indicators based on the nine proposed city challenges. These will lead to concrete strategies whose fundamental objective will be to rebalance the city in all its territorial, social, economic, and environmental aspects.
Technical document	Local	Roadmap to climate neutrality for the city of Madrid 2050	Technical document identifying and prioritising climate action measures with the most significant reduction potential. 2024 Update	Aligns municipal policies with European and state policies	

Technical document	Local	Climate Adaptation Action Plan - City of Madrid	It presents the objectives for climate adaptation, outlining the goals to be developed for each of them and the guidelines to follow for their achievement. 2025	It outlines and communicates the specific lines of work to be followed within the general framework of adaptation	8 general objectives, with 20 goals for their development
Plan	Local	Plan de Fomento y Gestión de la Biodiversidad (*Biodiversity promotion and management plan*)	Lead the implementation of actions capable of reversing biodiversity loss in the city 2023	Contextualizes and aligns the actions to be undertaken in terms of biodiversity	
Municipal regulations (Ordinance)	Local	Ordenanza de Calidad del Aire y Sostenibilidad (OCAS; Air quality and sustainability ordinance)	2021		
Municipal regulations (Ordinance)	Local	Ordenanza de Movilidad Sostenible (Sustainable mobility ordinance)	2023 Update		
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.	It is part of the European Mission for 100 Climate-Neutral and Smart Cities	
Plan	National	PNACC 2021-2030	The Spanish National Climate Change Adaptation Plan is a national planning instrument for coordinated action against climate change		It establishes 81 lines of action through 18 areas of work
Strategy	National	Spanish Urban Agenda	Strategic document for sustainability in urban development policies	It presents a working method and a process for all actors, public and private	
Strategy	National	Long-Term Decarbonisation	It shows a decarbonisation	Imposes obligations on	

		Strategy 2050 (ELP 2050)	pathway that will guide investments in the coming years, underpinning the shift to an emission-free economy	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 NextGenerationEU 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 projects, with a direct investment of 3.9 billion euros, aimed at promoting the ecological transition, digital transformation and social cohesion.
Plan	Local	Regenera Madrid Plan	Plan to comprehensively intervene in the city's degraded residential areas with the aim of improving the design of public spaces to promote coexistence and quality of life for citizens	The Plan will address areas built before 1985, covering more than **85 square kilometers**, including more than **1.2 million homes**, and will directly affect nearly 2.6 million residents, or 75% of Madrid's population	An urban regeneration plan that includes interventions in **inter-block spaces** (residential areas that represent more than a third of Madrid's residential land). They will undergo a comprehensive transformation to improve their functionality and aesthetics, promoting social cohesion and coexistence.

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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 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. As a complement to the Roadmap, in May 2025, Madrid published "Climate Adaptation Action Plan - City of Madrid" which sets out the objectives and specific actions the city must develop regarding climate change adaptation. These are eight objectives—cooling the city, protecting and increasing urban biodiversity, optimizing water resource management, adapting municipal services and facilities, implementing governance for climate adaptation, promoting climate adaptation from a social, fair, and inclusive perspective, and assessing climate risk: monitoring and control—that seek to increase Madrid's resilience to the adverse effects of climate change. Furthermore, in June 2025, the Área de Gobierno de Políticas de Vivienda de Madrid (head of housing policies of the Madrid City Council) approved the Regenera Madrid Plan, which will transform public spaces by creating more inclusive, accessible, and green neighborhoods thanks to the definition of a Healthy Neighborhood model tailored to each space. 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. This strategic document, which follows up on the 'Plan Azul+' document, establishes the main long-term lines of action for mitigating and adapting to adverse weather events that may arise in the region. It also includes guidelines for adequately addressing the challenges associated with decarbonization and improving air quality.

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 Mt CO2eq (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 Mt CO2eq. This 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'[5].

A-2.3: Emissions Gap								
Scope 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)*** *(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 Climatization	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 those 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.

[5] 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.

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 manage to channel 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								
Scope 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)*** *(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 Climatization	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 to develop this ambition will be carried out within the framework of the mission and its evolution will be informed in the following iterations of this CCC.

MODULE A-3

Systemic Barriers and Opportunities to 2030 Climate Neutrality

The mapping results of the ecosystem of the climate action stakeholders are developed here as well as 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.*

A-3.1: Description of systemic barriers and opportunities
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.

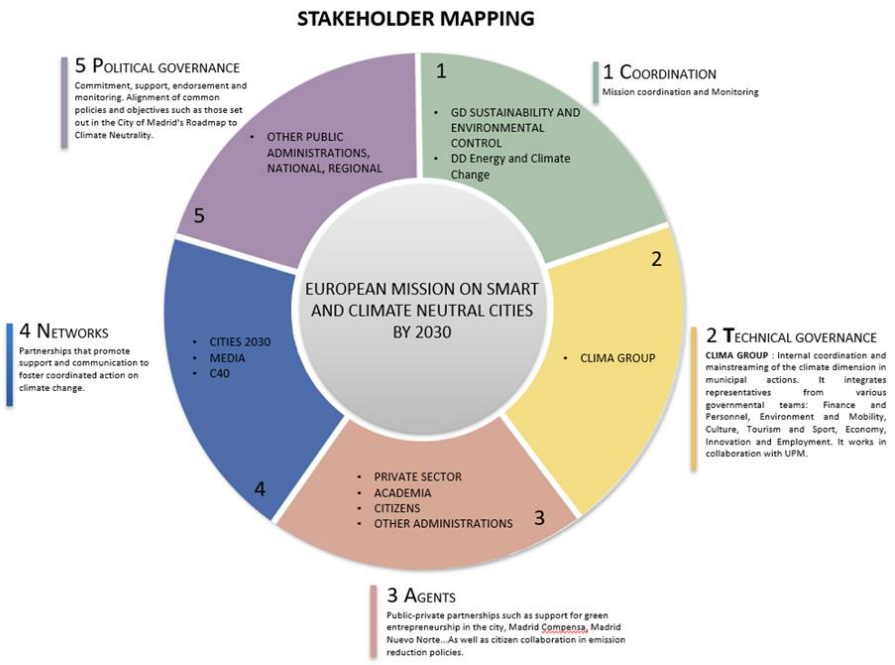
With regard to municipal management, the current centralized model is a barrier, where the processes of planning, design, execution and maintenance are not adequately coordinated, nor are they implemented in a transversal manner in the organization. The inertia of working in silos and the compartmentalized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

However, the main challenges to achieve climatic neutrality are of a social nature, and include access to technologies that require important investments, changes in habits and consumption, the need for new work profiles for green jobs, etc. This observation shows that, beyond moral considerations, guaranteeing an equitable transition is essential for the effectiveness of climate change mitigation policies. Otherwise, the inequalities will be in themselves the main barriers that can obstruct the compliance with climate neutrality objectives.

A-3.2 Mapeo de sistemas y partes interesadas				
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 - SMEs and the self-employed - Cooperatives - Start-up ecosystem - Banks and financial institutions	- Mission Working Group - Multi-actor platform - Business networks	Attracting investment and aligning with neutrality objectives	Economic growth opportunity

	- Ambassador organisations - Subscribing entities			
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 stablishments	- 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-3.3: Description or visualisation of the city's participatory model for climate neutrality



PART B - PATHWAYS TOWARDS CLIMATE NEUTRALITY BY 2030

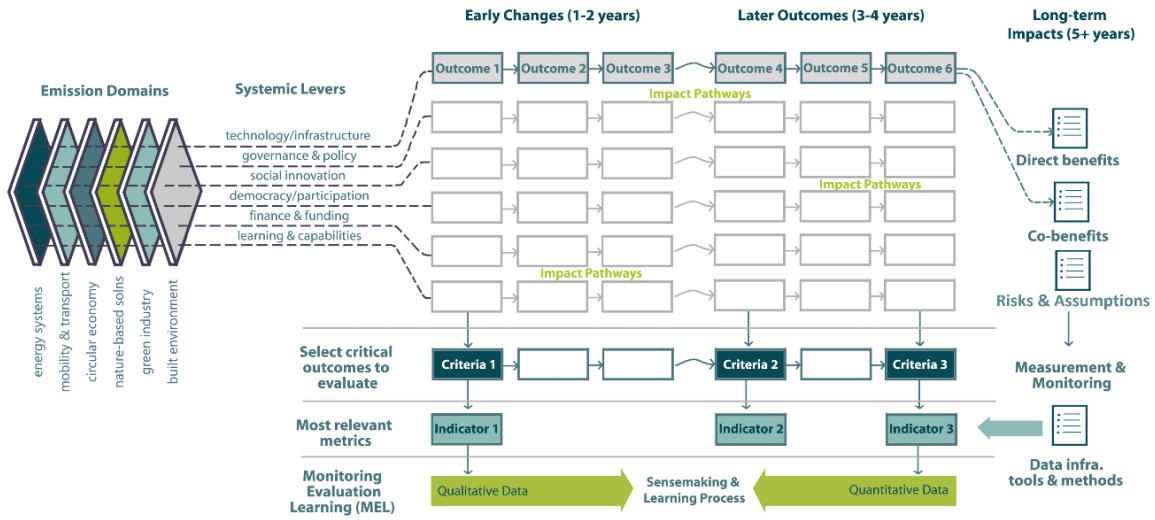
This module represents the core of the Climate Neutral Action Plan 2030, consisting of the essential elements: scenarios, strategic objectives, impacts, portfolios of actions and indicators for monitoring, evaluation and learning.

MODULE B-1

Climate Neutrality Scenarios and Impact Pathways

Impact pathways, short- and long-term outcomes, and direct and indirect impacts (co-benefits) are indicated below.

The methodological recommendations '2030 Climate Neutrality Action Plan - Guidance and Explanations V2.1' develop the impact paths in accordance with the matrix structure Emission domains / Systemic levers as shown below:



As a cross reference, it is schematized in the table shown below the relationship from this perspective of Emission Domains with the results of the Economic Model, identifying the key indicators for their follow-up, from one and another perspective.

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SECTOR OF ORIGIN	SUBSECTOR	INDICATORS						REDUCTION (by 2030, kt CO2e)
TRANSPORT	*REDUCED MOTORIZED PASSENGER TRANSPORTATION NEED*		*3.1.1; 3.1.2*					***215***
	SHIFT TO PUBLIC & NON-MOTORIZED TRANSPORT		*3.2.1; 3.2.2*					***39***
	INCREASED CARPOOLING		*3.2.5*					***99***
	ELECTRIFICATION OF CARS + MOTORCYCLES		*3.3.1; 3.3.2*					***182***
	ELECTRIFICATION OF BUSES		*3.3.3*					***62***
	OPTIMIZED LOGISTICS		*0.0.2; 1.3.1*					***133***
	ELECTRIFICATION OF TRUCKS		*3.3.4*					***59***
BUILDINGS & HEATING	*BUILDING RENOVATIONS (ENVELOPE)*						*2.1.1; 2.1.2*	***60***
	NEW ENERGY-EFFICIENT BUILDINGS						*1.2.1; 1.4.1*	***23***
	DECARBONIZING HEATING GENERATION						*2.2.1; 2.2.3; 4.2.1*	***1.002***
ELECTRICITY	*EFFICIENT LIGHTING & APPLIANCES*						*0.0.1; 4.2.4*	***247***
	DECARBONIZING ELECTRICITY GENERATION	*1.7.1; 1.7.2*						***2.640***
WASTE	*INCREASED WASTE RECYCLING IN RCI SECTOR*			*5.2.1; 5.3.1*				***90***
		2.640	***789***	***90***			***1.332***	***4.851***
		ENERGY SYSTEMS	*MOBILITY & TRANSPORT*	*WASTE / CIRCULAR ECONOMY*	*GREEN INFRASTRUCTURE & NbS*	*SOCIAL DIMENSION*	*PUBLIC SPACE & BUILT ENVIRONMENT*	

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B-1.1: Impact pathways					
Emission Domain	**Systemic levers**	**Early changes (1-2 years)**	**Late outcomes (3-4 years)**	**Direct impacts (emission reductions)**	**Indirect impacts (co-benefits)**
Energy systems	Technology and infrastructure	- Increase in the level of electrification of energy consumption in the residential sector, services and on road transport.	- Reinforcement of the capacity of the distribution electricity network.	- Reduction due to the increase in electrification of energy demand.	- Greater relevance of the economy of low emissions.
	Social innovation	- Introduction of consensus and communication of experiences in the process of development of pilot projects in renewable energy.	- Promotion of multi-actor experiences in the social body; - Familiarization of citizenship with the administrative mechanisms of new energy models.	- Reduction of carbon footprint by generalization of local clean energy generation; - Increase in PV generation.	- Greater culture of collective involvement in local initiatives.
	Democracy / Participation	- Analysis of level and ways of citizen participation in the process of developing local energy initiatives.	- Lessons learned: involvement of a growing part of the social fabric in the feasibility, construction and continuous improvement of renewable projects; - MAnnual of best involvement practices.	- Reduction in the consumption of the general energy network; - Reduction of energy poverty.	- Co -participatory processes potentially extensible to other areas. Management is democratized.
	Finance / Funding	- Clean energy generation with direct economic return for the citizens involved.	- Great increase in the number and volume of accessions to the new models.	- Greater financial returns to small managers (citizenship) due to scale.	- Greater democratization in investment in clean energy; - Impulse to local employment.
	Learning and capabilities	- Promotion of entrepreneurship from new energy models.	- Citizen involvement in the development of new initiatives. - Promotion of more flexible and adaptable regulations.	- Streamline the process of introducing urban renewable generation, increasing production.	- Assimilation of best practices for the introduction and implementation of local clean energy.

Mobility & transport	Technology and infrastructure	- Increase in the number of unique users of the public bicycle-sharing service (BiciMAD).	- Increase in the number of public bike stations.	- Promoting clean mobility through various mechanisms, that lead to emissions reduction.	- Healthier habits; - Improving pedestrian quality and reducing traffic congestion; - Mitigating noise pollution and thermal radiation in the city; - Familiarization with mobility alternatives at all educational levels.
		- Introduction of the "pedestrian and public space" approach to cycling infrastructure in educational settings.	- Scaling of the model under a new approach and extension to other environments.		
		- Increase in the rapid charging network for the municipal fleet of electric vehicles.	- High-speed, nearby access to municipal rapid charging points for citizens; - Complete electrification of EMT bus lines; - Increased service quality (charging speed, availability, etc.) and expansion of the municipal fleet's charging network.		
	Governance and Policy	- Review of the regulatory framework on mobility (New OMS); - Regulations for the Regulated Parking Service (SER) facilitating Zero Emission Vehicles.	- Full implementation of the Low Emission Zone (called ZBE, ZBEDEP) regulatory framework to improve environmental protection for the entire city.	- The use of emission sources is discouraged by regulation, with its corresponding decarbonization effect.	- Citizen perception of progress and consistency between medium-term climate initiatives and the strength of their regulatory support.
	Social innovation	- Spaces for a gradual transformation of city mobility, acting as 'urban nodes' for multiple services (Mobility Hubs).	- Achieve a high degree of modal shift for first- and last-mile connectivity.	- These 'Multimodal Passenger Centers' aim to be a viable alternative to private cars and strengthen public transportation.	- Maximizing access to mobility and other resources.

		- Consolidation of telecommuting and hybrid work schemes whenever this modality is viable.	- Analysis and implementation of alternative hybrid formulas with productivity gains.	- Reduction in the number of trips.	- Time savings and improved overall working conditions; - Facilitates work-life balance.
	Finance / Funding	- Continuation of financing lines to promote sustainable mobility.	- Promoting all forms of sustainable mobility technology.	- Systematic and accelerated reduction of all types of emission sources associated with transportation.	- Strengthening Environmental Justice.
	Learning and capabilities	- Critical and open analysis (social networks) on the different initiatives, particularly during the first steps of their development.	- Development of participatory and specific methodologies in this area; - Lessons learned from all implemented projects, aimed at their replicability.	- Greater agility in the development and implementation of replicable climate actions.	- Open transfer of expert knowledge acquired in innovative climate actions.
Waste & circular economy	Technology and infrastructure	- Analysis of last-mile logistics for products to be delivered to municipal services.	- Analysis of ways to introduce circular economy criteria into municipal contracts.	- Reduction of logistics routes, packaging, waste, etc.	- Promoting a more sustainable culture of repair and reuse.
	Governance and Policy	- Discussion forum at the municipal level for the drafting of a municipal circular economy strategy.	- Integration of circular economy criteria into the management of various municipal services.	- Reduction of production inputs, with their corresponding carbon footprint, particularly energy inputs.	- Promoting entrepreneurship around against planned obsolescence among manufacturers; - Greater respect for natural resources and biodiversity.
	Learning and capabilities	- Import well-tested separation and utilization techniques, assessing their impact on the sector.	- Minimization of construction waste through gradual acquisition of skills in a green employment context.	- Reduction of emissions linked to production and transport (embedded carbon).	
Green infrastructure & nature-	Technology and infrastructure	- Promotion of facades and other vertical	- Extend vertical greening initiatives to areas with high	- CO2 reduction benefits linked to the greening	- Greater hygrothermal balance; reduction

based solutions		landscaped elements.	urban density and heat islands.	of public spaces.	of heat island effects; - Greater visual comfort; more walkable spaces; - Better citizen health; - Promotion of biodiversity.
	Learning and capabilities	- Collection of technical information on plant species specifically incorporated into walls and other vertical surfaces in environments with hygro-thermal stress in Madrid.	- Development of a catalogue of the most suitable species for each environment.	- Improve the conditions for successful plantations, with their associated ecosystem benefits.	- Advances in plantation monitoring; - Reduction of reflected noise.
Social dimension	Democracy / Participation	- Proximity information for citizens on the associated economic, social, and health benefits.	- Analysis of citizens' perspectives on environmental strategies and measures.	- Better acceptance of the measures adopted and their scaling up.	- Gathering latent ideas and initiatives from citizens through local contact.
Public space / Built environment	Technology and infrastructure	- Promoting electric thermal systems in public buildings (high-rating heat pumps).	- Promote the use of other thermal machines free of maladaptation (geothermal energy in particular) hybridized with PV input as demonstration projects.	- Avoid emissions by increasing thermal electrification and gaining thermal and lighting efficiency.	- Prevention of climate maladaptation; - Promotion of clean technology entrepreneurship; - Improved comfort/cost ratio.
		- Encourage energy efficiency in both individual and collective uses.	- Replace inefficient lighting systems in buildings and municipal centers.		
		- Adaptation and improvement of Integrated Energy Management Systems (for usage optimization).	- Generalization of Energy Management Systems.	- Reduction of energy inputs and its corresponding reduction in emissions.	- More responsible habits in the use of collective resources; - Promotion of the development of technological systems through public-private collaboration.

	Social innovation	- Raise environmental awareness when holding public events with environmental impact.	- Analyze new ways to facilitate social awareness about the importance of air quality and sustainability.	- The Air Quality and Sustainability Ordinance (OCAS) makes it mandatory to adopt measures to reduce the carbon footprint when holding large events.	- Improving the quality and regulation of civic celebrations.
		- Creation of working groups involving municipal technicians, COAM, citizen organizations, and others on energy rehabilitation.	- Launch of pilot projects for all viable initiatives.	- Better thermal insulation, etc. with its corresponding reduction in energy consumption.	- Improved comfort/energy bill ratio; - Improved sound insulation; - Helps combat energy poverty; - Higher-value buildings.
	Democracy / Participation	- Involvement of citizens and organizations linked to the design of urban green infrastructure.	- Consolidation of co-creation methods and methods aimed at the built environment of their surroundings.	- Replicability of good environmental practices.	- Better public perception of their role in decision-making.
	Finance / Funding	- Financing lines for energy rehabilitation.	- Analyze new ways of introducing technologies and experimental forms of collective rehabilitation (sustainable roofs, cool rooftops, etc.).	- Improvements in building envelopes and the efficiency of their thermal equipment.	- Investment in continuous improvement and updating of the built environment is encouraged.

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.

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- 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.
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

The project portfolio approach enables the **articulation of multiple initiatives under a shared vision for climate transformation**, fostering synergies, cross-learning, and greater systemic impact. Instead of promoting isolated actions, portfolios bring together complementary projects that address different aspects of the ecological transition. These portfolios are implemented and tested within experimentation areas, which function as real-life urban laboratories.

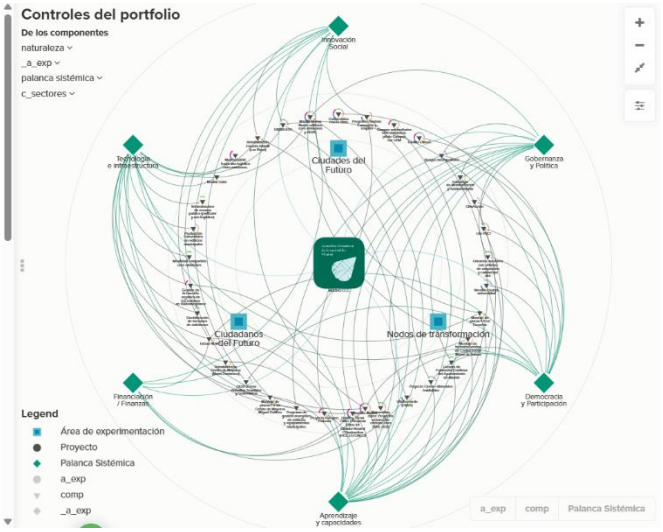
As outlined in the *Work Process* section of Madrid's Climate Agreement, the strategy is structured around three experimentation areas:

- **New climate-neutral city developments**
- **A new culture for the citizens of the future**
- **Nodes of neutrality.**

These areas serve as strategic frameworks to activate, test, and evaluate urban transformation processes aimed at achieving climate neutrality. Rather than being closed interventions, they are dynamic innovation spaces where pilot projects are designed and deployed to generate actionable and scalable learnings for the entire city. Each experimentation area provides a specific setting in which sustainable solutions — technological, social, and public policy-based — are explored under real-world conditions. Through collaborative methodologies and multi-stakeholder co-design processes, public administrations, citizens, academia, businesses, and civil society can engage in creative and iterative experimentation in a data-informed manner. These experiences offer valuable insights into the feasibility, impact, and replicability potential of the implemented solutions.

The role of the Madrid City Council is essential in defining the scope and boundaries of these areas, not through a hierarchical lens, but as facilitators of listening, contextual analysis, and cooperation. The experimentation areas of this Agreement are thus conceived as living infrastructures for the climate transition, where qualitative observations are combined with impact measurements to ultimately accelerate systemic change toward a more resilient, equitable, and sustainable city.

With the support of itdUPM (*Centro de Innovación en Tecnología para el Desarrollo Humano*) from Universidad Politécnica de Madrid, we have developed a digital tool for designing and managing Madrid's Climate City Contract project portfolio.

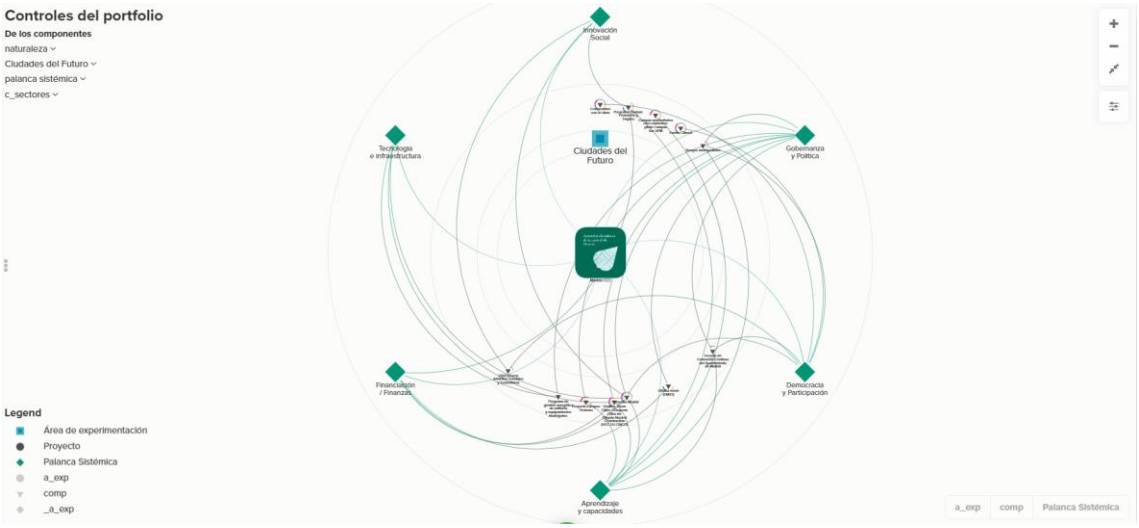


>>> **Link to the digital tool:** https://kumu.io/malmestar08/ccc-portfolio-madrid-2025#untitled-map
The analysis of the different areas of experimentation of Madrid's Climate City Contract is detailed below:

New climate-neutral city developments

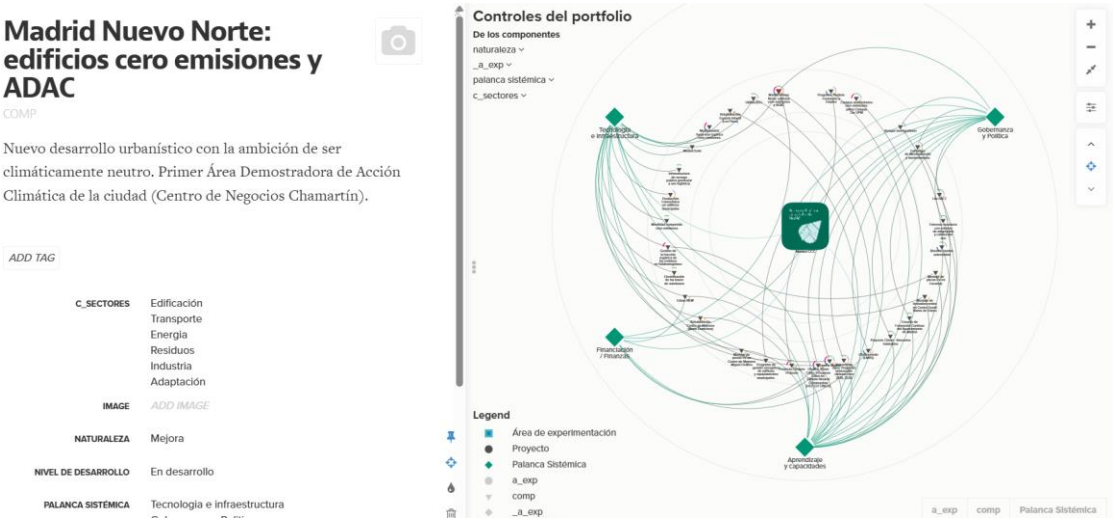
This experimental area represents a strategic vision of **urban planning as a tool for ecological, economic, and cultural transformation**. Within this framework, the territory is conceived as a living system that must regenerate from the roots up, reconfiguring the ways we live, produce, and interact in the city.

- **Identification and quantitative analysis:** The "**Cities of the Future**" area brings together a diverse set of initiatives that, although heterogeneous, share a common focus on transformative urban planning. Filtering the database, 14 projects were identified that are explicitly linked to this area of experimentation. The visualisation of this project portfolio is defined in the following graph.



+ **Driving projects:** The driving projects in this area are,

  - **"Crea Madrid Nuevo Norte"** is a large-scale laboratory for imagining and building a new model for a climate-neutral and resilient city. Covering an area of 3.3 km², this development is not just a real estate transaction, but an infrastructure that integrates nature-based solutions, clean technologies, and collaborative governance formulas from the outset. It is, at the same time, an economic catalyst, a test bed for innovation, and a learning matrix that can be replicated in other urban hubs.



- **"Visible C40"** VISIBLE is a two-year project led by C40 in London, Madrid, and Oslo to decarbonize the built environment in an inclusive and economically viable way. It brings together local governments, unions, industry, finance, and residents to design new business models, promote pilot projects, and ensure that the transition incorporates social equity and labor rights. Given that buildings generate 40% of global emissions, VISIBLE seeks to transform urban construction and renovation into a fairer, more resilient, and low-carbon sector.

In addition to Crea Madrid Nuevo Norte and Visible C40, other projects that are part of this experimental area include Sueña Madrid, the European PROBONO project, HCC EU CINCO: Training and Employment. For more details, see MODULE B-2: Climate Neutrality Portfolio Design.

+ **Decarbonization sectors:** Projects in the experimentation area "**New climate-neutral city developments**" address a combination of key sectors for urban climate neutrality. In total, seven sectors are identified: buildings, transport, energy, waste, industry, and climate change

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adaptation. Among them, the energy sector is mentioned in at least six projects, often in conjunction with buildings and industry, underscoring the centrality of the energy transition in the future urban model. The buildings sector is present in five projects, in most cases as part of integrated proposals that also include waste, transport, and energy. Climate adaptation appears as a primary sector in three projects, highlighting its role in redesigning more resilient urban spaces. Transport, waste, and industry are present across all sectors, demonstrating a systemic approach. Notably, five projects simultaneously address five or more sectors, reflecting a comprehensive approach to urban transformation.

+ **Systemic levers:** The "**Cities of the Future**" experimental area mobilises various systemic levers that operate as mechanisms for structural change. The most frequent are Democracy and Participation (present in at least six projects), reflecting the central role of collaborative governance and citizen engagement; Learning and Capabilities, Governance and Politics, and Financing/Finance are frequently mentioned, highlighting the importance of institutional strengthening and economic viability; and mentions of social innovation, technological infrastructure, and public-private partnerships are also observed.

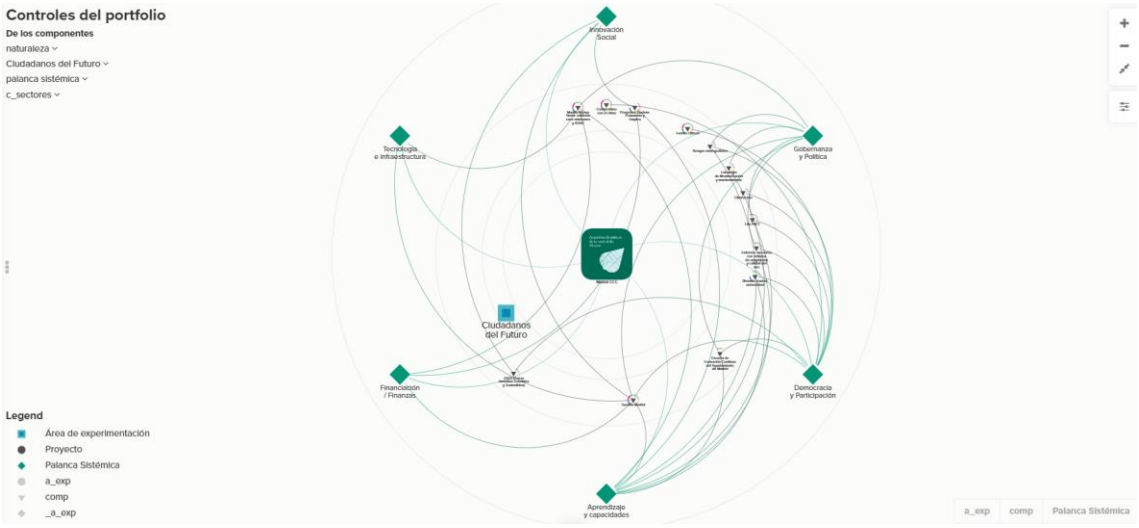
+ **Relevant patterns and combinations:** From the intersection of sectors and levers, recurring combinations are identified that reflect the integrated approach of the interventions. For example, three projects addressing all key sectors (buildings, transport, energy, waste, industry, and adaptation) share the democracy and participation lever, aiming for a comprehensive transformation strategy with a strong emphasis on inclusive governance. The combination of energy, buildings, and industry, along with levers such as governance, policy, and finance, points to urban development models that are intensive in technological transition and economic sustainability. Projects focused on climate change adaptation draw on both social innovation and participatory processes, demonstrating how urban resilience is articulated from the community.

+ **Interpretation and strategic contribution:** The analysis results enable us to conclude that the "**Cities of the Future**" experimentation area presents a holistic and systemic vision of urban transformation. It is not limited to sectoral or technological improvements, but rather promotes new relationships among stakeholders, infrastructure, urban environments, and citizens. This approach allows us to move toward more resilient, inclusive, and carbon-neutral ways of organising the city, aligned with the mission of the Madrid Climate Contract. The combinations of sectors and levers observed reveal an emerging urban model based on collaboration, collective learning, and institutional innovation. Thus, the projects not only act as specific interventions but as seeds of regenerative urbanism, capable of redefining the way we inhabit and transform our cities.

New culture for the citizens of the future

This area transforms the city into a pedagogical space, reimagining urban imaginaries for the ecological transition. Educational infrastructures—from schools to university campuses—are conceived here as true engines of cultural transformation, innovation, and environmental transition. Under this premise, sustainable transformation is understood to be inseparable from a profound transformation of values, capacities, and collective imaginaries. Within this framework, children and youth acquire a strategic role in design and development of the urban future.

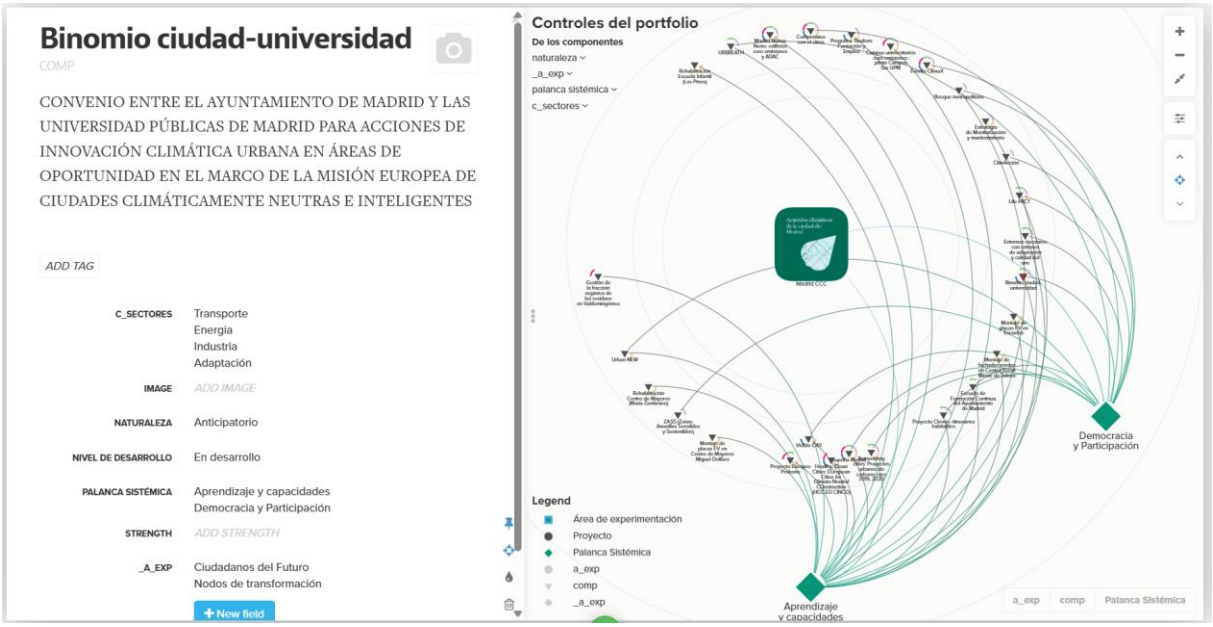
+ **Identification and quantitative analysis:** A total of 13 projects have been identified within the "Citizens of the Future" area. These projects operate on an intersectoral basis that emphasises the role of culture, education, and knowledge as levers of change. The visualisation of the portfolio is defined in the following graphic.



+ **Driving project:** The driving projects in this area are,

  - **The climate transformation of Madrid's 250 public schools into climate-neutral, healthy, and resilient environments**, within the framework of policies such as Madrid + Natural, the Children and Adolescents Plan, the School Environment Strategy, and the Sustainable Mobility Ordinance. Specifically, this line of work has been promoted through the European LIFE PACT project, with direct implementation in the district of Villaverde

  - **The transformation of the 6.5 km² of public university campuses into urban and climate experimentation platforms,** activated through the agreements signed in 2024 between the Madrid City Council and three public universities. These campuses are positioned as spaces for interdisciplinary innovation, knowledge transfer, and civic engagement.



In addition to University Campuses and the climate transformation of schools, other projects that make up this area of experimentation are LIFE PACT, URBREATH, and Bionomio Universidad-Ciudad. For more details, see MODULE B-2: Climate Neutrality Portfolio Design.

+ **Decarbonization sectors:** The intervention sectors are diverse, although with a clear focus on climate change adaptation and the transformation of the built environment. Adaptation appears as the most addressed sector, with three projects dedicated exclusively to this dimension. Comprehensive projects that simultaneously address the building, transportation, energy, waste, industry, and adaptation sectors appear four times, demonstrating a strong commitment to systemic interventions from the educational perspective. This pattern suggests an educational strategy that is not limited to the classroom or discourse but instead involves tangible transformations in the environments where people live, learn, and interact.

+ **Systemic levers:** The most notable systemic levers in this area are aligned with its pedagogical and cultural focus. Democracy and participation are the most frequently used levers, appearing in at least 10 projects. This highlights the value attributed to active citizen engagement as a formative and transformative tool. Learning and capabilities are emphasised (9 mentions), consistent with the city's vision as an expanded classroom. Governance and policy, financing and finance, and technology and infrastructure are also relevant, reflecting an operational dimension aimed at scaling the transformative impact of these initiatives.

+ **Relevant patterns:** The intersection of sectors and levers enables the identification of action logics that align with the strategic vision of this area. For example, all projects that simultaneously address six sectors (building, transportation, energy, waste, industry, and adaptation) incorporate democracy and participation as central levers, along with learning, financing, and technology, generating highly transformative configurations. Climate change adaptation is often associated with social innovation and participatory processes, revealing a specific form of educational governance focused on resilience. In projects focused on the education sector (such as schoolyards or campuses), the articulation between physical and symbolic space is key: places become pedagogical tools, and learning becomes a catalyst for urban transformation.

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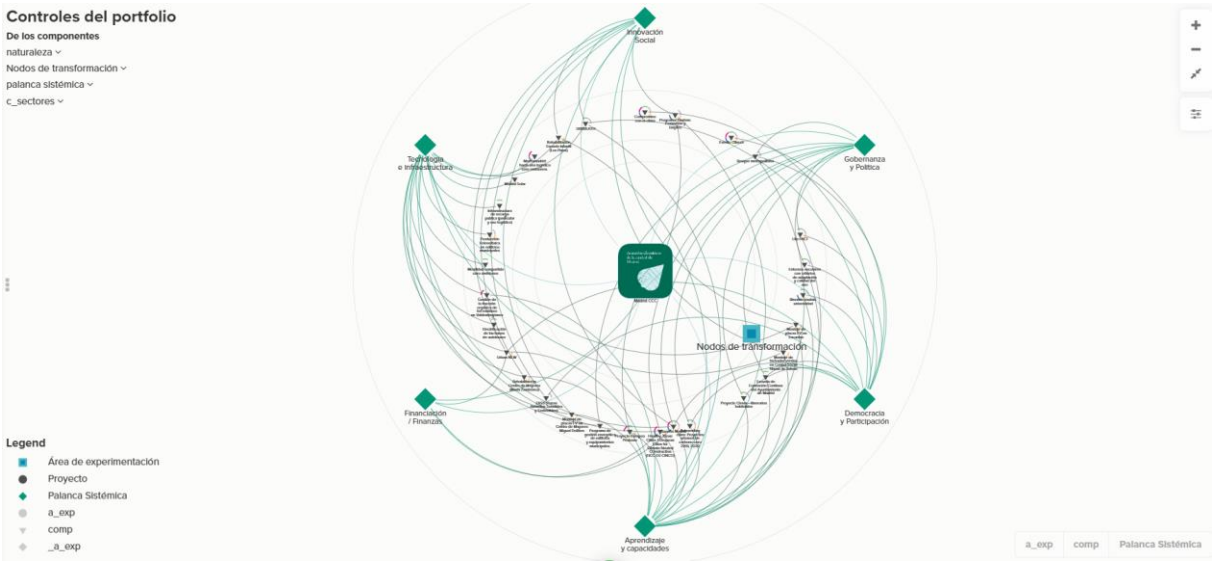
+ **Interpretation and strategic contribution:** The analysis shows that the "Citizens of the Future" area not only promotes educational initiatives but also shapes a new model of governance and urban culture. Schools, universities, and training facilities serve as civic and ecological infrastructures that transform both physical spaces and mentalities. This dimension is especially strategic for the Madrid CCC, as it addresses one of the most complex challenges of the transition: the change in values, habits, and cognitive structures that underpin the current urban model. In this sense, the identified projects are not only part of an educational or environmental policy but also improve an ecology of transition in which citizens are active and conscious protagonists. Thus, this area of experimentation constitutes a bridge between culture and sustainability, between citizen action and structural transformation, and between the present and desirable urban futures.

Nodes of neutrality

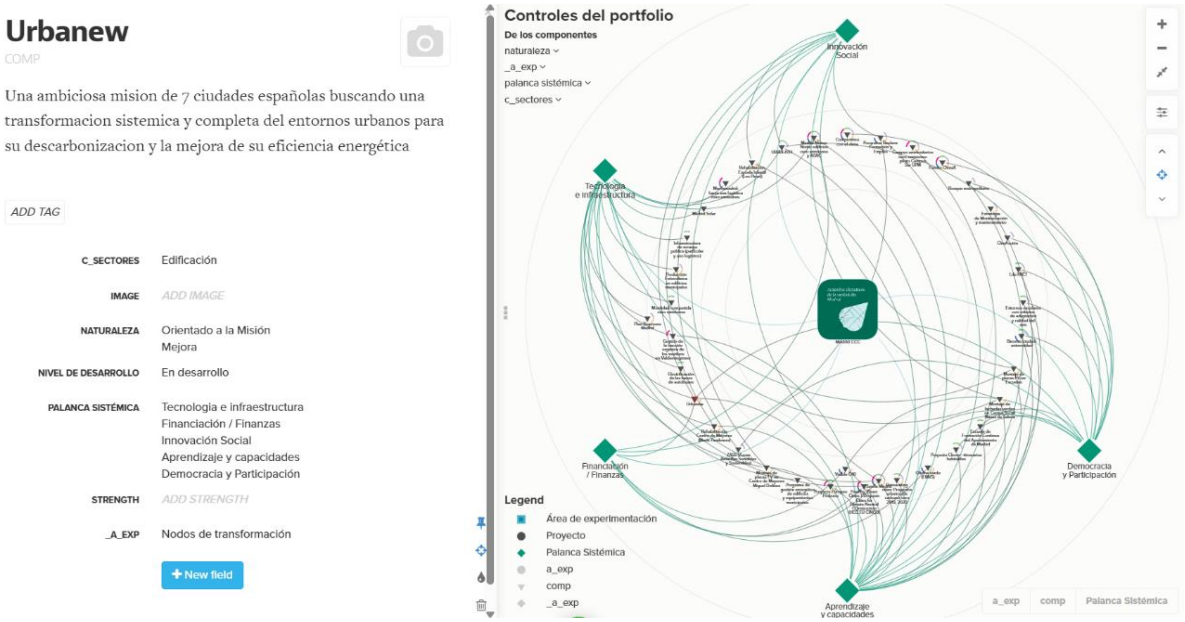
This area is deployed within existing urban fabrics—neighbourhoods, facilities, public spaces—where most of the population lives and where climate transformation must manifest itself most urgently, fairly, and tangibly. Its primary focus lies in activating climate-neutral nodes through strategic interventions in public buildings, streets, squares, and services. These nodes are articulated through accelerated transformation centres, promoted by the City Council, which function as spaces for demonstrative climatic action in the city.

+ **Identification and quantitative analysis:** Within the Madrid CCC portfolio, 27 projects linked to the "Nodes of neutrality" area have been identified. This constitutes one of the largest and most diverse groups, with interventions that combine multiple decarbonization sectors and systemic levers.



- **Driving project:** The driving projects in this area are,
  - **URBANEW:** is a European project—supported by NetZeroCities—in which six Spanish cities, along with Madrid, participate with the goal of achieving a systemic transformation of the urban environment toward decarbonization and energy efficiency. The project seeks to

integrate renewable energy through self-consumption models and energy communities, especially in residential, commercial, and public buildings. It also promotes multi-level governance, encourages innovative financing for vulnerable households, and fosters collaborative learning between cities. Madrid participates with pilot projects such as the design of energy communities in public schools, which guarantees inclusive access to clean energy.



- **Plan Regenera Madrid:** Madrid City Council is implementing the Regenera Madrid Plan, a comprehensive urban intervention covering more than 85 km² of residential areas built before 1985, affecting 1.2 million homes and 2.6 million inhabitants (75% of the city's population). Focusing on the spaces between blocks, this plan seeks to revalue public space.

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Plan Regenera Madrid

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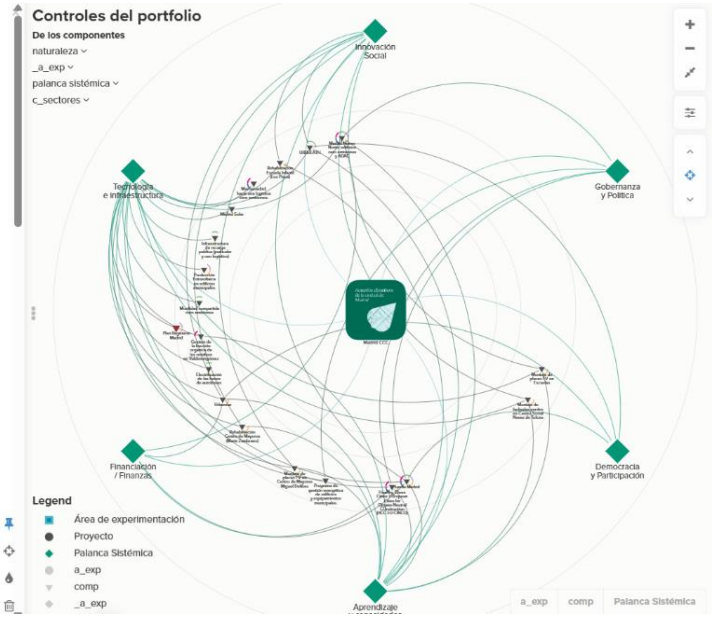
Plan Regenera Madrid, es un plan estratégico de regeneración urbana que busca transformar los barrios más envejecidos y degradados de la ciudad, haciendo de Madrid una urbe más accesible, saludable, cohesionada y sostenible, sin sacrificar la identidad de cada barrio.

- Ámbito de intervención: Interviene sobre más de 85 km² del tejido urbano construido antes de 1985, lo que equivale a casi el 80 % del área residencial y afecta a cerca de 2,6 millones de personas —el 75 % de la población madrileña. Se dará prioridad a los espacios interbloque, que conforman más de un tercio del suelo residencial y habían sido históricamente invisibilizados.

- Áreas de actuación clave:
  // Mejora del espacio público: renovación de calles, plazas, zonas verdes y áreas de juego.
  // Reposición del pavimento, mobiliario urbano, alumbrado, jardinería y arbolado.
  // Garantía de accesibilidad universal: eliminación de barreras arquitectónicas, creación de itinerarios peatonales conectados.



+ **Decarbonization sectors:** The analysis reveals a strong focus on the regeneration of the physical environment and urban infrastructure, with a significant presence of the following sectors: Building and energy are the most frequent combination, present in 5 projects. This indicates a clear commitment to energy rehabilitation and the transformation of the built environment. Integrated interventions addressing all key sectors (building, transportation, energy, waste, industry, and adaptation) are repeated in 3 cases, reinforcing the systemic nature of this area. Transportation is identified as a distinctive sector in at least six projects, underscoring the importance of public space and mobility as integral components of the urban node. This pattern suggests that the nodes are not isolated sectoral interventions, but rather territorial convergences of multiple climate strategies.

+ **Systemic levers:** The deployment of systemic levers points to a structural approach to capabilities, technology, organisational culture and learning. Among them, stand out the social innovation, infrastructure, and technical skills, which appear frequently in most projects related to buildings and energy. Democracy and participation also appear strongly, especially in multi-scale interventions, indicating a willingness to activate these nodes with and for citizens. Governance and politics, and financing/finance are present in smaller numbers but play a key role in more complex projects, where institutional and economic viability are critical.

+ **Relevant patterns and combinations:** The intersection of sectors and levers reveals clear intervention strategies. The seven projects, which focus on buildings and energy, systematically combine the levers of learning and skills, technology and infrastructure, and social innovation, pointing to a comprehensive urban environment reform strategy with a pedagogical and demonstrative component. The more complex projects, which integrate all sectors (up to six simultaneously), operate with a combination of democracy and participation, governance, finance, and technology, activating multiple levers to transform entire neighbourhoods. The transport and adaptation interventions are closely linked to participatory processes, demonstrating how the regeneration of public space can serve as a platform for collective climate transformation.

+ **Interpretation and strategic contribution:** This experimental area serves a dual purpose, operating as a local accelerator of transformation and as the minimum unit for a climate-neutral city. Its implementation reinforces the municipality's role as a key player in the ecological transition, through mechanisms that connect the structural with the everyday. It also constitutes one of the most solid and operational areas of the Madrid Climate Contract. Its main contribution is to transform climate commitment into tangible, localised actions at the heart of the consolidated city. Each node acts as a real urban laboratory, where policies, technologies, citizens, and institutional learning converge.

B-2.1: Description of climate action portfolio		
Emission domains	**Description of climate action portfolio**	
	List of actions	**General description**
Energy systems	- *Comunidades Energéticas*	- A local energy community is a voluntary and open legal body controlled by local shareholders or members, whether individuals or legal entities. Its main function is to generate renewable energy through collective generation plants for shared self-consumption. It can carry out multiple activities: producing, consuming, storing, sharing, or selling energy. Neighborhood communities, neighborhoods, or industrial estates, etc., are part of the community's surroundings.
	- *Madrid Solar*	- Madrid City Council initiative and public-private management model to promote energy self-consumption with photovoltaic panels in the residential, institutional, and service sectors.
	- Deployment of photovoltaic production in municipal buildings (installation in educational centers)	- As part of the "Intervention in educational centers with climate change and air quality adaptation criteria" project, new energy models for distributed energy consumption in the city will be studied, such as the energy communities mentioned above. - Subsector: System decarbonization through renewable energy.
Mobility & Transport	- *Red de recarga de oportunidad* - electric vehicles	- This initiative for the development of Madrid's charging network is part of the Madrid 360 Sustainable Mobility Plan. Its objective is to encourage the use of electric vehicles by facilitating the charging process while citizens carry out other activities. - It is being implemented in three areas: a. Charging stations on municipal plots; b. Rapid charging infrastructure on public streets; c. Charging infrastructure in public parking lots. - Subsector: Electrification of the vehicle fleet (passenger cars) / Electrification of transport (freight)
	- Public electric bike rental service (BiciMAD)	- Public bicycle rental is a service aimed at all citizens and visitors of the city of Madrid, as an alternative form of clean transportation that contributes to a more sustainable mobility model and the promotion of more balanced and healthy transportation habits. - It is currently present in all 21 districts of Madrid, with 630 charging stations and 7,735 electric bikes in operation. - Increase carpooling.
	- *Electro-EMT*	- A project by the *Empresa Municipal de Transportes de Madrid* (EMT, a public limited company for public transport in the city) to offer publicly

		accessible electric charging services in its parking lots. Establishing itself as a public charging manager, the municipal entity is incorporating electric charging into its new mobility service offering, with the aim of adapting to the different needs of users in its network of rotating, park-and-ride, and resident parking. - The project, present in 19 of its facilities, has a total of 199 electrified spaces where users can activate, reserve, and pay for electric charging through the Electro-EMT smartphone app.
	- *Plan de Ayudas Cambia 360*	- Since 2019, these clean technology grants have become a key tool for incentivizing citizens to lead the shift toward sustainability, contributing to compliance with the European Air Quality Directive. - Areas: Private vehicles, charging stations, micromobility, freight distribution, taxis, thermal installations, buses. - Economic endowment: €23.3 million for 2025.
	- HUBS 360	- Mobility hubs 'HUBS 630' are recognizable spaces that combine various services that drive the transformation of mobility in cities, facilitating shared active mobility, electrifying the vehicle fleet, and optimizing logistics activities. - Example (Recoletos 360): With a surface area of 11,370 m2 and 4 floors, it also has 72 spaces for electric car-sharing vehicles, as well as two DUM spaces (urban freight distribution), eight electric charging spaces (two for people with reduced mobility), and 8 BiciPARK spaces. - All of them are under the umbrella of digitalization and are key elements within the Madrid 360 Sustainability Strategy of the Madrid City Council. - There are currently 2 in operation (Canalejas 360 and Recoletos 360) and another 11 planned for 2027.
	- Life-Pact Project: School environments with criteria for adaptation to climate change and air quality	- European project to pilot projects for the naturalization of public spaces, exploring methodologies for engaging school and neighborhood communities in the co-design of naturalized playgrounds and school environments. - This project contributes to the implementation of the municipal strategy for "intervention in school environments from the perspective of improving air quality and adapting to climate change." - Subsector: Reducing the need for personal mobility.
	- *Clever Project - Itinerarios habitables*	- The River to Pradolongo route is an urban regeneration and climate change adaptation project that serves as the background and framework for partial or specific interventions. It serves as the framework for the other two areas and is organized into three levels: a strategy for the route and for the neighborhood, a design and solutions that make the route coherent and recognizable, and specific interventions. - Subsector: Reducing the need for personal mobility.
	- Zero-emission university campuses. Pilot project: Campus Sur UPM	- This intervention aims to promote sustainable mobility for Madrid's younger generations, offering options for more sustainable, safe, and healthy mobility in the surrounding areas of schools while also helping to reduce the carbon footprint and noise pollution in these areas. The actions aim to improve pedestrian and bicycle connections and infrastructure at the entrances to the schools on the *Campus Sur* and other existing facilities in the area. It is intended as a pilot space to investigate changing mobility systems from a multimodal approach that prioritizes active mobility with the extension of BiciMAD to peripheral districts, new multimodal stations, MaaS, fleet electrification, and the extension of the ZBE to the central core of the city.

		- Subsector: Reducing the need for personal mobility.
	- Compromiso con el clima	- Annual event organized by the Madrid City Council and its partners with proposals from citizens and the City Council. All of these proposals share the goal of building new climate narratives and cultivating new hope for the climatic, economic, and social future of the city of Madrid. - Subsector: Promoting active mobility.
	- Mercamadrid: Towards zero-emission logistics	- Transformation of Spain's largest fresh food distribution, marketing, processing, and logistics platform. Implications for other sectors such as the circular economy. - Subsector: Optimizing logistics.
	- Electrification of bus stations	- Strategic collaboration between energy distribution companies, bus manufacturers, smart charging system designers, and public transport companies (EMT) - Subsector: Electrification of the vehicle fleet (buses)
Waste & Circular economy	- Circular City Centre	– A working group led by the General Directorate of Valdemingomez (the Madrid city integrated waste treatment plant) and funded by the European Investment Bank will serve as the basis for drafting the circular economy strategy for the city of Madrid. All city government areas will be involved in this strategy.
	- Estrategia de Prevención y Gestión de Residuos Domésticos y Comerciales de la Ciudad de Madrid – 2030	- A tool for the Madrid City Council to develop its area of responsibility regarding waste, its main objective being to transform waste management in Madrid by applying the principles of the circular economy and the waste hierarchy. - Aimed at prevention, separate collection, preparation for reuse and recycling, as well as reducing landfilling, in line with meeting EU waste management objectives.
	- Management of the organic fraction of waste in Valdemingómez Technology Park	- Launch of a new composting plant for organic and plant fractions to increase biomethane and compost production. - Subsector: Increase recovery rates in the Residential, Commercial and Industrial sector.
Nature-based solutions	*- Calle 30 Natura*	- Calle 30 Natura is a City Council initiative to improve Madrid's air quality and eradicate vandalism by installing vertical gardens on the concrete walls of the M-30. - A pilot project funded with €4 million. - A first 400-meter vertical garden has already been built on Avenida de la Ilustración, equipped with automatic irrigation and a real-time monitoring system for the plants' conditions.
	- Bosque metropolitano	- Green infrastructure that will extend over 75 kilometers of the city, contributing to the city's rebalancing, reducing CO2 emissions, combating climate change, restoring the ecological and landscape of degraded areas, and increasing the range of pedestrian and bicycle routes, as well as benefiting the health of the population.
Social dimension	*- Oficina Verde Móvil*	- Bringing the *Oficina Verde* [a pioneering center created by Madrid City Council to raise awareness about the importance of energy efficiency and sustainability in the capital's residential fabric] closer to the general public by physically visiting Madrid's 21 districts to inform them about its existence, disseminate local measures, and answer questions. - Subsector: Building Renovation

Public space / Built environment	- Energy Management System [Municipal Buildings and Facilities]	- This involves comprehensive management, using specially developed software, of a building's energy consumption, aimed at optimizing it through monitoring, control, and analysis in accordance with the UNE-EN ISO 50001:2018 standard in municipal centers of the Madrid City Council; - This management system is currently integrated into buildings with a variety of uses (libraries, cultural centers, sports centers, etc.), providing instruction in behavioral guidelines aimed at energy savings and encouraging user participation in good energy efficiency practices.
	- *Rehabilita Madrid Plan*	- The purpose of these grants is to encourage and promote the implementation of accessibility, conservation, energy efficiency, health, and safety measures in existing residential buildings. - Examples of eligible measures include insulation improvements or the installation of renewable energy equipment.
	- Zero-emission buildings in the *ADAC Madrid Nuevo Norte – Centro de Negocios Chamartín*	- Emphasis on the construction of zero-emission buildings in this new urban development, with the ambition of being climate-neutral. The first *Área Demostradora de Acción Climática* de la ciudad (Centro de Negocios Chamartín) is located here. - Subsector: New zero-emission buildings.
	- Reinventing Cities: Zero-carbon urban projects 2019, 2020	- Initiative supported by the C40 Cities Network to develop demonstration projects with decarbonization criteria for the transformation and reactivation of urban sites. - Subsector: New zero-emission buildings.
	- Probono European 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 commercial buildings and will be controlled and managed under a digital model that will allow for maximum performance, stakeholder engagement, scaling, and replication. - Subsector: Decarbonization of thermal installations.
	- *Plan Regenera Madrid*	- It proposes the recovery of the consolidated city built before 1985, defining a Healthy Neighborhood (*Barrio Saludable*) model that addresses the physical, environmental, and social dimensions. The Plan includes interventions in the **inter-block spaces** (residential areas that represent more than a third of Madrid's residential land), which will undergo a comprehensive transformation to improve their functionality and aesthetics, promoting social cohesion and coexistence. - The paving is designed to counteract climate change, as its permeability regulates surface temperature and mitigates the "heat island" effect.

B-2.2: Individual Action Schemes		
Action scheme	**Name of the action**	**MADRID NUEVO NORTE**
	Type of action	Urban and real estate development. A private and public development initiative.

	Description of the action	Madrid Nuevo Norte is a unique urban intervention that will transform a 5.6 km stretch of land and regenerate more than 2.3 million m². The project arose from the need to integrate the Chamartín train station and all the railway facilities that extend from it into the city. For more than 50 years, these infrastructures have created a huge gap that divides the north of Madrid in two, causing inconvenience to millions of citizens. This urban regeneration project will not only heal this wound, solving problems of mobility, safety, and lack of public services, but will also place Madrid among the group of cities best able to cope with the major 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 and compact city that focuses on people, public space, and sustainable mobility, where housing, offices, shops, green areas, and amenities blend and complement each other, creating the best environment for living, working, and enjoying life. Respecting the essence that makes our city so attractive, while enhancing its innovative and cosmopolitan character. A city model that considers everyone, designed through participatory processes that have allowed us to listen to citizens to understand their distinct needs and the different uses each makes of their city. The project is organized into four distinct areas that will be developed through an offset system with specific urban planning regulations that make it a benchmark in sustainability. It is estimated that these regulations will allow it to reduce expected emissions by a 20% by 2030, with buildings that go beyond the concept of nearly zero-consumption buildings and with a mobility policy to promote sustainable mobility. Furthermore, within this framework, one of the areas will be declared an "*Área Demostradora de Acción Climática* (ADAC)", a climate action demonstration area for which an Action Plan has been approved with the aim of developing a climate-neutral neighborhood.
Reference to the impact pathway	**Emission domains**	Energy systems / Mobility & Transport / Public space / Built environment
	Systemic lever	Technology & Infrastructure / Governance & Policy / Learning & capabilities.
	Result (according to module B-1.1)	
Implementation	**Agencies/persons responsible for implementation**	- Comisión Gestora del Centro de Negocios Chamartín / Junta de Compensación de Centro de Negocios Chamartín - Comisión Gestora de Malmea - San Roque - Tres Olivos / Junta de Compensación de Malmea - San Roque – Tres Olivos - Crea Madrid Nuevo Norte, S.A. - ADIF, Comunidad de Madrid, Ayuntamiento de Madrid.
	Scale of action and target entities	

	Actors involved	Madrid City Council, 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, landowners will form Compensation Boards, entities responsible for drafting and constructing the urban development project, which must be approved and accepted by the Madrid City Council or the relevant bodies, and for drafting the reparcelling project for the distribution of land ownership following the urban transformation. The administrations will be responsible for executing public construction, and the real estate developers for private construction.
Impacts and costs	**Renewable energy generated (if applicable)**	
	Energía eliminada / sustituida, volumen o tipo de combustible	
	Estimated GHG emission reductions (total)	107,720 tCO2eq not added in 2030. In a fully implemented MNN scenario.
	Total costs and costs per unit of CO2eq	€7.163 millions 66.500 €/tCO2eq only taking into account the estimated emission reduction for the year 2030.

B-2.2: Individual Action Schemes		
Action scheme	**Name of the action**	**URBREATH**
	Type of action	European project for the implementation of Nature-based Solutions (NbS) and digital tools to accelerate climate neutrality: nature trails in the Villaverde District.
	Description of the action	The European project URBREATH aims to demonstrate how Urban Nature Pathways can serve as systemic solutions to improve the quality of life in cities, strengthen social cohesion and economic activity, mitigate climate change, and foster urban adaptation. Through an integrative approach, URBREATH combines nature-based solutions, technological innovation, citizen co-creation, and multi-level governance to support the objectives of the EU Missions on Climate Change Adaptation and Climate-Neutral Cities. In Madrid, the project focuses on the district of Villaverde, an area with significant social and environmental challenges, to test an approach that can be scaled to other districts, bringing its lessons learned to the rest of the city. The local approach

		prioritizes the co-design of solutions with residents, social organizations, and institutional actors, adapting interventions to the specific urban context and enhancing its capacity for climate resilience and urban regeneration. The goal is to implement a system of interconnected NbS—such as green trails, blue infrastructure, and adaptive public spaces—supported by digital twins, artificial intelligence, and collaborative planning tools to achieve climate, social, and economic benefits for the area.
Reference to the impact pathway	**Emission domains**	Nature-based solutions / Social dimension / Public space - Built environment
	Systemic lever	Technology & Infrastructure / Social innovation / Democracy - Participation / Finance & funding / Learning & capabilities
	Result (according to module B-1.1)	Key goals include increasing the district's climate resilience, reducing social and environmental vulnerability, improving urban health, strengthening local commercial activity, activating new forms of governance, and generating scalable evidence for other European cities.
Implementation	**Agencies/persons responsible for implementation**	Local public administrations, universities, research centers and private entities.
	Scale of action and target entities	The URBREATH project in Madrid is being developed through two pilot projects in the Villaverde district: - Urban regeneration in San Cristóbal; - School environment at CEIP Antonio Nebrija.
	Actors involved	- Citizens; - Social, private, and academic sectors; - Madrid City Council:DG de Sostenibilidad y Control Ambiental DG de Agua y Zonas verdes DG de Planificación Estratégica DG de Planificación e Infraestructuras de Movilidad DG de Regeneración Urbana DG de Innovación Distrito de Villaverde; - Governance expert: DML Dark Matter Labs. - Technical Expert, Communication and Research: Universidad Politécnica de Madrid. - Social expert: Traza Consultoría y Colectivo Basurama.
	Comments on implementation	
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 CO2eq	

B-2.2: Individual Action Schemes		
Action scheme	**Name of the action**	**URBANEW**
	Type of action	Accelerating decarbonization and energy rehabilitation.
	Description of the action	URBANEW is a pilot project funded by the European Union that seeks to accelerate decarbonization in seven Spanish cities, including Madrid. This approach has led to the development of guidelines for rapid urban decarbonization over two years, making it a selected proposal for Pilot Cities (2022 Mission Cities / Net Zero Cities). Together with the entire community and key stakeholders, the project will identify levers of change to decarbonize the built environment and promote the integration of renewable energy in cities. The project will also analyze the role of the Administration in new energy models and define mechanisms to guarantee equal opportunities and access to renewable energy sources for the entire population. The process seeks to make homes and public buildings energy-efficient, emphasizing the promotion of professional support in community decision-making, given the need for informed agreements, and raising social awareness about the need for sustainable renovation to improve the health and living conditions of its inhabitants. Some of the project's strengths: - Expand renewable energy generation capacity through self-consumption and energy communities; - Promote a multi-city governance model that fosters connections, partnerships, and complementarity among organizations, stakeholders, and citizens; - Promote an innovative renovation financing model specifically focused on vulnerable families, with objectives such as the creation of guarantee funds (mainly salary), repayable advances, or mortgage-backed loans on highly advantageous terms. Given its pioneering nature, the replicability of accelerated actions is essential. Also noteworthy is the selection of a Pilot Solution, based on the energy renovation of a building, a preschool and primary school [CEIP El Greco, Villaverde].
Reference to the impact pathway	**Emission domains**	Energy systems / Waste & Circular economy / Social dimension / Public space / Built environment
	Systemic lever	Technology & Infrastructure / Social innovation / Democracy - Participation / Finance & funding / Learning & capabilities
	Result (according to module B-1.1)	Energy Renovation: By improving the energy efficiency of buildings, the amount of energy required and, therefore, GHG emissions are reduced. If we also use renewable energy sources, emissions can be almost zero.

		Use of Local Biomaterials: Use local biological materials, such as wood, for renovation. These materials are reusable, recyclable, and help reduce CO2 in the atmosphere.
Implementation	**Agencies/persons responsible for implementation**	A joint governance model for the pilot solutions is being designed, driven by the SG de Energía y Cambio Climático (the sub directorate for energy and climate change): association/cooperative, financing model, relationship between the School, the Board and the Energy Community, etc.
	Scale of action and target entities	Various pilot projects in the municipality.
	Actors involved	The project entails the creation of a multi-stakeholder working group to involve citizens and the private sector in the process with a focus on systemic transformation.
	Comments on implementation	
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 CO2eq	
	Comments on implementation	

B-2.2: Individual Action Schemes		
Action scheme	**Name of the action**	**SUEÑA MADRID**
	Type of action	Participatory space for meeting and reflection for better governance in urban planning
	Description of the action	The project will bring together all stakeholders interested in the 360 Urban Strategy, the future '*Plan General de Ordenación Urbana*' (the new general ordinance urban plan for Madrid). The future 360 Urban Strategy, which includes the 'Sueña Madrid' initiative, will address the three main challenges facing cities today: housing, urban transformation, and sustainability. In this sense, it will lay the foundations to make Madrid the European capital with the largest supply of affordable housing for families and, especially, for young people. The new Plan will also seek to consolidate Madrid as the city most concerned with the quality of its public spaces and as a city prepared for the major future challenges in terms of sustainability, energy efficiency, environmental regeneration, and greening. The Sueña Madrid project, and specifically its website sueñamadrid.es, was created with a dual purpose. First, to serve

		as a reference point for all those seeking information on the drafting process of the 360 Urban Strategy, and second, to act as a driving force and encourage the entire community—residents, organizations, and associations—to take part in the participatory process through the development of proposals and suggestions, based on the slogan "Sueña Madrid." The *Plan General Office*, located at 5 Plaza de la Villa, will be the meeting point for the stakeholders involved.
Reference to the impact pathway	**Emission domains**	Social dimension / Public space - Built environment
	Systemic lever	Governance & Policy / Democracy - Participation
	Result (according to module B-1.1)	Through this initiative, the aim is to highlight concerns and proposals that will lead to economically and socially sustainable urban planning through the following key areas: - Improving energy efficiency and reducing demand in the three main sectors: buildings, transportation, and waste. - Increasing the contribution of renewable energy to the city's energy mix. - Reducing greenhouse gas and pollutant emissions into the atmosphere.
Implementation	**Agencies/persons responsible for implementation**	To develop the 360 Urban Strategy, an Urban Planning Advisory Council (CAU) composed of experts has been created, and nine working groups have been set up with representatives from the three administrations (state, regional, and local), as well as organizations, institutions, associations, companies, and professional associations.
	Scale of action and target entities	Any citizen can submit a proposal to the Office for analysis using a simple online form. Institutions are also able to sign the '*Convenio de Estrategia Urbana'* (the agreement for the new urban strategy). In this case, the implementation of the actions included in the agreement will provide a professional and academic perspective on the problems posed by urban planning instruments as currently configured, and on the various alternatives for the future city model.
	Actors involved	The project is open to collaboration from public administrations, academia, professionals and citizens.
	Comments on implementation	
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 CO2eq	

B-2.2: Individual Action Schemes

MADRID

Action scheme	**Name of the action**	**PROGRAMA TANDEM**
	Type of action	Promoting a just green transition
	Description of the action	As part of the VISIBLE project, organized by the C40 Cities network, it is a pilot program to promote a fair and economically viable transition in built environments. Particularly noteworthy is the "EmpléaTe Verde Project," a training program alternating with employment within this program. Signed by the Energy and Climate Change Sub Directorate of the Madrid City Council as a document of support and willingness to collaborate with ECODES [*Fundación Ecología y Desarrollo* / Ecology and Development Foundation] in July 2023, the Spanish Public Employment Service (*Servicio Público de Empleo Estatal, or* SEPE), positively assessed the project, granting ECODES the appropriate funding for its development in December of that same year. The objective of this project is to ensure that young unemployed people, with a special focus on young refugees or stateless people in the municipality of Madrid, benefit, after a vocational training process, from initial work experience in a segment of the labor market where there is currently a high demand for professionals by companies, as well as significant career and professional development opportunities for young people. Other planned actions include energy efficiency advice for residents of the neighborhood where the project will be carried out, environmental education programs if any interventions are carried out in schools, and more. Likewise, as a result of the '*EmpléaTe Verde Project*', the city of Madrid and its residents will benefit from energy advisory services for citizens and sustainable renovations carried out in public spaces. Through the climate strategy in educational centers, we contacted ITD UPM, with whom we formed the Platform for Green Employment and Entrepreneurship, a multi-stakeholder alliance working to connect new green jobs resulting from the ecological transition with people in vulnerable situations.
Reference to the impact pathway	**Emission domains**	Energy systems / Social dimension
	Systemic lever	Social innovation / Finance & funding / Learning & capabilities
	Result (according to module B-1.1)	Through the "EmpléaTe Verde" Project, supported by the Office of the United Nations High Commissioner for Refugees (UNHCR-Spain), the aim is to achieve a triple impact: - Retraining and support for green jobs for unemployed young people; - Adaptation to climate change, aligned with the municipality's climate strategy through interventions in the targeted buildings; - Improving energy efficiency with one or more of the following elements: • Through window replacement; • Through green envelopes; • Through interventions aimed at improving insulation;

		• The installation of renewable energy sources.
Implementation	**Agencies/persons responsible for implementation**	Madrid City Council SEPE ECODES
	Scale of action and target entities	
	Actors involved	Specifically, the Platform for green jobs is a multi-stakeholder alliance working to connect new green jobs resulting from the ecological transition with people in vulnerable situations. It is comprised of: - ECODES - GECV (Grupo Español de Crecimiento Verde) - UPM - itd UPM - Ingeus (an employment support company)
	Comments on implementation	
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 CO2eq	

B-2.2: Individual Action Schemes		
Action scheme	**Name of the action**	**LIFE PACT**
	Type of action	European project to carry out pilot projects for the naturalization of public spaces using 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 Madrid City Council and the cities of Leuven and Krakow. Through this project, the Madrid City Council, in collaboration with *Universidad Politécnica de Madrid* and the Democratic Society, is exploring methodologies for engaging school and neighborhood communities in the co-design of naturalized playgrounds and school environments. This project contributes to the implementation of the municipal strategy for "Intervention in school environments from the perspective of climate change mitigation and adaptation." Specifically, two pilot projects are being developed in two preschool and primary schools in the San Cristóbal de los

		Ángeles, Villaverde District neighborhood. The selection of this location is based on several reasons: the high vulnerability to climate change, particularly heat waves, drought, and biodiversity loss; the socioeconomic profile of its residents, which makes them more susceptible to the impact of climate change and, specifically, summer energy poverty; and a fairly cohesive social fabric committed to the development and well-being of its surroundings. In the first year of project development, a social and climate assessment of the neighborhood was conducted, led by Gea21, Surcos Urbanos, and the ABIO research group at Universidad Politécnica de Madrid. In addition, various workshops were held with school communities, particularly with elementary school students, using micro-intervention and creative writing methodologies. The objective was to gain an in-depth understanding of the dynamics of space use and imagine a future scenario of a naturalized playground open to the community. This process was facilitated by three stakeholders: Democratic Society, Basurama, and Asamblea de la Infancia del Instituto Mutante de Narrativas Ambientales. This participatory diagnosis and the resulting proposals have given rise to two preliminary projects. In 2023, two architecture and engineering firms are developing preliminary designs for construction. These projects also explore the incorporation of more permeable materials with a lower carbon footprint. Construction work is scheduled for 2023 (demolition of perimeter walls and construction of more visible fences) and 2024 (naturalization). As the spaces are expected to be open outside of school hours, a sustainable use and maintenance plan for the spaces is being designed with the school and neighborhood communities. To this end, co-management models between the public administration and residents are being explored. This project represents an important source of learning for the City Council from several perspectives: strengthening interdepartmental and district work; closer contact with residents; and experimentation with new methodologies and more creative solutions. From a citizen perspective, this project is helping to raise awareness among primary school children about climate change and its consequences, turning them into agents of change in their own built environment.
Reference to the impact pathway	**Emission domains**	Mobility & Transport / Nature-based solutions / Social dimension / Public space - Built environment
	Systemic lever	Governance & Policy / Democracy - Participation / Learning & capabilities
	Result (according to module B-1.1)	From the perspective of climate change mitigation and adaptation, a more naturalized environment will help reduce the heat island effect and capture more carbon.
Implementation	**Agencies/persons responsible for implementation**	Ayuntamiento de Madrid. Subdirección General de Energía y Cambio Climático Junta de Distrito de Villaverde.

	Scale of action and target entities	- Patios y entornos escolares. Barrio de San Cristóbal de los Ángeles; - Colegio de Educación Infantil y Primaria Sagunto; - 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	
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 CO2eq	

B-2.2: Individual Action Schemes		
Action scheme	**Name of the action**	**HEALTHY, CLEAN CITIES: EUROPEAN CITIES FOR CLIMATE-NEUTRAL CONSTRUCTION (HCC EU CINCO)**
	Type of action	Research and policy advocacy
	Description of the action	Funded by the Laudes Foundation since early 2021, the project aims to research and prototype solutions that reduce emissions from the construction sector. 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', prepared by Material Economics, which sets out the reasons why buildings contribute significantly to climate change

		and the strategies (in terms of design choices and material selection) that could reduce the carbon embedded in buildings. Furthermore, the report proposes the use of wood as a cost-effective way to reduce emissions, analyzing potential barriers and financial opportunities. 2. 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 for a materials passport, developed by Dark Matter Labs and REDO 8. Review of municipal price lists and tender clauses for Madrid Nuevo Norte 9. Training for municipal technicians to promote circular and natural-origin construction in public projects in Madrid, developed by Dark Matter Labs and Universidad Politécnica de Madrid
Reference to the impact pathway	**Emission domains**	Waste & Circular economy / Nature-based solutions / Public space - Built environment
	Systemic lever	Technology & Infrastructure / Governance & Policy / Finance & funding / Learning & capabilities
	Result (according to module B-1.1)	The project enables a reduction in CO2 emissions by promoting circularity and using natural, low-carbon materials.
Implementation	**Agencies/persons responsible for implementation**	Crea Madrid Nuevo Norte y aliados
	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	
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 CO2eq	

B-2.2: Individual Action Schemes		
Action scheme	**Name of the action**	**COMPROMISO CON EL CLIMA**
	Type of action	Annual citizen engagement event
	Description of the action	Climate Commitment is an annual event organized by the Madrid City Council in collaboration with the Casa Encendida of the Montemadrid Foundation, The Democratic Society, and the Center for Innovation in Technology for Human Development of the Polytechnic University of Madrid. This event has already been held twice in a hybrid format: Madrid Zero Emissions (2021) and Misión Madrid (2022). **Madrid Emisiones Cero** (2021) was a first contact with the radical climate commitment initiatives already underway in Madrid. These included proposals from organized citizens and the City Council. All shared the goal of building new climate narratives and cultivating new hopes for the climatic, economic, and social future of the city of Madrid. The session served to disseminate their objectives, strategies, and organizational approaches. In addition, the event unveiled the city's solutions for reducing CO2 emissions, mitigating heat waves, and water shortages—the fundamental changes we must promote in the way we educate about the environment or coexist with plants, animals, and bacteria. **Misión Madrid** (2022) reinforced the objective of the previous event but framed the initiatives presented as part of the path toward achieving the "100 Climate-Neutral Cities by 2030" Mission, for which Madrid has been selected. Unlike the previous year, the concept of "micromissions" was introduced: citizens and institutions have joined together to achieve the Mission on a smaller scale and contribute to climate transformation projects in industrial estates, public facilities, and schools, where environments are dominated by nature, play, and coexistence.
Reference to the impact pathway	**Emission domains**	Social dimension
	Systemic lever	Social innovation / Democracy - Participation
	Result (according to module B-1.1)	This project promotes experimentation and innovation to help other European cities achieve the goal of climate neutrality by 2050.

Implementation	**Agencies/persons responsible for implementation**	Ayuntamiento de Madrid
	Scale of action and target entities	
	Actors involved	La Casa Encendida, Fundación Montemadrid, el Centro de Innovación en Tecnología para el Desarrollo Humano of Universidad Politécnica de Madrid (itdUPM), Antonella Broglia, Zuloark, EIT Climate-KIC, C40, Fundación Laudes
	Comments on implementation	
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 CO2eq	

B-2.2: Individual Action Schemes		
Action scheme	**Name of the action**	**CONVENIO AYUNTAMIENTO DE MADRID - UNIVERSIDADES**
	Type of action	Research, knowledge transfer, and university community involvement in climate innovation.
	Description of the action	The Convenio (a kind of agreement), formalized in terms of financing as a grant of a nominal subsidy (renewable annually) in favor of the three participating Public Universities: U. Complutense de Madrid (UCM), U. Politécnica de Madrid (UPM) y U. Autónoma de Madrid (UAM). Urban climate innovation actions will contribute to advancing the objectives of the Roadmap to Climate Neutrality by 2030-50 for the city of Madrid, the climate change adaptation strategy, and the European-level objectives of the Madrid Mission for Smart and Climate-Neutral Cities by 2050. The following formats are established for their development: 1. Research Lines; 2. Knowledge Transfer; 3. Involvement of the university community and integration with citizens; 4. Active measures by universities in climate change mitigation and adaptation; 5. Promotion of climate culture and communication, as well as collaboration with other sectors.
	Emission domains	Social dimension
	Systemic lever	Finance & funding / Learning & capabilities

Reference to the impact pathway	**Result (according to module B-1.1)**	The various themes impact the culture of collective effort on climate action based on knowledge and the implementation of scientifically verifiable actions, such as: 1. [UCM] Urban health, social resilience, and narratives associated with climate change; 2. [UPM] Climate mitigation and adaptation in the city, design of urban action priorities and strategies, and promotion of the Campus Sur functional area as a Demonstration Area (ADAC); 3. [UAM] Ecological restoration and biodiversity, and the legal framework for energy communities.	
Implementation	**Agencies/persons responsible for implementation**	Ayuntamiento de Madrid Public Universities: UCM, UPM, UAM.	
	Scale of action and target entities	Public Universities with Campuses with the Potential for Climate Experimentation in the Municipality of Madrid.	
	Actors involved	University departments and teams most suitable and relevant to the proposed lines of work.	
	Comments on implementation		
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 CO2eq		

B-2.2: Individual Action Schemes		
Action scheme	**Name of the action**	**VISIBLE C40**
	Type of action	Research in accessible bioclimatic construction, with policy impact in regulatory areas aimed at equity.
	Description of the action	An initiative of C40 Cities, this is a sustainable construction project. Its objectives include: enabling the pilot cities (Madrid, London, and Oslo) to integrate the delivery of affordable, low-carbon housing; requiring full-lifecycle carbon measurement in new developments; and expanding retrofitting and reusing materials in a socially equitable and economically viable manner. The project will build a strong consensus among stakeholders within each city on how social equity and workers' rights can be integrated into the sector's transition.
Reference to the impact pathway	**Emission domains**	Waste & Circular economy / Nature-based solutions / Public space - Built environment
	Systemic lever	Technology & Infrastructure / Learning & capabilities

	Result (according to module B-1.1)	Through this project, embedded carbon buildings will harness the power of cities to decarbonize their built environments in a fair and economically viable way, which will support the development of the climate agenda.
Implementation	**Agencies/persons responsible for implementation**	Ayuntamiento de Madrid C40.
	Scale of action and target entities	
	Actors involved	Área de Gobierno de Políticas de Vivienda / EMVS
	Comments on implementation	
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 CO2eq	

B-2.2: Individual Action Schemes		
Action scheme	**Name of the action**	**PLAN REGENERA MADRID**
	Type of action	Renovating public spaces to adapt them to people's changing needs, lifestyles, and sustainability and accessibility criteria, which requires research and impact on public policy.
	Description of the action	With interventions in more than 80% of the city, the Regenera Madrid Plan will renovate areas built more than 40 years ago. More than 75% of the population will benefit from these improvements in pavements, trees, accessibility, and other urban environment enhancements. Bioclimatic buildings (embedded carbon) play a very important role in the various initiatives.
Reference to the impact pathway	**Emission domains**	Nature-based solutions / Public space - Built environment
	Systemic lever	Social innovation / Learning & capabilities
	Result (according to module B-1.1)	Creating more sustainable neighborhoods encompasses a wide range of climate measures, from tree planting and its resulting ecosystem benefits to other issues such as increasing biodiversity, responsible water use through efficient irrigation systems, and traffic control in suburban residential areas.
Implementation	**Agencies/persons responsible for implementation**	Ayuntamiento de Madrid C40.

	Scale of action and target entities	
	Actors involved	Área de Gobierno de Políticas de Vivienda / EMVS
	Comments on implementation	
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 CO2eq	

MADRID

B-2.3: Summary of the residual emissions strategy
A significant part of the municipal strategies regarding residual emissions is linked to the management and treatment of biowaste generated by the city, which is carried out at the Valdemingómez Technology Park (PTV). Along with other highly significant co-benefits, the PTV also recovers non-recyclable waste for energy and harnesses biogas, a process that reduces methane emissions through anaerobic decomposition (biomethanation) of organic matter. This biogas is purified and concentrated for injection into the natural gas network. The surplus, along with the biogas generated at the old landfill and the now-decomposed cells at the current landfill, is used to produce electricity, thereby avoiding the consumption of other fossil-fuel-based energy sources. 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. Specifically, **Madrid Compensa** is a voluntary programme for offsetting CO2 emissions and generating ecosystem services of the Madrid City Council. CO2 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 CO2 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 adopted (Nov. 2022) 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 on agricultural land and will contribute to the EU's climate, environment and zero pollution objectives. Regulation (EU) 2024/3012 of the European Parliament and of the Council establishes this Union certification framework for permanent carbon removals, carbon culture and carbon storage in products, which will serve as a guide in the processes and initiatives developed by the city in this regard and in particular on residual carbon emissions through embedded carbon (i.e.: Healthy, Clean Cities: EUropean Cities for Climate-Neutral COnstruction (HCC EU CINCO))

MADRID

MODULE B-3

Monitoring, evaluation and learning indicators

Outcomes / impacts addressed by Domains	Co-analyzed actions by indicators.	No. of indicator	Indicator Title [Specific and General monitoring]
ENERGY SYSTEMS: - Reduction of GHG emissions (due to the effect of increased electrification of energy demand, generation of clean local energy (PV) and reduction of energy consumption)	- *Comunidades Energéticas*	1.7.1	- Evolution of the electricity emission factor (national level)
		1.7.2	- Renewable electricity generation
MOBILITY & TRANSPORT: - Promoting clean mobility under different formulas as a way to reduce emissions. - Discouraging the use of emission sources through regulations. - Reduction in the number of trips.	- Red de recarga de oportunidad - electric vehicles. - Public electric bike rental service (BiciMAD). - *Electro-EMT* - *Plan de Ayudas Cambia 360* - HUBS 360	3.1.1	- Evolution of traffic intensity
		3.1.2	- Evolution of the mobility of private cars
		3.2.1	- Evolution of pedestrian mobility
		3.2.2	- Developments in public transport mobility
		0.0.2	- Annual emissions from light and heavy duty vehicles
		1.3.1	- Total GHG emissions in the road transport sector
		3.3.1	- Relative growth of ZERO passenger car registrations
		3.3.2	- Relative growth of ZERO taxis registration
		3.3.3	- Evolution of ZERO buses compared to total buses (EMT)
		3.3.4	- Relative growth of electric freight transport registrations
WASTE & CIRCULAR ECONOMY: - Reduction of logistics routes, packaging, waste, etc. - Reduction of production inputs, with their corresponding carbon footprint, particularly energy inputs.	- *Circular City Centre* - *Estrategia de Prevención y Gestión de Residuos Domésticos y Comerciales de la Ciudad de Madrid – 2030.*	5.2.1	- Evolution of the recovery rate in residential, services and municipal sectors
		5.3.1	- Evolution of the total mass of bio-waste collected separately

NATURE-BASED SOLUTIONS: - CO2 reduction benefits linked to urban greening.	- *Calle 30 Natura*	1.6.1	Evolution of CO2 removals (sinks)
SOCIAL DIMENSION		7.2.1	- Average household income
PUBLIC SPACE / BUILT ENVIRONMENT: - Avoid emissions through increased thermal electrification and improved thermal and lighting efficiency. - Reduction in energy inputs and the corresponding reduction in emissions. - Improvement in building envelopes and the efficiency of their thermal equipment.	- Energy Management System [Municipal Buildings and Facilities] - *Rehabilita Madrid Plan*	1.2.1	- Total GHG emissions in the residential sector
		1.4.1	- Total GHG emissions in the services sector
		0.0.1	- Final energy consumption in RCI
		2.1.1	- Evolution of the number of rehabilitated dwellings
		2.1.2	- Evolution of rehabilitated surface area
		2.2.1	- Evolution of the number of coal-fired boilers2.2.
		2.2.3	- Contribution of electricity to total final energy consumption (residential and services sectors)

B-3.2: Indicator metadata	
Indicator Title	**EVOLUTION OF THE ELECTRICITY EMISSION FACTOR (NATIONAL LEVEL)**
Identification number	1.7.1
Unit of measurement	tCO2 / MWh
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.
Calculation Formula	It is obtained by REE and is included at the GHG emissions inventory of the municipality of Madrid (2024 update, year 2022)
Is the indicator captured by existing CDP/SCIS/CoM platforms?	NO
Planned data source	Inventory of Madrid City Greenhouse Gas Emissions (2024 update, year 2022).
Planned availability	Annual

Planned collection interval	2015-2030
Results describing the indicator	

Variables	Unidades	2015	2016	2017	2018	2019	2020	2021	2022
Indicador	tCO_2/MWh	0,348	0,284	0,326	0,283	0,222	0,171	0,164	0,206
Evolución indicador	(2015=100)	100	82	94	81	64	49	47	59

B-3.2: Indicator metadata	
Indicator Title	**RENEWABLE ELECTRICITY GENERATION**
Identification number	1.7.2
Unit of measurement	Ktoe [kilotonnes of oil equivalent]
Definition	- We monitor the inclusion of non-GHG-emitting technologies in electricity production within the municipality of Madrid. - Expected trend: increasing.
Calculation Formula	- 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.
Is the indicator captured by existing CDP/SCIS/CoM platforms?	Yes, partially considered: [3.2) For each type of renewable energy within the jurisdiction boundary, report the installed capacity (MW) and annual generation (MWh)].
Planned data source	Energy balance of the municipality of Madrid (2024 update, year 2022).
Planned availability	Annual
Planned collection interval	2015-2030
Results describing the indicator	

Variables	Unidades	2015	2016	2017	2018	2019	2020	2021	2022
Indicador	ktep	22	23	24	24	26	35	34	31
Evolución indicador	(2015=100)	100	102	109	107	118	156	152	140

B-3.2: Indicator metadata	
Indicator Title	**EVOLUTION OF TRAFFIC INTENSITY**
Identification number	3.1.1
Unit of measurement	Thousands of vehicles / day.
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. - 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 Formula	- Ratio of total average daily intensity on working days, annual average (IMD) in No. of vehicles / day, divided by 1,000.

Is the indicator captured by existing CDP/SCIS/CoM platforms?	NO
Planned data source	Madrid City Council's Open Data Portal
Planned availability	Annual
Planned collection interval	2015-2030
Results describing the indicator	Evolución de la intensidad de tráfico Variables / Unidades / 2015 / 2016 / 2017 / 2018 / 2019 / 2020 / 2021 / 2022 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 / 1.848.772 **Indicador / Miles de vehículos / día / 2.184 / 2.168 / 2.135 / 2.094 / 2.061 / 1.488 / 1.794 / 1.849** Evolución indicador / (2015=100) / 100 / 99 / 98 / 96 / 94 / 68 / 82 / 85

B-3.2: Indicator metadata	
Indicator Title	**EVOLUTION OF THE MOBILITY OF PRIVATE CARS**
Identification number	3.1.2
Unit of measurement	Millions of vehicles x km / year.
Definition	- The data concerning the analysis of modal shifts in the road traffic sector. - The expected trend is downward, although this is an informative indicator that has to be assessed in conjunction with other indicators in the sector.
Calculation Formula	- Ratio of annual private car journeys in thousands of vehicles per km/year, divided by 1,000.
Is the indicator captured by existing CDP/SCIS/CoM platforms?	SÍ: (3.5) Report your jurisdiction's passenger and/or freight mode share data. Passenger mode share: Private motorized transport
Planned data source	Emission inventory, with data from the Traffic Model and the Vehicle Fleet Study.
Planned availability	Annual
Planned collection interval	2015-2030
Results describing the indicator	Variable / Unidades / 2015 / 2016 / 2017 / 2018 / 2019 / 2020 / 2021 **Valor / Millones de veh*km / año / 12.327 / 12.290 / 12.443 / 12.249 / 12.121 / 8.950 / 9.920** Evolución / (2015=100) / 100 / 100 / 101 / 99 / 98 / 73 / 80

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B-3.2: Indicator metadata	
Indicator Title	**EVOLUTION OF PEDESTRIAN MOBILITY**
Identification number	3.2.1
Unit of measurement	Thousands of people / day.
Definition	- This indicator reports on the degree of preference for pedestrian circulation. - The series starts in 2019, the year in which the pedestrian mobility sampling points were put into operation. - Expected trend: increasing.
Calculation Formula	- The total average number of pedestrians per weekdays, Saturdays and Sundays and public holidays along the year are reported.
Is the indicator captured by existing CDP/SCIS/CoM platforms?	Yes, partially considered. (3.5) Report your jurisdiction's passenger and/or freight mode share data. Passenger mode share: Walking
Planned data source	Madrid City Council's Open Data Portal Madrid City Council Transparency Portal Mobility 2022 Report
Planned availability	Annual
Planned collection interval	2015-2030
Results describing the indicator	

Variable	Unidades	2015	2016	2017	2018	2019	2020
Valor	**Miles de Personas/día**	**0**	**0**	**0**	**0**	**2.194**	**1.370**
Evolución	(2019=100)*	0	0	0	0	100	62
Valor	**Miles de Personas/día**	**0**	**0**	**0**	**0**	**3.041**	**1.792**
Evolución	(2019=100)*	0	0	0	0	100	59
Valor	**Miles de Personas/día**	**0**	**0**	**0**	**0**	**2.604**	**1.553**
Evolución	(2019=100)*	0	0	0	0	100	60

B-3.2: Indicator metadata	
Indicator Title	**DEVELOPMENTS IN PUBLIC TRANSPORT MOBILITY**
Identification number	3.2.2
Unit of measurement	Millions of users / year.
Definition	- Users of the main public transport services available (metro, suburban and EMT buses) have been grouped together to enable analysis of the evolution of transport sustainability. - Expected trend: increasing.
Calculation Formula	- Total number of users/year, EMT, Metro and Renfe, divided by one million.
Is the indicator captured by existing CDP/SCIS/CoM platforms?	Yes, partially considerd: (3.5) Report your jurisdiction's passenger and/or freight mode share data. Passenger mode share: Rail/Metro/Tram

	Passenger mode share: Buses (including Bus Rapid Transit)
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
Results describing the indicator	Evolución de la movilidad en el transporte público **Variables** / **Unidades** / **2015** / **2016** / **2017** / **2018** / **2019** / **2020** / **2021** / **2022** Movilidad EMT / Nº de usuarios /año / 405.923.000 / 430.109.000 / 427.931.000 / 420.197.000 / 439.787.000 / 241.561.000 / 296.500.000 / 372.900.000 Movilidad Metro / Nº de usuarios /año / 575.973.000 / 586.032.000 / 631.660.000 / 662.882.000 / 683.336.000 / 352.568.000 / 442.300.000 / 571.700.000 Movilidad Renfe / Nº de usuarios /año / 157.140.110 / 160.079.031 / 166.287.535 / 175.760.009 / 171.912.087 / 109.400.000 / 127.600.000 / 166.700.000 **Indicador** / **Nº de usuarios (millones) / año** / **1.139** / **1.176** / **1.226** / **1.259** / **1.295** / **704** / **866** / **1.111** Evolución indicador / (2015=100) / 100 / 103 / 108 / 111 / 114 / 62 / 76 / 98

B-3.2: Indicator metadata	
Indicator Title	**ANNUAL EMISSIONS FROM LIGHT AND HEAVY DUTY VEHICLES**
Identification number	0.0.2
Unit of measurement	Kt CO2eq [Kilotonnes of CO2 equivalent]
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.
Calculation Formula	- 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).
Is the indicator captured by existing CDP/SCIS/CoM 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
Planned data source	Vehicle fleet study / emissions inventory.
Planned availability	Biennal / Annual
Planned collection interval	2017-2030
Results describing the indicator	*Emisiones anuales GEI (V.L y V.P).* / *Año* / 2017 / 2018 / 2019 / 2020 / 2021 / 2022 / 2024 *Vehículos Ligeros (N1)* / *KtCO2* / *219,13* / *243,46* / *238,33* / *175,53* / *261,64* / *257,99* / *246,20* *Vehículos Pesados (N2 y N3)* / KtCO2 / *123,21* / *136,65* / *133,81* / *98,91* / *81,83* / *81,49* / *83,23*

B-3.2: Indicator metadata	
Indicator Title	**TOTAL GHG EMISSIONS IN THE ROAD TRANSPORT SECTOR**
Identification number	1.3.1

Unit of measurement	Kt CO2eq [Kilotonnes of CO2 equivalent]
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 Formula	- It is obtained by taking the value of total greenhouse gas emissions, in the Road Transport column.
Is the indicator captured by existing CDP/SCIS/CoM platforms?	Yes: (2.1d) Provide a breakdown of your community-wide emissions in the format of the Common Reporting Framework.
Planned data source	Inventory of Madrid City Greenhouse Gas Emissions (2024 update, year 2022).
Planned availability	Annual
Planned collection interval	2015-2030
Results describing the indicator	Tabla 10. City Greenhouse Gas Emissions by sector

Emisiones	RCI	Industria*	Transporte por carretera	Otros modos de transporte	Tratamiento y eliminación de residuos**	Otros***	TOTAL
			kt CO_2 eq				
Directas	1.790,2	443,0	1.924,4	702,8	665,7	382,2	**5.908,4**
Indirectas	2.044,7	113,8	3,3	229,0	7,1	0,0	**2.397,9**
TOTALES	3.834,9	556,7	1.927,7	931,9	672,9	382,2	**8.306,3**
			Contribución por sectores (%)				
Directas	30,3	7,5	32,6	11,9	11,3	6,5	**100**
Indirectas	85,3	4,7	0,1	9,6	0,0	0,3	**100**
TOTALES	46,2	6,7	23,2	11,2	8,0	4,7	**100**

(*) Incluye las emisiones industriales derivadas o no de procesos de combustión (grupos SNAP 03 y 04)
(**) Incluye tratamiento de residuos y tratamiento de aguas residuales
(***) Incluye la extracción y distribución de combustibles fósiles, el uso de disolventes y otros productos, la agricultura y la naturaleza (exceptuando las absorciones de CO_2 por parte de los sumideros)

B-3.2: Indicator metadata	
Indicator Title	**RELATIVE GROWTH OF ZERO PASSENGER CAR REGISTRATIONS**
Identification number	3.3.1
Unit of measurement	Percentage (%).
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.
Calculation Formula	- 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.
Is the indicator captured by existing CDP/SCIS/CoM platforms?	Yes: (3.6) Report the total emissions, fleet size and number of vehicle types for the following modes of transport.
Planned data source	DGT Statistical Tables - Registrations (Provincial data)
Planned availability	Annual
Planned collection interval	2015-2030

Results describing the indicator	

Variable	Unidades	2015	2016	2017	2018	2019	2020	2021
Valor	%	0	0	1	1	2	6	9
Evolución	(2017=100)	0	0	100	157	258	737	1.059

B-3.2: Indicator metadata	
Indicator Title	**RELATIVE GROWTH OF ZERO TAXIS REGISTRATION**
Identification number	3.3.2
Unit of measurement	Percentage (%).
Definition	- The ratio of ZERO taxis to the total fleet in the municipality. - Expected trend: increasing.
Calculation Formula	- Number of ZERO taxi vehicles in a year multiplied by one hundred and divided by the total number of taxi vehicles in a year.
Is the indicator captured by existing CDP/SCIS/CoM platforms?	Yes: (3.6) Report the total emissions, fleet size and number of vehicle types for the following modes of transport.
Planned data source	Madrid City Council's Open Data Portal Daily and historical taxi fleet
Planned availability	Annual
Planned collection interval	2015-2030
Results describing the indicator	

Variables	Unidades	2015	2016	2017	2018	2019	2020	2021	2022
Taxis CERO	Nº de vehículos	0	0	2	11	23	35	126	304
Total taxis	Nº de vehículos	-	-	12.562	14.153	16.614	15.528	15.106	15.353
Indicador	%	0,00	0,00	0,02	0,08	0,14	0,23	0,83	1,98
Evolución indicador	(2017=100)	0	0	100	488	870	1.416	5.239	12.437

B-3.2: Indicator metadata	
Indicator Title	**EVOLUTION OF ZERO BUSES COMPARED TO TOTAL BUSES (EMT)**
Identification number	3.3.3
Unit of measurement	Percentage (%).
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.
Calculation Formula	- Number of ZERO bus vehicles (EMT) in a year multiplied by one hundred, and divided by the total number of bus vehicles (EMT) in a year.
Is the indicator captured by existing	Yes: (3.6) Report the total emissions, fleet size and number of vehicle types for the following modes of transport.

CDP/SCIS/CoM platforms?	
Planned data source	EMT Report - Bus fleet
Planned availability	Annual
Planned collection interval	2015-2030
Results describing the indicator	

Variables	Unidades	2015	2016	2017	2018	2019	2020	2021
Autobuses CERO	Nº de vehículos	0	28	32	48	65	75	130
Total autobuses	Nº de vehículos	-	1.967	2.184	2.408	2.312	2.182	2.095
Indicador	**%**	**0,00**	**1,42**	**1,47**	**1,99**	**2,81**	**3,44**	**6,21**
Evolución indicador	(2016=100)	0	100	103	140	198	241	436

B-3.2: Indicator metadata	
Indicator Title	**RELATIVE GROWTH OF ELECTRIC FREIGHT TRANSPORT REGISTRATIONS**
Identification number	3.3.4
Unit of measurement	Percentage (%).
Definition	- It shows the proportion of fully electric freight vehicles (light and heavy, separately) in a year. - Expected trend: increasing.
Calculation Formula	- Number of ZERO freight vehicles, whether Light (N1) or Heavy (N2 and N3) in a year multiplied by one hundred, divided by the total number of freight vehicles in that year.
Is the indicator captured by existing CDP/SCIS/CoM platforms?	Yes: (3.6) Report the total emissions, fleet size and number of vehicle types for the following modes of transport.
Planned data source	Vehicle fleet study
Planned availability	Biennal
Planned collection interval	2017-2030
Results describing the indicator	

Electrificación de Mercancías	*Año*	2017	2022	2024
Vehículos Ligeros (N1)	*Valor %*	*0,14*	*1,05*	*1,72*
Vehículos Pesados (N2 y N3)	Valor %	*0,00*	*0,00*	*0,75*

B-3.2: Indicator metadata	
Indicator Title	**EVOLUTION OF THE RECOVERY RATE IN RESIDENTIAL, SERVICES AND MUNICIPAL SECTORS**
Identification number	5.2.1

Unit of measurement	Percentage (%).
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.
Calculation Formula	- 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.
Is the indicator captured by existing CDP/SCIS/CoM platforms?	Yes, partially considered: (3.7) Report the following waste-related data for your jurisdiction.
Planned data source	Activity reports of the Valdemingómez Technology Park. Year 2022 [Calculations available in "Auxiliary_calculations"]
Planned availability	Annual
Planned collection interval	2015-2030
Results describing the indicator	

Variable	Unidades	2015	2016	2017	2018	2019	2020	2021	2022
Valor	%	7,10	7,03	7,17	7,96	8,35	7,62	8,65	8,96
Evolución	(2015=100)	100	99	101	112	118	107	122	126

B-3.2: Indicator metadata	
Indicator Title	**EVOLUTION OF THE TOTAL MASS OF BIO-WASTE COLLECTED SEPARATELY**
Identification number	5.3.1
Unit of measurement	Tons.
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. - Expected trend: increasing.
Calculation Formula	- It is taken from Activity reports of the Valdemingómez Technology Park [Bio-waste fraction row]. For the relative evolution, the first non-zero data in the series, which occurs in 2017, is considered.
Is the indicator captured by existing CDP/SCIS/CoM platforms?	Yes, partially considered: (3.7) Report the following waste-related data for your jurisdiction.

Planned data source	Activity reports of the Valdemingómez Technology Park. Year 2022.
Planned availability	Annual
Planned collection interval	2015-2030
Results describing the indicator	

Variable	Unidades	2015	2016	2017	2018	2019	2020	2021	2022
Indicador	t/año	0	0	2.089	37.545	127.777	194.634	215.485	228.547
Evolución	(2017=100)*	-	-	100	1.797	6.117	9.317	10.315	10.940

B-3.2: Indicator metadata	
Indicator Title	**EVOLUTION OF CO2 REMOVALS (SINKS)**
Identification number	1.6.1
Unit of measurement	Kt CO2eq [Kilotonnes of CO2 equivalent]
Definition	- Absorptions by CO2 sinks. - Expected trend: a mantenerse o ligeramente increasing.
Calculation Formula	- Obtained from the Absorptions column in table 56 of the Inventory of greenhouse gas emissions in the municipality of Madrid. Year 2022.
Is the indicator captured by existing CDP/SCIS/CoM platforms?	Yes: (2.1d) Provide a breakdown of your community-wide emissions in the format of the Common Reporting Framework.
Planned data source	Inventory of Madrid City Greenhouse Gas Emissions (2024 update, year 2022).
Planned availability	Annual
Planned collection interval	2015-2030
Results describing the indicator	

Variables	Unidades	2015	2016	2017	2018	2019	2020	2021	2022
Indicador	kt CO_2	43,3	43,8	43,8	39,6	39,6	39,6	39,6	39,6
Evolución indicador	(2015=100)	100	101	101	91	91	91	91	91

B-3.2: Indicator metadata	
Indicator Title	**TOTAL GHG EMISSIONS IN THE RESIDENTIAL SECTOR**
Identification number	1.2.1
Unit of measurement	Kt CO2eq [Kilotonnes of CO2 equivalent]
Definition	- 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 disaggregation of emissions provides insight into the evolution of each sector. - Los GEI contabilizados son los siguientes: CH4, CO2, HFC, N2O, PFC y SF6. - Expected trend: downward.
Calculation Formula	- 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.
Is the indicator captured by existing CDP/SCIS/CoM platforms?	Yes: CDP 2022: Emissions Inventory Data (2.1d)
Planned data source	Inventory of Madrid City Greenhouse Gas Emissions (2024 update, year 2022).
Planned availability	Annual
Planned collection interval	2015-2030
Results describing the indicator	

Variables	Unidades	2015	2016	2017	2018	2019	2020	2021	2022
Indicador	kt CO_2eq	2.958	2.796	2.840	2.899	2.495	2.191	2.103	2.242
Evolución indicador	(2015=100)	100	95	96	98	84	74	71	76

B-3.2: Indicator metadata	
Indicator Title	**TOTAL GHG EMISSIONS IN THE SERVICES SECTOR**
Identification number	1.4.1
Unit of measurement	Kt CO2eq [Kilotonnes of CO2 equivalent]
Definition	- 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 disaggregation of emissions provides insight into the evolution of each sector. - Los GEI contabilizados son los siguientes: CH4, CO2, HFC, N2O, PFC y SF6. - Expected trend: downward.
Calculation Formula	- 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 the sum of Scope 2 emissions for electricity generation and Scope 3 emissions from electricity transmission losses.
Is the indicator captured by existing CDP/SCIS/CoM platforms?	Yes: CDP 2022: Emissions Inventory Data (2.1d)
Planned data source	Inventory of Madrid City Greenhouse Gas Emissions (2024 update, year 2022).
Planned availability	Annual
Planned collection interval	2015-2030
Results describing the indicator	

Variables	Unidades	2015	2016	2017	2018	2019	2020	2021	2022
Indicador	kt CO_2eq	2.862	2.471	2.678	2.716	2.176	1.624	1.545	1.978
Evolución indicador	(2015=100)	100	86	94	95	76	57	54	69

B-3.2: Indicator metadata	
Indicator Title	**EVOLUTION OF THE NUMBER OF REHABILITATED DWELLINGS**

Identification number	2.1.1
Unit of measurement	Frecuencia absoluta anual (nº de viviendas)
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 - Expected trend: increasing.
Calculation Formula	- Number of dwellings rehabilitated annually, within the scope of the Rehabilita Madrid Plan.
Is the indicator captured by existing CDP/SCIS/CoM platforms?	Yes: paragraph 9, mitigation actions. Primary emissions sector addressed and action type - Stationary Energy efficiency/ retrofit measures addressing existing commercial, residential and/or municipal buildings
Planned data source	Madrid City Council, AG Urban Development.
Planned availability	Annual
Planned collection interval	2019-2030
Results describing the indicator	PENDING RECEIPT OF DATA

B-3.2: Indicator metadata	
Indicator Title	**EVOLUTION OF REHABILITATED SURFACE AREA**
Identification number	2.1.2
Unit of measurement	Surface, m2
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 - Expected trend: increasing.
Calculation Formula	- Total number of rehabilitated housing areas annually, within the scope of the Rehabilita Madrid Plan.
Is the indicator captured by existing CDP/SCIS/CoM 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
Planned data source	Madrid City Council, AG Urban Development.
Planned availability	Annual
Planned collection interval	2019-2030
Results describing the indicator	PENDING RECEIPT OF DATA

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B-3.2: Indicator metadata	
Indicator Title	**EVOLUTION OF THE NUMBER OF COAL-FIRED BOILERS**
Identification number	2.2.1
Unit of measurement	Number of installations
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
Calculation Formula	- Total annual number of reductions in coal-fired boiler installations, within the scope of the *Rehabilita Madrid Plan*.
Is the indicator captured by existing CDP/SCIS/CoM 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. 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.
Planned data source	Emission Inventory - Coal-fired boilers census
Planned availability	Annual
Planned collection interval	2015-2030
Results describing the indicator	

Variables	Unidades	2015	2016	2017	2018	2019	2020	2021
Calderas de carbón	Nº de instalaciones	482	438	394	353	316	283	142
Indicador	**Nº de instalaciones**	**482**	**438**	**394**	**353**	**316**	**283**	**142**
Evolución indicador	(2015=100)	100	91	82	73	66	59	29

B-3.2: Indicator metadata	
Indicator Title	**FINAL ENERGY CONSUMPTION IN RCI**
Identification number	0.0.1
Unit of measurement	Ktoe [kilotonnes of oil equivalent]
Definition	- Final energy consumption in the municipality of Madrid in the residential and services sectors. - Expected trend: downward.
Calculation Formula	- Sum of all energy products consumed in the residential and services sectors in the city of Madrid in 2022.

Is the indicator captured by existing CDP/SCIS/CoM 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.
Planned data source	Energy balance of the municipality of Madrid (2024 update, year 2022).
Planned availability	Annual
Planned collection interval	2006-2030
Results describing the indicator	

Año	RCI	
	ktep	%
2006	1.967,16	51,08
2007	2.011,98	51,28
2008	2.055,40	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	1.945,90	55,53
2019	1.852,78	54,34
2020	1.718,59	60,73
2021	1.679,67	56,23
2022	1.595,49	52,78

B-3.2: Indicator metadata	
Indicator Title	**CONTRIBUTION OF ELECTRICITY TO TOTAL FINAL ENERGY CONSUMPTION (RESIDENTIAL AND SERVICES SECTORS)**
Identification number	2.2.3
Unit of measurement	Percentage (%)
Definition	- It is an indicator of the degree of electrification of residential and services sectors and how this energy source can replace the final consumption of fossil energy sources. - Expected trend: increasing.
Calculation Formula	- It is determined as the electricity consumption of the RCI sector (residential, commercial and institutional) for the year of study, in terms of percentage contribution to the total energy consumption of the sector.
Is the indicator captured by existing CDP/SCIS/CoM 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. (3.2) For each type of renewable energy within the jurisdiction boundary, report the installed capacity (MW) and annual generation (MWh).
Planned data source	Energy balance of the municipality of Madrid (2024 update, year 2022).
Planned availability	Annual

Planned collection interval	2015-2030
Results describing the indicator	*Tabla 8. Contribución de cada fuente energética al consumo de energía de cada sector (%). Año 2022* nd = desagregación no disponible

	Residencial	Servicios	RCI	Industria	Transporte rodado	Otros modos de transporte	Tratamiento de residuos urbanos	Tratamiento de aguas residuales	TOTAL
Biomasa	-	-	0,56	0,00	0,00	0,00	0,00	0,00	0,30
Gas natural[7]	22,56	13,41	35,97	73,21	8,13	0,00	0,00	44,46	26,40
PP	-	-	8,63	2,24	88,60	71,32	3,74	0,00	38,11
GLP	-	-	2,41	0,49	1,95	0,00	3,74	0,00	1,87
Gasolinas	0,00	0,00	0,00	0,00	30,35	0,00	0,00	0,00	8,75
Gasóleo A	0,00	0,00	0,00	0,00	54,06	0,00	0,00	0,00	15,58
Gasóleo B	0,00	0,00	0,00	0,00	0,00	12,40	0,00	0,00	1,37
Gasóleo C	-	-	6,22	1,47	0,00	0,00	0,00	0,00	3,38
Fuelóleo	0,00	0,00	0,00	0,29	0,00	0,00	0,00	0,00	0,02
Queroseno	0,00	0,00	0,00	0,00	0,00	58,91	0,00	0,00	6,50
ETBE	0,00	0,00	0,00	0,00	1,44	0,00	0,00	0,00	0,41
MTBE	0,00	0,00	0,00	0,00	0,80	0,00	0,00	0,00	0,23
Biocarburantes	0,00	0,00	0,00	0,00	3,11	0,00	0,00	0,00	0,90
Biodiesel	0,00	0,00	0,00	0,00	3,11	0,00	0,00	0,00	0,90
Bioetanol	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Electricidad	-	-	53,51	24,55	0,16	28,68	96,26	55,54	33,59
Electricidad (red)	21,92	31,57	53,49	23,91	0,16	28,68	0,00	16,79	33,11
Autoconsumos en generadores	-	-	0,03	0,63	0,00	0,00	96,26	38,74	0,49
Carbón	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Solar térmica	0,88	0,21	1,09	0,00	0,00	0,00	0,00	0,00	0,57
Geotérmica	0,21	0,03	0,25	0,00	0,00	0,00	0,00	0,00	0,13
Hidrógeno	-	-	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TOTAL	-	-	100,00	100,00	100,00	100,00	100,00	100,00	100,00%

B-3.2: Indicator metadata	
Indicator Title	**AVERAGE HOUSEHOLD INCOME**
Identification number	7.2.1
Unit of measurement	Eur. / year.
Definition	- It allows us to determine the average income level per household (called Renta Media por Hogar), while also comparatively assessing the social dimension of the collective effort to reduce GHG. - Expected trend: increasing.
Calculation Formula	- Added individual average income per household.
Is the indicator captured by existing CDP/SCIS/CoM platforms?	NO
Planned data source	INE: Atlas de Distribución de Renta de los Hogares (resultados por municipio)
Planned availability	Annual
Planned collection interval	2019 - 2030
Results describing the indicator	

Año	2019	2020	2021	2022
Valor	*43.393*	*43.003*	*43.953*	*46.651*

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). Estas intervenciones también abordan las oportunidades, brechas y barreras identificadas en los Módulos A-2 y A-3.

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). These interventions also address the identified opportunities, gaps and barriers identified Module A-2 and A-3.

C-1.1: ORGANISATIONAL AND GOVERNANCE INTERVENTIONS					
Name of the performance	**Description**	**Person and entity/body responsible**	**Actors involved**	**Impact**	**Cobenefits**
Interdepartmental 'Grupo Clima'	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
CitiES2030: Collaborative Platform for Climate Neutrality in Spanish Cities		Ministerio para la Transición Ecológica y el Reto Demográfico of the Spanish Government, with the management support of EIT Climate-KIC (in collaboration	The City Councils of Barcelona, Seville, Valencia, Valladolid, Vitoria-Gasteiz and Zaragoza, the Ministerio para la Transición Ecológica y el	The aim is to accelerate the implementation of solutions with social, economic and environmental impact, bringing together public and private efforts for	Design and implementation of simultaneous actions in several Spanish cities (multi-city projects) that amplify the scale of the initiatives. Opportunities for inter-city

		with Universidad Politécnica de Madrid - UPM)	Reto Demográfico, EIT Climate-KIC, UPM, Fundación Biodiversidad, la Oficina Española de Cambio Climático, and the European project NetZeroCities for the operationalisation of the European Cities Mission	urban transformation	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 Climate Network)	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
Chamartín Business Centre Climate Action Demonstrator Area (called ADAC – *Área Demostradora de Acción Climática*)	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
Área Demostradora de Acción Climática 'ADAC 360 Vallecas'	Action Plan to accelerate climate neutrality, urban regeneration and naturalization in the scope between the A-3, the M-40, the railway network and Avenida de	Madrid City Council. Directorate of Sustainability and Environmental Control	Management bodies (some in the process of being established) mainly associated with the plots called 'Tubos Borondo', 'Santa Luisa' and 'Subestación	It will give rise to a new urban centrality. The urban planning of public space in this area will be adjusted to bioclimatic parameters and the buildings will comply with	Solve the deterioration of the area and its problems of accessibility, permeability and communication between the different areas of its environment

	la Albufera (the confluence of the Puente de Vallecas and Villa de Vallecas districts)		Vallecas', as well as the areas 'Campus Sur' and 'Hospital Infanta Leonor'	low-emission and passive architecture criteria	

C-1.2: DESCRIPCIÓN DE LAS INTERVENCIONES DE ORGANIZACIÓN Y GOBERNANZA

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 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).

C-2.1: SOCIAL INNOVATION AND OTHER INTERVENTIONS					
Name of the performance	**Description**	**Person and entity/body responsible**	**Actors involved**	**Impact**	**Co-benefits**
Instituto Mutante de Narrativas Ambientales	Alliance between the Madrid City Council (Environment and Mobility Area), the public centre for contemporary creation Matadero-Madrid and Universidad Politécnica de Madrid to create an artistic laboratory for the climate in 2018	Matadero-Madrid	Madrid City Council (Environment and Mobility Area), Matadero-Madrid and Universidad Politécnica de 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 Madrid by 2050	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
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	Madrid City Council	Allied partners in each project (other public administrations with competences in each field, companies,	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

	infrastructures and public space and the design of indicators that specifically measure climate impact		educational communities)		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, Universidad Politécnica de 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 Programme (inter-area)	Action in 218 schools (primary and secondary) in the 21 districts of the city to adapt them to climate change until 2023.	Madrid City Council (various government departments involved)	School communities of the schools (in the pilot actions), companies carrying out the work	Increased road safety on access roads to 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).	Satisfaction of the populations living in the areas of action. Experimentation that can provide lessons for other experiments in other areas of the city and for other cities.
Open events “Compromiso por el clima”	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	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

			EIT Climate-KIC and more than 50 speakers		
TÁNDEM Project	Pilot program to promote a fair and economically viable transition in built environments. Of particular note is 'EmpéaTe Verde' with people in vulnerable situations	Madrid City Council ECODES [Fundación Ecología y Desarrollo]	SEPE [Servicio Público de Empleo Estatal] ITD UPM - Plataforma por el Empleo y el emprendimiento verde	Retraining and support for green jobs. Climate change adaptation, connecting with the municipality's climate strategy. Improving energy efficiency	Energy advisory services for citizens and sustainable renovations carried out in public spaces

C.2.2: 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.

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).

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MODULE C-3

Financing of Action Portfolio (Economic Case)

It is shown below 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, with the hypotheses established in the Economic Model and the costs related to carrying them out.

The following table shows the data relating to the initial study carried out in the first version of the Madrid Climate City Contract, taking 2019 as a baseline:

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*	*2020-2030*	*Buildings and Heating and Cooling*	*23*	*€ 263*	*€ 20*	*-409 €*

		highest energy efficiency standards						
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 €***

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**			**Impact**	

MADRID

			Start and end date	Scope of action	GHG reduction (kt CO2e)	Operational cost savings (MEUR - NPV 2020-2050)	co-benefits (MEUR - NPV 2020-2050)	Estimated total cost
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%*	*2020-2030*	*Buildings and Heating and Cooling*	*345*	*€ 4.255*	*€ 31*	*-1.951 €*

		efficiency improvements)						
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 €***

Outlook and next steps

This section includes 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.

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 over the course of the year, with a maximum deadline of 2 years after this iteration (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