



CLIMATE AND ENERGY PLAN 2030

THE PATH TOWARDS A MORE SELF-SUFFICIENT, RESILIENT AND EMISSION-NEUTRAL METROPOLIS





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INTRODUCTION BY THE VICE-PRESIDENT OF THE ENVIRONMENT

In 2015, as a result of the United Nations Climate Change Conference in Paris, the AMB joined the global commitment to keep the planet's increase in temperature by the end of the century to 1.5°C. We therefore approved the first AMB Climate Declaration which established the commitment to implement climate mitigation and adaptation strategies in such a densely inhabited and developed region as the metropolitan area of Barcelona.

Great social and economic changes tend to occur in metropolitan areas and we therefore have a huge responsibility. The effects of climate change, such as heatwaves, droughts, etc. will also affect us directly and even impact our health.

It's time for change and we must form part of the "climate revolution". And we mean just that, a "revolution", because it must be a rapid change which involves all of us, to a greater or lesser extent. Not only do we have to reduce our emissions but also think about how we can become more resilient and adapt to a future that will surely be different.

The **AMB Climate and Energy Plan 2030** is our roadmap for climate change and energy transition with a view to 2030.

It is a "plan of plans", including three strategies used by the AMB for several years now to combat climate change: Carbon Management Strategy, Roadmap for Energy Transition and the Climate Change Adaptation Plan.



CLIMATE AND ENERGY PLAN 2030



CARBON AND ENERGY MANAGEMENT STRATEGY 2030



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The Climate and Energy Plan aligns the different metropolitan policies implemented recently with previous initiatives (AMB Sustainability Plan, Climate Declaration) and represents a more ambitious approach by the whole of the AMB to address the commitments of the Climate Change Conference in order to make the metropolitan area more carbon-neutral via a genuine energy transition.

With all local administrations joining forces, the Plan will allow us to reduce emissions in 2030 by 40% and will also represent true energy transition, promoting the production of local, renewable energy to ensure greater self-sufficiency.

This entails a commitment to sustainable mobility that significantly reduces (30%) CO₂ emissions, a goal that must be contained in the AMB Metropolitan Mobility Plan (currently being drawn up).

It also requires involvement across the board from the different areas of AMB and the metropolitan municipalities in the generation of renewable energy, the reconditioning of housing and also in the industrial estate programme, as well as the development of municipal initiatives with the support of the metropolitan energy operator.

Similarly, in the area of water supply, commitment is required to planning that guarantees the availability of alternative water resources during the droughts we will have to face over the coming years in order to reduce our dependence on the River Ter, which will also be locally affected by global changes.

On the other hand, the increase in temperature and the number of very hot days will result in an adaptation of residential housing and associated consumption.

Finally, now that we realise that biodiversity helps us to become more resilient and provides us with a better quality of life, the green and blue infrastructure must form a part of today's urban development, an aspect that needs to be tackled by the AMB Main Urban Development Plan.

The Climate and Energy Plan 2030 includes actions from other AMB plans, focuses on climate change and climate-related impacts on our region and establishes a roadmap for an energy transition and lower dependence on fossil fuels.

A total of 92 actions for a metropolitan region and institution committed to combating climate change.

Eloi Badia Casas

Vice-President of the Environment, AMB



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Climate change is a global phenomenon and one of the biggest challenges of the 21st century which must be tackled, and quickly. The fifth report by the IPCC (Intergovernmental Panel on Climate Change) states that the planet is definitely getting warmer, as shown by the increase in the global mean temperature of the atmosphere and ocean, the widespread melting of snow and ice and rising sea levels.

Given this situation, international organisations have responded quickly and different administrations have reacted by adopting measures and commitments in order to reduce greenhouse gas (GHG) emissions and adapt to any irreversible effects.

The Paris Agreement signed during the COP21 in 2015 represented a historic watershed in terms of targets to reduce GHG emissions. One of the most notable targets is to limit the rise in global temperature to below 2°C, and attempting to keep this at 1.5°C due to the irrevocable risks entailed. However, we urgently need to define how to achieve this global target and without delay.

The European Union (EU) ratified the Paris Agreement in November 2016 and is acting as leader in policies for energy transition and climate change, establishing 3 key goals for 2030; namely:

At least 40% reduction in GHG emissions compared with 1990

At least 30% of the energy consumed must come from renewable sources

At least 30% improvement in energy efficiency



* EU Emissions Trading System (EU-ETS).
https://ec.europa.eu/clima/policies/ets_en.

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In Catalonia, the parliament very recently passed Climate Change Act 16/2017 (Llei de Canvi Climàtic) on 1 August, whose aim is to reduce Catalonia's GHG emissions by 40% by 2030, as well as encouraging a shift towards a low-carbon economy, among other goals.

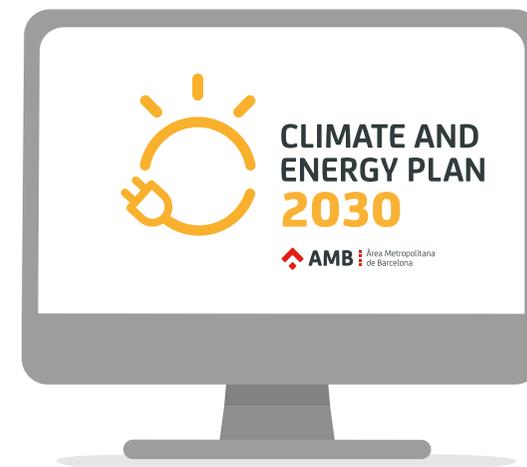
Approximately half the world's population lives in cities which generate around 70% of all GHG emissions. The Barcelona Metropolitan Area (AMB) is the government responsible for the metropolitan area of Barcelona which covers 636 km². It is made up of 36 municipalities with over 3.2 million inhabitants and represents a geographical, social, demographic, economic and cultural area that has been gradually created over the last century as a result of the growth in and connection between the different urban systems in and around the city of Barcelona. It is the largest metropolitan agglomeration in the western Mediterranean and is responsible for half of Catalonia's GDP. It therefore plays a significant role in developing solutions and implementing measures to combat climate change.

Article 14 of Chapter I of Act 31/2010, constituting the Barcelona Metropolitan Area, regulates, among other matters, the authority to formulate measures to combat climate change. The **AMB Environmental Sustainability Plan** (approved on 28 January 2014) already established some measures related to Aspect 2, Energy and Climate Change, as well as the 2011-2015 Carbon Management Strategy approved by the Metropolitan Council on 5 February 2013, and also the first Climate Change Adaptation Plan, passed on 27 January 2015.

These instruments contain the operational details of the AMB's climate-related commitments:

- **Climate Declaration** (Metropolitan Council, 24 November 2015);
- **Metropolitan Panel for a New Energy Model** (created on 29 April 2015 and formally set up by the Government Assembly of 31 May 2016);
- Coordinating body of the EU's **Global Covenant of Mayors for Climate & Energy** (Metropolitan Council, 26 April 2016).

In 2016, as a result of the points considered after the Paris Agreement, the AMB decided it needed to react quickly and decisively against climate change. This document provides a summary of the complete strategy up to 2030 related to energy transition, the reduction of emissions and adaptation to make the metropolitan area and its people more resilient: the **Climate and Energy Plan 2030**.





CLIMATE AND ENERGY PLAN 2030

The Climate and Energy Plan 2030 contains the metropolitan strategy concerning energy transition and climate change with regard to 2030 in order for the metropolitan area to become progressively more carbon-neutral and take on the goals of energy self-sufficiency, to promote renewable energy sources and savings, reduce GHG emissions and adapt for climate change.

The Climate and Energy Plan is based on a series of **principles which can be found throughout** all the actions included in the Plan:



ACTION BY AREA, BY MUNICIPALITY AND BY INSTITUTION

The measures contained in the Climate and Energy Plan focus on three levels of action: metropolitan, municipal and institutional.



- METROPOLITAN:** actions associated with projects requiring a metropolitan perspective or operation, shared and related to the metropolitan level of authority or with coordinated policies.
- MUNICIPAL:** actions carried out at a municipal level and in collaboration with the councils, involving one or more municipalities.
- INSTITUTIONAL:** actions affecting the AMB institution, including facilities, licensed companies, offices, official vehicles, etc.

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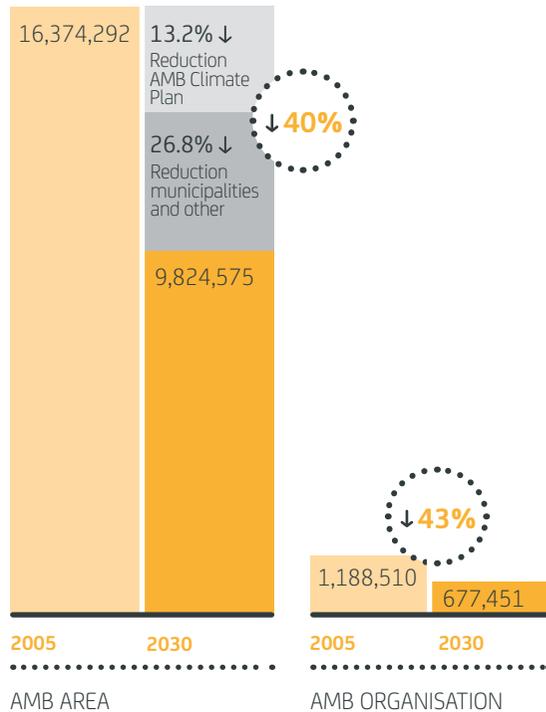
GOALS OF THE CLIMATE AND ENERGY PLAN

The AMB Climate and Energy Plan contains an energy transition strategy for the area in question, as well as a revised carbon management strategy related to the services provided by the AMB. It also contains the adaptation measures required for the metropolitan region to become more resilient to the impact of climate change.

Regarding AMB services (waste treatment, water cycle, mobility, etc.), the Plan establishes a target of reducing emissions by 43% compared with 2005. However, taking into account all the actions planned, both for the region and also regarding the services provided by the AMB, it is estimated that the Plan will help to reduce emissions by 13.2%. Everyone's collaboration is required to achieve the

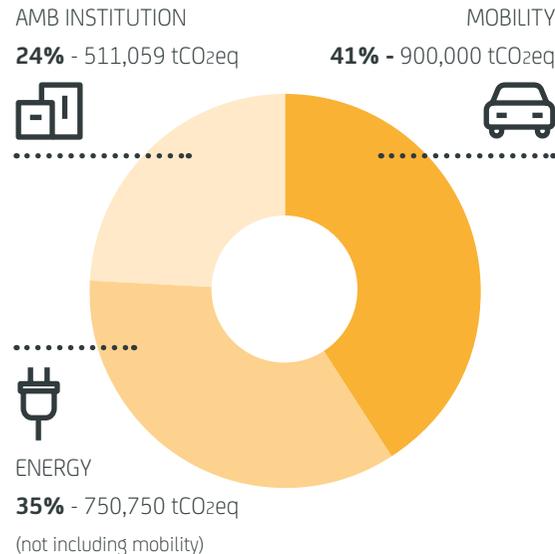
European target of a 40% reduction: councils and other administrations, the main logistics operators, inhabitants, etc.

THE METROPOLITAN AREA: CLOSER TO CARBON-NEUTRAL STATUS

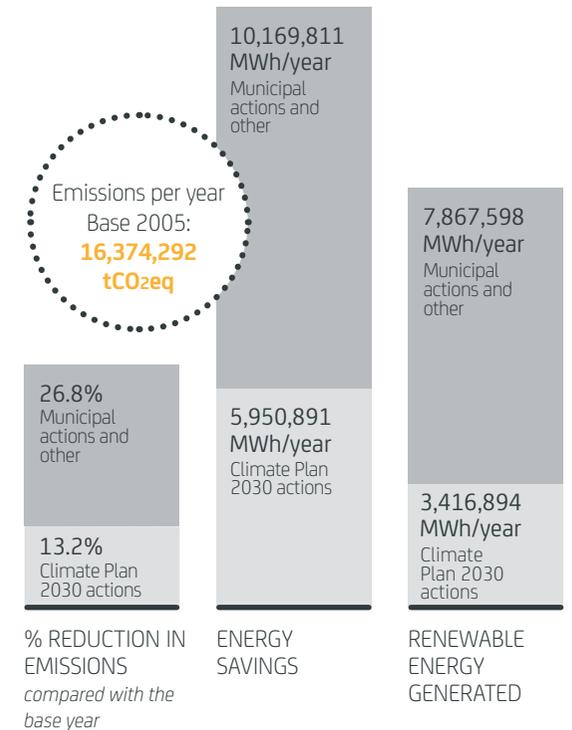


REDUCTION IN EMISSIONS BY SPHERES OF THE CLIMATE AND ENERGY PLAN 2030

13.2% of the emissions reduction by 2030 corresponds to the total of **2,161,809 tCO₂eq** from all the actions in the spheres of:



REDUCTION IN EMISSIONS: AMB ACTIONS + MUNICIPAL ACTIONS





A CARBON AND ENERGY STRATEGY: TOWARDS PROVIDING SERVICES WHILE REDUCING EMISSIONS BY 43% BY 2030 (VS. 2005)

Process of drawing up the Carbon and Energy Strategy:

DIAGNOSIS

- Diagnosis of the global and sector GHG emissions (mobility, water, waste, territory, housing and offices) of the AMB institution and the 57 participating facilities and companies. Calculation of annual emissions, updating of emission factors and analysis of the year-on-year trend.
- Participatory process to improve participants' knowledge of the current obligations regarding mitigation and to boost their commitment.

MAIN OUTCOMES:

- In 2015, the AMB's GHG emissions totalled 858,238 tonnes CO₂-e. Global reduction target: achieved (11% compared with 2011).
- Emissions reduced in all sectors, notably a 17% reduction in the water sector. The sector that contributes most to emissions is waste (67%), followed by transport (19%) and water (13%).
- Commitment by most of the organisations taking part to establish their own roadmap with specific reduction targets and actions.

TARGETS

- Definition of the institution's global targets for 2030 taking into account the previous progression of emission reductions (2011-2015), coherence with other international commitments and the view of the companies involved in the strategy, expressed via a participatory process.

MAIN OUTCOMES:

- 30% reduction in GHGs compared with the base year (2011), equivalent to a 43% reduction compared with 2005 (AMB organisation).
- Establishment of sector targets according to the reduction potential and the lines of action planned by participating companies and facilities.

ACTION PLAN

- Determination of specific actions in the spheres of energy savings and efficiency and the contribution of renewable sources.
- Determination of relative sector-based indicators to reflect the carbon-intensity of processes.

MAIN OUTCOMES:

- 12 specific actions, including the acquisition of electric vehicles for the AMB fleet, renewing machinery to achieve energy savings, implementing a smart system to control and manage fuel consumption and saving paper in the offices, among other measures.
- Creation of a framework for participation and transparency between organisations as a basis to monitor the Strategy and share experiences and good practices.
- Specialist Monitoring Committee for the Strategy: internal mechanism established to present outcomes, report on actions and plan sector targets.

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ENERGY TRANSITION: TOWARDS A REGION WITH 30% RENEWABLE ENERGY SOURCES AND 30% ENERGY EFFICIENCY

Process to produce the Energy Transition Roadmap:

DIAGNOSIS

- Update the AMB's **energy diagnosis**: energy consumption and CO₂ emissions at three levels: metropolitan, municipal and institutional.
- Calculating the AMB's current **energy mix**.
- **Projections** of energy consumption for 2024 and 2030 based on an analysis of socio-demographic and climate factors.

MAIN OUTCOMES:

- **Final energy consumption** in the AMB fell by 23% in the period 2005-2015, from 58,245 GWh per year in 2005 to 44,786 in 2015. The sector consuming the most energy in 2015 was transport (35.8% of total AMB consumption).
- AMB **emissions** fell by 33 % in the period 2005-2015, from 16,374,292 tonnes of CO₂-e in 2005 to 11,049,264 in 2015. 35% of the total AMB emissions are associated with the transport sector. Electricity is the main source of emissions (40.3%), followed by liquid fuels (39.2%).

TARGETS

- Benchmarking national (Catalonia and metropolitan municipalities) and international targets.
- Selecting the base year to gauge target achievement.
- Definition of metropolitan targets for 2030 in terms of renewable energy sources, energy efficiency and CO₂ emissions.

MAIN OUTCOMES:

- At least a 40% reduction in GHGs compared with 2005.
- At least 30% improvement in energy efficiency compared with the projections (BAU scenario - Business As Usual).
- At least 30% of the energy consumed comes from renewable sources.

ACTION PLAN

- Setting up a participatory panel with specialists from the sectors involved.
- Determination of actions in three spheres: renewable energy production, energy efficiency and a new energy culture.
- Association of financing mechanisms in line with each action to ensure they are achieved.

MAIN OUTCOMES:

- The roadmap contains 36 actions to produce energy savings of 5,950,891 MWh/year and 2,094,327 tonnes of CO₂-e; i.e. an 11% reduction in the AMB's energy consumption compared with the BAU scenario defined for 2030 and a 13% reduction in emissions compared with 2005. Additionally, 3,416,894 MWh/year of renewable energy is expected to be produced by 2030, representing 7% of the energy consumption projected for the metropolitan area of Barcelona in 2030 and 331% of the AMB institution's current energy consumption; i.e. 3.3 times higher than the institution's current consumption.
- The budget contribution by the AMB to implement the 36 actions is 5.19%: 0.46% from the ordinary budget of the Metropolitan Energy Agency and 4.73% from the Metropolitan Energy Transition Fund.



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CLIMATE CHANGE ADAPTATION PLAN: A MORE RESILIENT METROPOLIS TO CLIMATE-RELATED IMPACTS

Process of drawing up the Climate Change Adaptation Plan:

CLIMATE-RELATED RISKS



- Identification of the climate-related risks affecting the AMB based on available climate studies and projections.
- Determination of the main climate-related risks affecting the AMB.

MAIN OUTCOMES:

- **5 major climate-related risks or hazards:** increase in consequences resulting from heat, greater likelihood of meteorological droughts, more frequent torrential rainfall and storms with strong winds, changes in seasonal cycles, rising sea levels and increase in incidents due to sea storms.

RESULTING IMPACTS



- Identification of the resulting impacts of the climate-related risks by sector in the AMB.
- Group and individual meetings held with specialists from all the sectors involved to validate the impacts.
- Assessment of the impacts in terms of exposure (degree of impact on the AMB) and resilience (degree of preparation/adaptation of the AMB).

MAIN OUTCOMES:

- **35 impacts** defined as very high or high, for which the AMB is very poorly or poorly prepared/adapted.
- Notable impacts: flooding due to torrential rain, increased energy consumption, affects on infrastructures, limited water resources, impact on beaches due to storms and impact on health due to heatwaves.

ADAPTATION MEASURES



- Determination of adaptation measures based on impacts by sector in the AMB.
- Group and individual meetings held with specialists from all the sectors involved.
- Assessment and prioritisation of actions according to the importance for AMB specialists.

MAIN OUTCOMES:

- 43 adaptation measures established for 7 AMB areas: urban development; public space and infrastructures; building-housing-projects and works; waste; water; environmental education and socioeconomic development.

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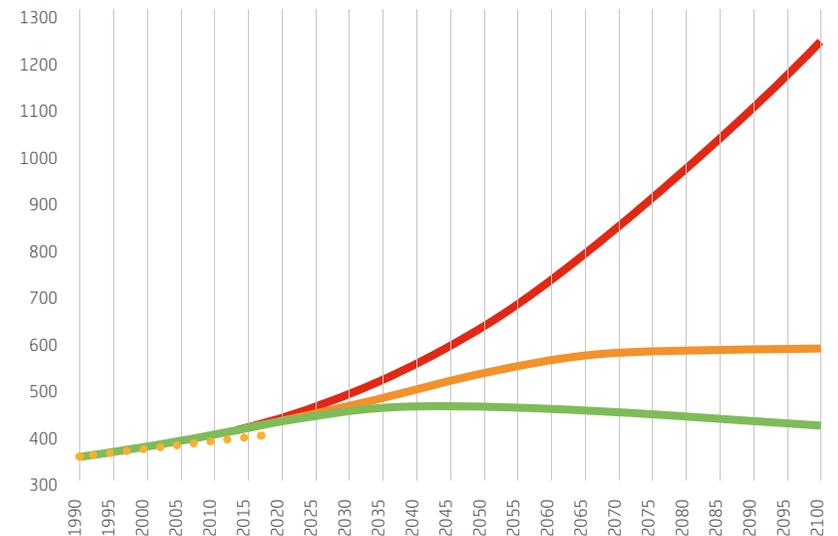
The climate in the AMB is changing and it will continue to change throughout the 21st century. The biggest climate-related threats in this area are higher temperatures, lower annual average rainfall, more extreme weather events, rising sea levels and an increase in impacts due to the heat island effect and heatwaves. Another very significant impact will be the limited water resources expected throughout the metropolitan region due to the reduction at the headwaters of the Ter-Llobregat river system (a result of the lower annual average rainfall, less snow cover and increase in evapotranspiration).

If measures are not taken soon, the average temperature of the metropolitan area of Barcelona may increase 1.5°C and 4°C and its rainfall decrease by 20% by the end of the 21st century, depending on the scenario in question (compared with the period 1971-2000).

The increase in temperature will depend on the future concentration of CO₂ emissions and therefore on the measures applied to reduce these. Three future scenarios have been assumed for emissions concentrations in the AMB: ideal (RCP 2.6), in which measures have been applied to reduce emissions; moderate (RCP 4.5), complying with the 2015 Paris Convention where the CO₂ concentration at the end of the century would be higher than at present, and pessimistic (RCP 8.5), where no targets are achieved and the CO₂ concentrations at the end of the century are much higher than now. The RCP 2.6 scenario is no longer possible as it has been proven that the Paris targets can no longer be achieved. The only viable scenarios are therefore RCP 4.5 and RCP 8.5.

CO₂ CONCENTRATION IN THE ATMOSPHERE BY RCP SCENARIO (1990-2100)

concentration (ppm)



- ● ● ● actual
- without mitigation
- with mitigation as from 2050s ~PARIS
- with mitigation as from 2010s ~KYOTO

Production of regionalised, future climate scenarios with very high resolution (1 km) for the metropolitan area of Barcelona (ESAMB Project)

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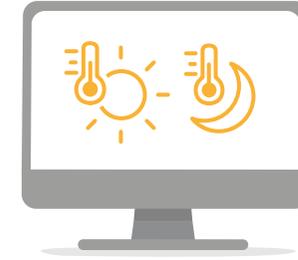
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Changes in climate factors such as temperature, rainfall and rising sea levels will impact the AMB in several ways: heatwaves, floods, drought and more limited water resources and availability, among others.

One of the biggest impacts is the effect of heatwaves. In general, those cities most strongly affected by this factor (and therefore more vulnerable to health-related impacts, such as heatwaves, or those related to energy consumption, especially in summer) are the most densely developed with a higher level of anthropogenic heat (more traffic, combustion, etc.) and with fewer open, green spaces to "soak up" the heat.



VERY HOT DAYS AND NIGHTS SCENARIO RCP 8.5, 2071-2100



BIGGEST RISKS AND IMPACTS IN THE AMB

CLIMATE FACTOR	MAIN RISKS	MAIN IMPACTS
TEMPERATURE	Higher average temperatures, especially during the summer months <i>Annual average T: 15.5°C (current AMB average)</i> <i>Increase according to the different scenarios at the end of the century (2071-2100):</i> <i>+1.9°C (moderate scenario)</i> <i>+3.5-4°C (pessimistic scenario)</i>	Less comfort in housing with worse living conditions and thermal insulation Reduction in thermal comfort and change in energy consumption patterns Impact on the health of more vulnerable people
	Increase in frequency of hot days (Max. T >30°C) and very hot days (Max. T >35°C) and tropical nights (min. T >20°C) and very hot nights (min. T >25°C)	Greater heat island effect
	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Hot days: Current situation: 25.5 days At end of century (2071-2100): +31.9 days (moderate scenario) +58.3 days (pessimistic scenario)</p> </div> <div style="text-align: center;">  <p>Very hot days: Current situation: 2.5 days At end of century (2071-2100): +4.1 days (moderate scenario) +9.8 days (pessimistic scenario)</p> </div> <div style="text-align: center;"> <p>Tropical nights: Current situation: 24.2 nights At end of century (2071-2100): +25.5 nights (moderate scenario) +44.3 nights (pessimistic scenario)</p> </div> <div style="text-align: center;"> <p>Very hot nights: Current situation: 0.3 nights At end of century (2071-2100): +0.6 nights (moderate scenario) +1.3 nights (pessimistic scenario)</p> </div> </div>	Health problems for the most vulnerable people Greater demand for water resources (and less availability of these resources) Risk of increase in smells and faster fermentation of waste





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CLIMATE FACTOR

MAIN RISKS

MAIN IMPACTS



RAINFALL

Large increase in the frequency of dry months: increase in the number of days of meteorological drought

Limited water resources available in the AMB

- Domestic consumption accounts for 69% of the water supplied
- The River Ter contributes almost 50% of the surface water. This contribution will decrease over the coming years, as predicted with the Ter Commitment
- The availability of water resources from the Ter-Llobregat river system will decrease by 23% by mid-century
- Regenerated water could be a key potential resource for future water management given climate change. 260 hm³ of water is processed by treatment plants

Notable rise in the probability of exceptionally rainy months: slight increase in heavy rainfall

Damage to infrastructures caused by heavy rainfall or strong winds or storms

Floods due to heavy rainfall and insufficient drainage capacity in the sewerage and drainage system

Lower rainfall, especially in spring and summer

Increased fire risk in buildings close to woodland

Reduction in water resources and adaptation of the supply system to ensure the water demand can be met

Current annual average rainfall: 602 mm
At end of century, 2071-2100:
no change (moderate scenario)
-19% (pessimistic scenario)

Summer is the season with the largest reduction:
-29% (moderate scenario)
-53% (pessimistic scenario)

Another major impact for the AMB is the effect on infrastructures (ring roads, sewerage system, sanitation, etc.) due to the increase in heavy rainfall.





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CLIMATE FACTOR

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SEA LEVEL

Rise in the sea level and in the incidence of sea storms

Buildings and facilities located on the coast affected by storms and phenomena related to rising sea levels

Changes in wave intensity and direction

Storms and erosion affecting the beaches

The area is densely populated and occupied, making it particularly sensitive to rising sea levels.

By 2100, the sea level along the metropolitan coastline will increase by 0.47 and 1.8 metres depending on the scenario in question.

If no measures are taken and the extreme situation comes about, some beaches could lose 11 m, 21 m and 43 m for the three respective scenarios.

PROJECTED INCREASE IN SEA LEVELS IN THE AMB BY 2100 FOR THREE FUTURE SCENARIOS



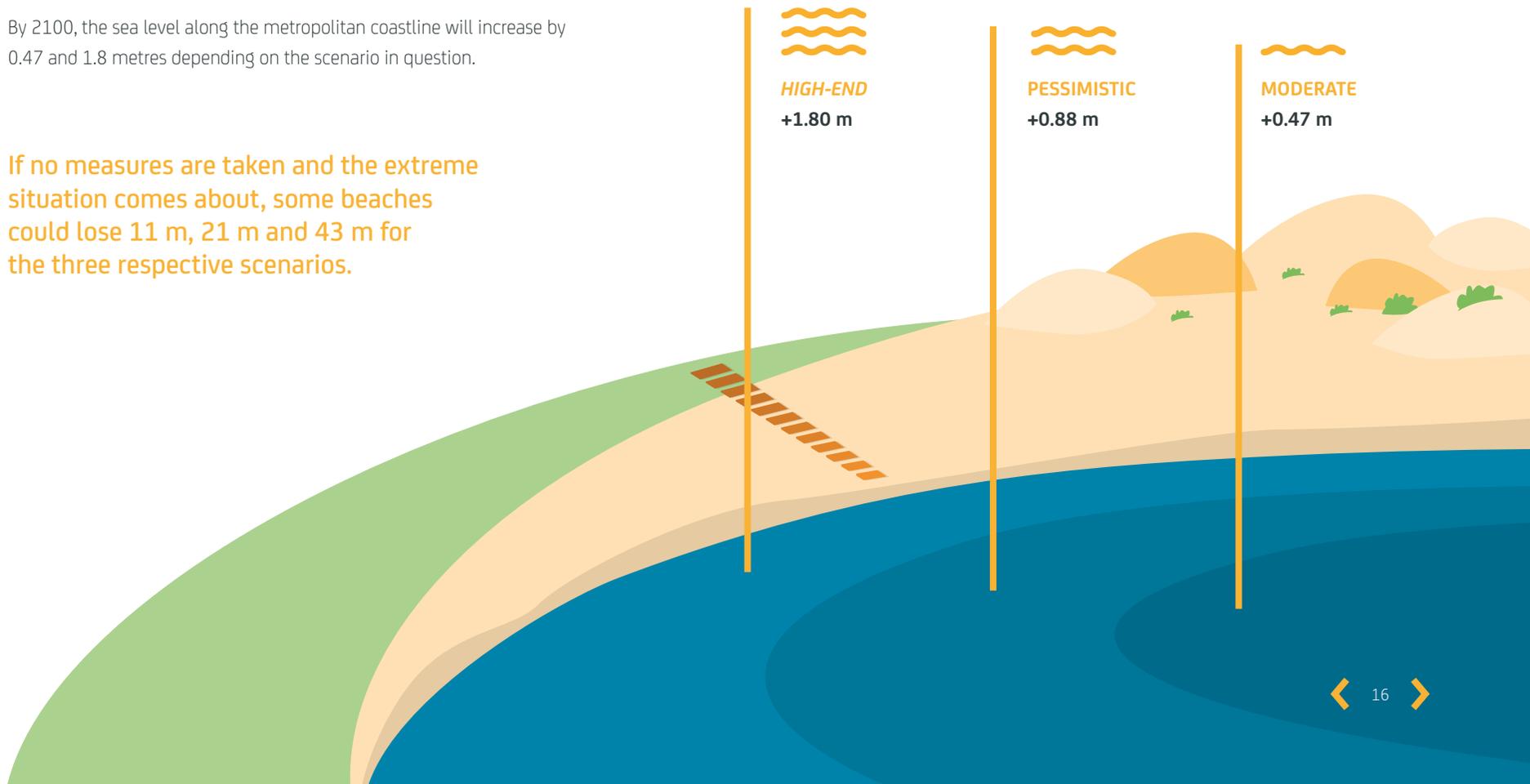
HIGH-END
+1.80 m



PESSIMISTIC
+0.88 m



MODERATE
+0.47 m





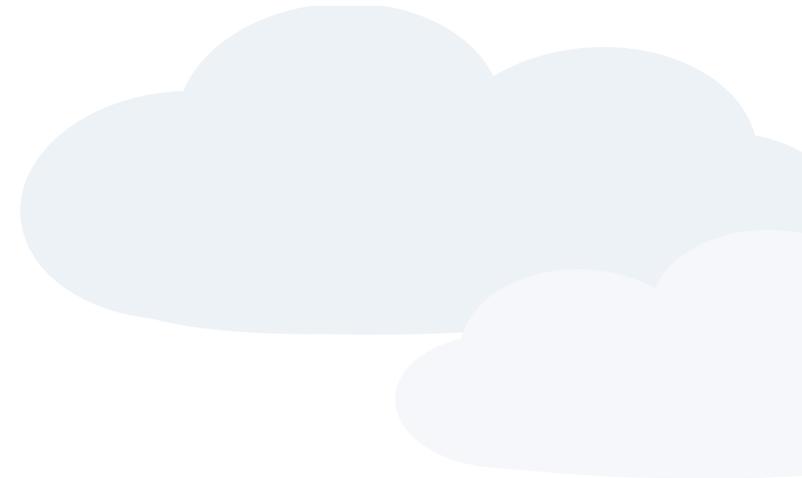
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GENERAL SPHERES OF ACTION

As mentioned previously, the ultimate aims of the Climate and Energy Plan 2030 is to combat climate change and bring about genuine energy transition in the AMB. To achieve this, a wide range of actions have been determined (structural, such as promoting renewable energy sources, and related to governance, such as raising the awareness of the inhabitants, but also technical and policy-related). These actions can be divided into 4 multidisciplinary spheres that are not limited to specific administrations, responsibilities or sectors.

SPECIFIC LINES OF ACTION

Lines of action have been determined within these four broad spheres, each with several concrete, specific measures. A specific code has been defined for each measure in the Climate and Energy Plan 2030 in accordance with the sphere and specific line in question. The Plan contains a total of 92 measures divided into 13 lines and 4 spheres of action.



CODING SYSTEM FOR THE MEASURES IN THE CLIMATE AND ENERGY PLAN 2030

ABC-0-0

The non-numerical part is made up of three or four letters assigned to each sphere (*RES, ENER, EDU and GOV*)

Number corresponding to the specific line of action (*RES-1, RES-2, ENER-5, etc.*)

Number identifying each specific measure (*RES-1-1, RES-2-1, ENER-5-1, etc.*)

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RENATURALISING TO BECOME MORE RESILIENT AND LIVE BETTER

In order to improve the resilience of cities it is vital to promote the green infrastructure by enhancing green spaces, improving soil permeability, ecologically regulating the water cycle and carrying out work on zones at risk from the heat island effect, among other strategies. It is also vital to include criteria related to comfort and energy efficiency when reconditioning buildings to guarantee quality of life indoors.

Beyond the city's actual borders, preserving certain areas such as the coastline and nearby or interstitial areas, farmland and even all the roofs and subsoil provides the region with ecologically classified zones, suppliers of environmental services, etc.



PROMOTING THE LOCAL GENERATION OF RENEWABLE ENERGY AND MORE EFFICIENT USE OF ENERGY, WATER AND OTHER RESOURCES

Energy transition is the gradual replacement of energy from fossil fuels to renewable, local sources, as well as altering how energy is produced, distributed, managed and consumed. Public administrations play a key role in encouraging this transition. The AMB is moving towards lower-carbon management in the facilities and companies it runs, a total of 57 organisations that set targets to reduce emissions. Water and energy are fundamental from the point of view of optimal resource utilisation and a comprehensive view is required of the whole water cycle, increasing resilience and promoting the use of local water resources, adjusting the source and treatment to the quality demanded and reducing dependency on other areas.



AN ACTIVE REGION AND CITIZENS COMMITTED TO CLIMATE JUSTICE

Any measure may become ineffective or even fail without the backing of the inhabitants. That is why it is vital for the commitment of citizens to be included in climate-related measures. Awareness and education that include criteria related to climate justice, new issues such as the need to adapt, educating people about managing energy, new types of organisation, etc. all help to engage citizens and actively involve them in the change.



METROPOLITAN GOVERNANCE COORDINATED WITH COUNCILS

The issue of climate governance is often ignored. From a metropolitan perspective, encouraging and improving coordination with municipalities and other public administrations helps to optimise resources, share knowledge and shorten the time required to react by everyone acting together in terms of their commitment to the climate. The new challenges imposed by climate change demand new types of governance and rapid adaptation to tackle these challenges successfully.

GENERAL SPHERES OF ACTION



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RENATURALISING TO BECOME MORE RESILIENT AND LIVE BETTER

(CODE: RES)

LINE RES-1 4 measures

Buildings adapted to the new climate conditions

LINE RES-2 8 measures

More green spaces that are more permeable and cooler

LINE RES-3 3 measures

Promote and preserve biodiversity

LINE RES-4 4 measures

A resilient, long-lasting coastline



PROMOTING THE LOCAL GENERATION OF RENEWABLE ENERGY AND MORE EFFICIENT USE OF ENERGY, WATER AND OTHER RESOURCES

(CODE: ENER)

LINE ENER-5 14 measures

Supply local, renewable energy for everyone and always

LINE ENER-6 19 measures

Reduce demand and increase energy efficiency

LINE ENER-7 6 measures

More efficient water management

LINE ENER-8 5 measures

Metropolitan infrastructures adapted to extreme conditions

LINE ENER-9 5 measures

Circular economy as a sustainable metropolitan model



AN ACTIVE REGION AND CITIZENS COMMITTED TO CLIMATE JUSTICE

(CODE: EDU)

LINE EDU-10 5 measures

Education and raising awareness about climate change and adaptation at all levels of society

LINE EDU-11 5 measures

Education and raising awareness about energy at all levels of society



METROPOLITAN GOVERNANCE COORDINATED WITH COUNCILS

(CODE: GOV)

LINE GOV-12 7 measures

Better coordination between organisations

LINE GOV-13 7 measures

More energy and climate training in the AMB

SPECIFIC LINES OF ACTION



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RENATURALISING TO BECOME MORE RESILIENT AND LIVE BETTER

Below are the 19 measures that make up the 4 lines of action within this sphere, whose aim is to increase the resilience of cities and natural spaces in the metropolitan area.

LINE	MEASURE CODE	MEASURE TITLE	LEVEL OF ACTION	STRATEGY
LINE 1: Buildings adapted to the new climate conditions	RES-1-1	Adapt building design taking into account the variations in environmental conditions resulting from climate change	Metropolitan	Adaptation
	RES-1-2	Include recommendations related to environmental and energy aspects when the buildings start to be used	Metropolitan	Adaptation
	RES-1-3	Encourage reconditioning and renovation in the most vulnerable urban areas	Metropolitan	Adaptation
	RES-1-4	Measure the interior temperature of residential and public buildings	Metropolitan	Adaptation
LINE 2: More green, permeable and cooler spaces	RES-2-1	Comprehensive plan of the area to appropriately regulate the water cycle	Metropolitan	Adaptation
	RES-2-2	Promote the qualitative values and the environmental services provided by green spaces	Metropolitan	Adaptation
	RES-2-3	Regulations in urban areas to ensure permeability and separating systems	Metropolitan	Adaptation
	RES-2-4	Reclaim roadside green spaces to adapt the most vulnerable zones to the heat island effect	Metropolitan	Adaptation
	RES-2-5	Adapt service infrastructures (new and existing) to prevent them from occupying areas at risk	Metropolitan	Adaptation
	RES-2-6	Optimise the management of water and energy for parks, beaches and ring roads	Metropolitan	Adaptation
	RES-2-7	Analyse the thermal performance of the Gavà-Viladecans-Castelldefels ribbon development	Metropolitan	Adaptation
	RES-2-8	Analyse the AMB's regional performance regarding heatwaves	Metropolitan	Adaptation
LINE 3: More adapted and functional biodiversity	RES-3-1	Improve eco-system services and ecological performance in the AMB	Metropolitan	Adaptation
	RES-3-2	Evaluate the systems to regreen river banks, taking the real characteristics of the rivers into account	Metropolitan	Adaptation
	RES-3-3	Integrate biodiversity as an aspect that helps to adapt to new climate conditions	Metropolitan	Adaptation



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LINE 4: A resilient, long-lasting coastline	RES-4-1	Organise the coastline based on sustainability criteria related to climate change effects	Metropolitan	Adaptation
	RES-4-2	Reclaim the dune system as a complete, adaptive and sustainable solution	Metropolitan	Adaptation
	RES-4-3	Adapt resources for beach maintenance services in line with each season	Metropolitan	Adaptation
	RES-4-4	Extend and update existing studies on how climate change might affect the metropolitan coastline	Metropolitan	Adaptation



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HYBRID DUNES

Measure RES-4-2 of the Climate and Energy Plan 203 has a precedent in the form of the Hybrid Dune Project, started in 2014, to recover the dune system of the metropolitan beaches which, in previous years, had been severely damaged by humans, pets and invasive species, damage which has been further aggravated by the effects of climate change.

Dunes are essential structures in mitigating the effects of rising sea levels due to climate change, as well as encouraging biodiversity and helping to maintain sediment in the medium and long term. They are therefore very useful in preserving the coastline and ensuring the continuity of the beaches. Correct management of the beaches, including the maintenance and management of dunes, can help to prevent the consequences of sea storms which can cause a lot of damage and expense during winter months.

To date, action has been carried out in 17 different zones, at the dune areas of the beaches of Castelldefels, Gavà and Viladecans, as well as removing sand from the Besòs estuary. The dune recovery work carried out so far has managed to reduce the negative effect of the coastline regressing due to storms.

Dunes are therefore areas that need to be protected and their value promoted, in terms of the environment, education and landscape; the aim of measure RES-4-2 is to continue this successful project.





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LOCAL GENERATION OF RENEWABLE ENERGY AND MORE EFFICIENT USE OF ENERGY, WATER AND OTHER RESOURCES

Below are the 49 measures that make up the 5 lines of action within this sphere, whose aim is to increase the resilience of cities and natural spaces in the metropolitan area.

LINE	MEASURE CODE	MEASURE TITLE	LEVEL OF ACTION	STRATEGY
LINE 5: Supply clean energy for everyone and always	ENER-5-1	Create a network of metropolitan solar charging stations: roll-out plan and new installations	Metropolitan	Transition
	ENER-5-2	Encourage solar photovoltaic installations in buildings with municipal public facilities	Municipal	Transition
	ENER-5-3	Develop a strategy to take advantage of forestry biomass in rural municipalities in the Baix Llobregat area and implement DHC networks	Municipal	Transition
	ENER-5-4	Encourage renewable energy generation on the roofs of industrial buildings in industrial estates	Metropolitan	Transition
	ENER-5-5	Promote the production of energy using renewable sources in above-ground car parks	Municipal	Transition
	ENER-5-6	Carry out a pilot project to become a 100% renewable municipality	Municipal	Transition
	ENER-5-7	Promote the implementation of solar arrays in abandoned agricultural areas of the AMB	Metropolitan	Transition
	ENER-5-8	Update studies on the potential of renewable resources	Metropolitan	Transition
	ENER-5-9	Reconvert urban elements into generators of photovoltaic electricity and implement new urban elements (pergola type) incorporating this kind of energy	Municipal	Transition
	ENER-5-10	Implement renewable energy generation systems at the refreshment stalls of parks and beaches	Municipal	Transition
	ENER-5-11	Implement acoustic screens with renewable generation systems	Metropolitan	Transition
	ENER-5-12	Use solar technology for vertical signage on the ring roads	Institutional	Mitigation
	ENER-5-13	Install photovoltaic structures on the roofs of water cycle facilities	Institutional	Mitigation
	ENER-5-14	Promote renewable energy production on the roofs of residential buildings	Metropolitan	Transition



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LINE 6: More efficient energy management	ENER-6-1	Invest in the energy-oriented reconditioning of public buildings (nZEB)	Municipal	Transición
	ENER-6-2	Implement energy monitoring and self-management systems in public buildings	Municipal	Transición
	ENER-6-3	Apply the directives of the Metropolitan Municipal Waste Management Programme 2017-2025	Metropolitan	Transition
	ENER-6-4	Recondition buildings in districts at risk of energy poverty to improve their energy performance	Metropolitan	Transition
	ENER-6-5	Promote sustainable, low-emission mobility in the AMB	Metropolitan	Transition
	ENER-6-6	Run an energy efficiency certification campaign for public buildings	Metropolitan	Transition
	ENER-6-7	Carry out the Euronet 50/50 project (or similar) on the public buildings in all municipalities	Municipal	Transición
	ENER-6-8	Manage public facilities based on ESCO formulas	Municipal	Transición
	ENER-6-9	Require the inclusion of sectoring and monitoring clauses in all tender specifications in the AMB	Metropolitan	Transition
	ENER-6-10	Create energy efficiency schemes for commercial premises	Metropolitan	Transition
	ENER-6-11	Implement a synergy programme between AMB companies	Metropolitan	Transition
	ENER-6-12	Replace and improve the decanter centrifuges at waste water treatment plants	Institutional	Mitigation
	ENER-6-13	Renew the pumping systems at potable water treatment plants	Institutional	Mitigation
	ENER-6-14	Renew the corporate fleets of companies managing water cycle facilities based on efficiency criteria	Institutional	Mitigation
	ENER-6-15	Include a "fuel type" criterion when renewing passenger transport vehicles	Institutional	Mitigation
	ENER-6-16	Renew, replace and improve the processes and machinery to save electricity and increase energy efficiency at waste and water cycle facilities	Institutional	Mitigation
	ENER-6-17	Implement a smart system to manage and monitor the efficient driving of licensed bus operators	Institucional	Mitigation
	ENER-6-18	Replace lights and improve lighting efficiency at metropolitan facilities	Institutional	Mitigation
	ENER-6-19	Carry out energy audits and support citizens in the most vulnerable housing	Municipal	Adaptation
LINE 7: More efficient water management	ENER-7-1	Improve the reuse of water in the metropolitan area in line with that established by the Master Plan for Water	Metropolitan	Adaptation
	ENER-7-2	Improve the use of phreatic and other types of water (rainwater, etc.) in the metropolitan area, in line with that established by the Master Plan for Water	Metropolitan	Adaptation
	ENER-7-3	Revise the Master Plan for Rainwater to minimise pressure on the sanitation systems	Metropolitan	Adaptation
	ENER-7-4	Improve energy efficiency at large water treatment facilities	Municipal	Adaptation
	ENER-7-5	Improve the use of water at industrial facilities and establish a regulatory framework for the whole of the AMB that provides measures to optimise water use	Municipal	Adaptation
	ENER-7-6	Study increasing the number of public access points to potable water to tackle especially hot periods, in line with that established by the Master Plan for Water	Metropolitan	Adaptation



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LINE 8: Metropolitan infrastructures adapted to extreme conditions	ENER-8-1	Improve the cooling and ventilation systems of treatment facilities	Municipal	Adaptation
	ENER-8-2	Integrate elements related to adaptation to climate change in the new Metropolitan Municipal Waste Management Programme 2017-2025 and in the administrative and technical clauses of tender specifications	Metropolitan	Adaptation
	ENER-8-3	Establish action plans for waste treatment facilities in the case of storms and frost	Metropolitan	Adaptation
	ENER-8-4	Study the impact of greater emissions of ammonia and volatile organic compounds (VOCs) from organic matter and apply the relevant measures	Metropolitan	Adaptation
	ENER-8-5	Analyse the impact of climate change on infrastructures and apply adaptive measures	Metropolitan	Adaptation
LINE 9: Circular economy as a sustainable metropolitan model	ENER-9-1	Encourage energy efficiency and energy optimisation at large waste treatment facilities	Metropolitan	Adaptation
	ENER-9-2	Promote the circular economy in industrial spheres	Metropolitan	Adaptation
	ENER-9-3	Analyse the impact of climate change on the food chain and ensure food supply to the AMB	Metropolitan	Adaptation
	ENER-9-4	Implement a synergy programme between AMB companies (regarding energy efficiency, technology, business management, etc.)	Metropolitan	Transition
	ENER-9-5	Digitalise processes to save paper in offices	Institutional	Mitigation



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nZEB RECONDITIONING OF SCHOOLS

Since 2015, different municipal infant and primary schools in the AMB, in Viladecans, Castelldefels and Sant Adrià de Besòs, have been chosen to implement reconditioning projects based on nZEB criteria (Nearly Zero Energy Buildings), as established by the EU Directive on energy efficiency in buildings.

As part of this project, numerous visits were made and campaigns carried out to measure different parameters in situ at the three buildings in order to describe their characteristics, carry out an energy analysis of the building, the facilities and air quality and, finally, obtain the energy performance of each centre based on an advanced dynamic simulation.

After the excellent results of these studies, the aim of measure ENER-6-1 in the Climate and Energy Plan 203 is to continue with the nZEB reconditioning of other public facilities in the metropolitan area.

Proposals were then made for the different strategies to be implemented (previously defined and financially assessed) in order to achieve the target levels of reduction in consumption according to nZEB criteria: from the level required to obtain Passivhaus certification to achieving more tolerant Passivhaus levels in summer or obtaining level B certification. Among other outcomes, the study has shown that the following reductions can be achieved by means of an energy-based reconditioning of these schools: of 86-89% in the demand for heating, 72-80% in gas consumption and 55-75% in CO₂ emissions, at a very reasonable cost. Similarly, the air quality inside the schools would improve as well as thermal comfort, with the initial investment compensated in under 20 years. Viladecans Council has taken the lead in this area and will soon start the first phase of reconditioning the El Garrofer school, one of those studied by AMB, to turn it into one of the first infant and primary schools in the whole of Spain to be reconditioned in nZEB terms.





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OCCUPATIONAL SOLAR RECHARGING POINTS

The AMB, in coordination with the Councils of Sant Feliu and Esplugues de Llobregat, as well as the AMB Laboratory, has set up various metropolitan solar recharging points, installations that allow the administration's electric vehicles to be charged using renewable energy during the work day.

The installation shown in the photo (Sant Feliu de Llobregat) is designed for anyone who wishes to leave their vehicle charging at the Park&Ride in the Sant Feliu local train station while they travel to Barcelona on public transport.

The solar charging point converts solar energy into electricity by means of a photovoltaic pergola and has two uses: it generates electricity to recharge any electric vehicles connected and can also provide additional electricity, when required, for the neighbouring municipal day centre for the elderly (Casal Municipal de la Gent Gran). This means the Council saves both money and energy. The facility has fifteen photovoltaic modules (3.975 kWp) (supplying the energy required for a conventional slow charge) and an exterior charging point for two vehicles. The occupational solar charging point promotes renewable energy sources in the electric vehicle charging network, promotes intermodality with public transport, improves air quality and therefore the health of citizens and also helps to combat climate change by reducing CO₂ emissions due to the consumption of mains electricity.

Due to the great success of these charging points, the aim of measure ENER-5-1 of the Climate and Energy Plan 2030 is to continue installing occupational solar charging points integrated within the metropolitan charging system in other municipalities.





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FLOOD PREVENTION BY MONITORING AND MANAGING THE SPILLWAYS IN THE METROPOLITAN DRAINAGE SYSTEM

The water drainage system includes the whole process of transporting and treating waste water at treatment plants. The AMB manages this process from connection points with the municipal sewerage networks up to the regeneration of treated water. In the face of climate change, during episodes of heavy rainfall the sewerage network and collectors must be able to get rid of the large amounts of rainwater as efficiently as possible, as well as any waste water (the metropolitan system is mostly a combined system). In this respect, the spillway system in the metropolitan drainage system evacuates rain and waste water that cannot be handled by the sewerage network. Royal Decree 1290/2012, of 7 September (BOE 227, 20 September 2012) establishes various obligations for those permitted to carry out discharges into the system regarding aspects of quantification, technical studies and an assessment of the effects of spillways on the destination environment, which must be defined and quantified to make them easier to implement. In June 2017 a detailed project was presented to install a network to quantify discharges during rainy periods, integrated within the control systems of the AMB treatment plants. To assess and detect overflows during rainy periods, in 2015 a preliminary inventory was carried out of the spillways in the metropolitan drainage system. The aim of this project is to provide the means to detect and quantify spillways for a total of 93 control points in the existing drainage system. This quantification of overflows during rainy periods in the AMB drainage system can essentially be divided into three different measures: the supply of equipment, installation of resources to measure and calibrate, and the integration of information in the control systems of metropolitan treatment works. It will then be possible to quantify discharges during rainy periods in order to identify where priority action should be taken and evaluate what needs to be done to minimise impact. This measure forms part of the AMB Climate Change Adaptation Plan (ENER-7-3).





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AN ACTIVE AREA WITH CITIZENS COMMITTED TO CLIMATE JUSTICE

Below are the 10 measures that make up the 2 lines of action within this sphere, whose aim is to raise awareness and educate society regarding climate justice, adaptation, energy and energy efficiency.

LINE	MEASURE CODE	MEASURE TITLE	LEVEL OF ACTION	STRATEGY
LINE 10: Training and education about climate change and adaptation at all levels of society	EDU-10-1	Create mechanisms to incorporate and disseminate internally the concept of adaptation to climate change	Institutional	Adaptation
	EDU-10-2	Promote a specific educational and training proposal regarding the issues of adaptation for municipal specialists and elected politicians	Metropolitan	Adaptation
	EDU-10-3	Produce and disseminate new educational resources on adaptation to climate change	Metropolitan	Adaptation
	EDU-10-4	Incorporate the concept of climate change and resilience in financial and business activities	Metropolitan	Adaptation
	EDU-10-5	Encourage professions and business initiatives related to elements connected to adaptation to climate change	Metropolitan	Adaptation
LINE 11: Training and education about energy and energy efficiency at all levels of society	EDU-11-1	Create a crowd-funding platform to promote projects to generate renewable energy	Metropolitan	Transition
	EDU-11-2	Design a strategy for a new energy culture in coordination with the programme "Compartim un futur"	Metropolitan	Transition
	EDU-11-3	Create the campaign "Active families for climate and energy"	Metropolitan	Transition
	EDU-11-4	Create an open channel of advice for companies in AMB's industrial sector	Metropolitan	Transition
	EDU-11-5	Spread good practices and benchmarking techniques among companies and facilities within the Carbon Management Strategy	Institutional	Mitigation



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EDUCATIONAL PROGRAMME “COMPARTIM UN FUTUR”

The aim of the metropolitan programme of education for sustainability (PMES) “Compartim un futur” is to raise awareness and educate about the environment. It encourages sustainable habits among the population, promotes critical thought and offers citizens the necessary tools and values to forge a sustainable future. It's an educational programme with over 120 activities focusing on 6 core areas, including climate change which covers adaptation and mitigation, renewable energy sources and environmental health, among many other aspects. Every year, over 49,000 people take part and it is therefore an important way to bring together educational experiences aimed at different groups of citizens (children, families, students, leisure facilities, etc.).

In this Climate and Energy Plan 2030, through measure EDU-10-3, the aim is to continue implementing the “Compartim un futur” programme as well as to produce and disseminate new educational resources on adaptation to climate change.

Among the strategies on which the programme is based is the integration of ICTs and social media as an opportunity to reach an increasingly technological society and students; the diversification of different types of activity, stressing the most experiential and participatory, by means of which people learn by doing, based on action and involvement, and innovation in educational and pedagogical methodologies encouraging a closer connection between universities and the educational community using collaboration agreements.

Throughout the 2016-2017 academic year, 2,533 activities were carried out on a range of subjects, such as the waste or water cycle, responsible consumption, energy and biodiversity. Participation during the 2015-2016 academic year was much greater than previous years, such as 2009-2010 when around 14,000 people took part.





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METROPOLITAN GOVERNANCE, COORDINATION WITH COUNCILS

Below are the 14 measures that make up the 2 lines of action within this sphere, whose aim is to increase the AMB's climate and energy capabilities and encourage internal coordination within the AMB and between the different public administrations.

LINE	MEASURE CODE	MEASURE TITLE	LEVEL OF ACTION	STRATEGY
LINE 12: Better coordination between organisations	GOV-12-1	Set up the AMB's specialist commission for Adaptation to Climate Change	Institutional	Adaptation
	GOV-12-2	Implement a strategy of dissemination and awareness-raising for the AMB's Adaptation Plan: app to coordinate and disseminate climate havens and raise awareness regarding heatwaves	Metropolitan	Adaptation
	GOV-12-3	Encourage participation in international projects and initiatives related to climate change outside the AMB	Metropolitan	Adaptation
	GOV-12-4	Promote coordination between the AMB, metropolitan municipalities and the Barcelona Provincial Council	Metropolitan	Adaptation
	GOV-12-5	Create a municipal energy observatory	Metropolitan	Transition
	GOV-12-6	Create a metropolitan energy management body shared by different municipalities	Metropolitan	Transition
	GOV-12-7	Define sustainability criteria for the AMB's new developments and urban transformations	Metropolitan	Transition
LINE 13: More energy and climate training in the AMB	GOV-13-1	Set up the Metropolitan Energy Agency	Metropolitan	Transition
	GOV-13-2	Set up the Metropolitan Fund for Energy Transition	Metropolitan	Transition
	GOV-13-3	Create a public electricity provider	Metropolitan	Transition
	GOV-13-4	Update the functioning of the Metropolitan Panel for a New Energy Model	Metropolitan	Transition
	GOV-13-5	Create a specific programme to spread successful projects among the metropolitan municipalities	Metropolitan	Transition
	GOV-13-6	Create a catalogue of energy services for the metropolitan municipalities	Municipal	Transition
	GOV-13-7	Promote the Programme of voluntary agreements among the companies and facilities that form part of the Carbon Management Strategy	Institutional	Mitigation



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METROPOLITAN PANEL FOR A NEW ENERGY MODEL

The energy agents of the future must preferably act based on public authority but at a local level. In this context, the AMB manages the metropolitan energy transition taking into account the fact that it covers a densely populated region with high energy consumption rates. To do so, it has a forum for debate and a working group, the Metropolitan Panel for a New Energy Model. Among other actions, this multi-party panel has developed a catalogue of measures to encourage energy transition which municipalities can introduce in their municipal by-laws; studies to recondition public buildings based on nZEB criteria (nearly Zero Energy Buildings) and has introduced energy saving and efficiency criteria in contracts, as well as digital applications (such as the solar calculator) which aim to help and reinforce this energy transition on a metropolitan scale.

This working group, set up on 29 April 2015, has an energy specialist from each metropolitan municipality that aims to enhance dialogue between the municipalities and the AMB. The Metropolitan Panel provides first-hand knowledge of the energy situation

in the municipalities, a necessary condition to be able to put into practice more effective and useful policies to support energy transition. The panel's meetings are used to share and discuss successful cases as well as common problems, any barriers identified, arrange applications to obtain funding and the needs of municipalities. As a result of the Panel's ordinary meetings, the AMB has promoted over 30 specific projects in various municipalities, as well as other strategies at a metropolitan level.

Given the great success of the Metropolitan Panel for a New Energy Model, measures GOV-13-4 and GOV-13-5 of the Climate and Energy Plan 2030 will further enhance the performance of this group and improve the exchange of good practices and experiences between municipalities.





KEY MEASURES

Of the 92 measures contained in the Climate and Energy Plan 2030, below are those that take priority, either because they are already being carried out or because they will begin during the first phase of the Plan's implementation, during the period 2018-2021.

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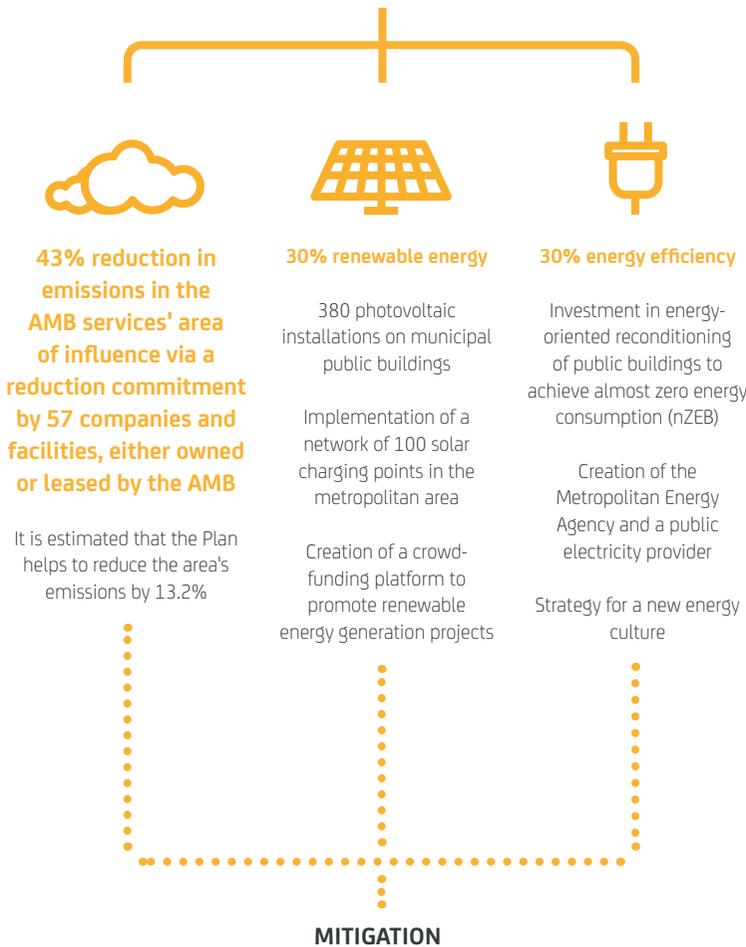
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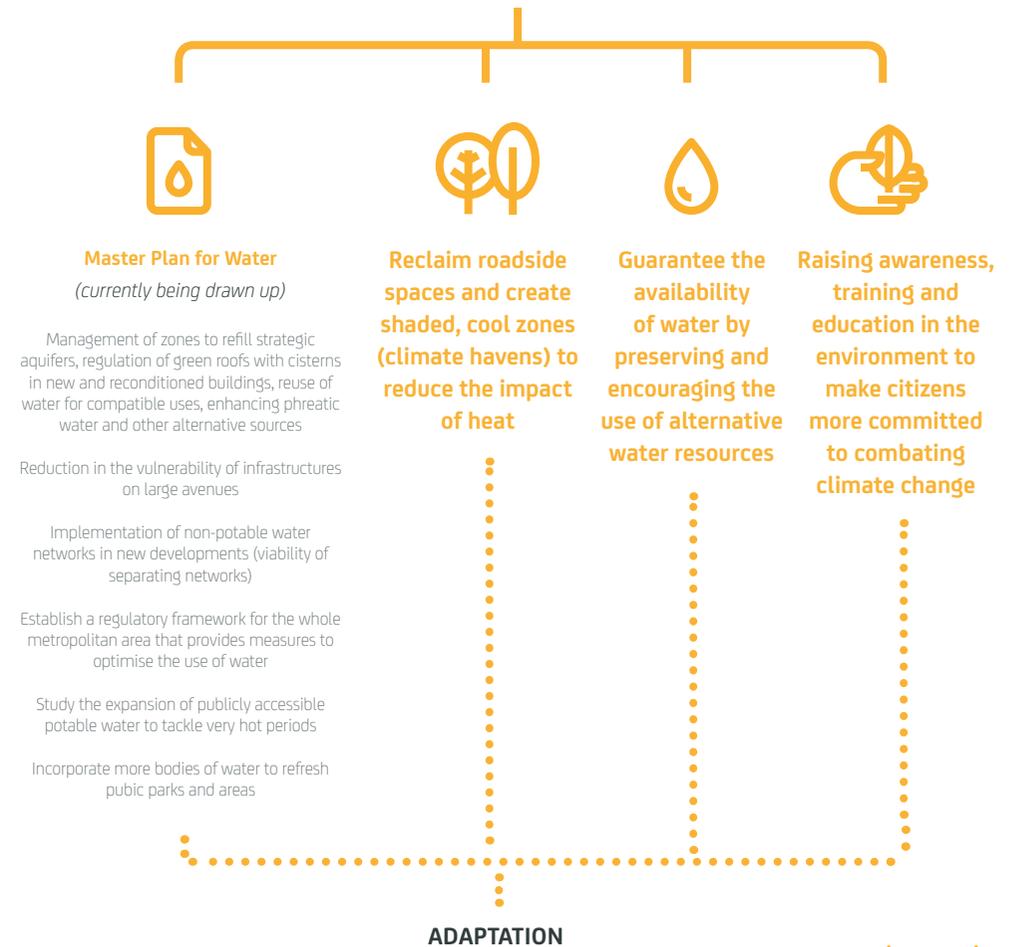
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A METROPOLITAN AREA THAT IS MORE SELF-SUFFICIENT IN ENERGY TERMS AND CLOSER TO CARBON-NEUTRAL



THE MOST RESILIENT METROPOLITAN AREA TO THE IMPACTS OF CLIMATE CHANGE





COORDINATION, RAISING AWARENESS AND PARTICIPATION IN THE CLIMATE AND ENERGY PLAN

Coordination, participation and dissemination will be carried out via ordinary meetings held by an AMB resilience panel, the Metropolitan Panel for a New Energy Model and the Specialist Monitoring Committee for the Strategy, with the participation of all agents involved depending on the appropriateness and requirements of each meeting, internally between AMB departments and also with other public administrations, citizens, private sector, industry, etc.

Coordination is also planned with the metropolitan municipalities regarding the adaptation measures affecting the AMB (see the table of synergies of the Adaptation Plan - PLACCs).

And also coordination and continuous dialogue with the companies and organisations involved in the Strategy to redefine and revise the emission targets in accordance with the current or future lines of action, via each organisation's roadmap.

WORKSHOP OF THE PROGRAMME "COMPARTIM UN FUTUR"

INVOLVEMENT

Citizen involvement, AMB departments, other public administrations, private sector, industry and other agents

COORDINATION

AMB Internal
AMB - public administrations (municipal, province, Catalonia)
AMB - participating companies

DISSEMINATION

Disseminating the Plan at all levels

PLAN CLIMA Y ENERGÍA



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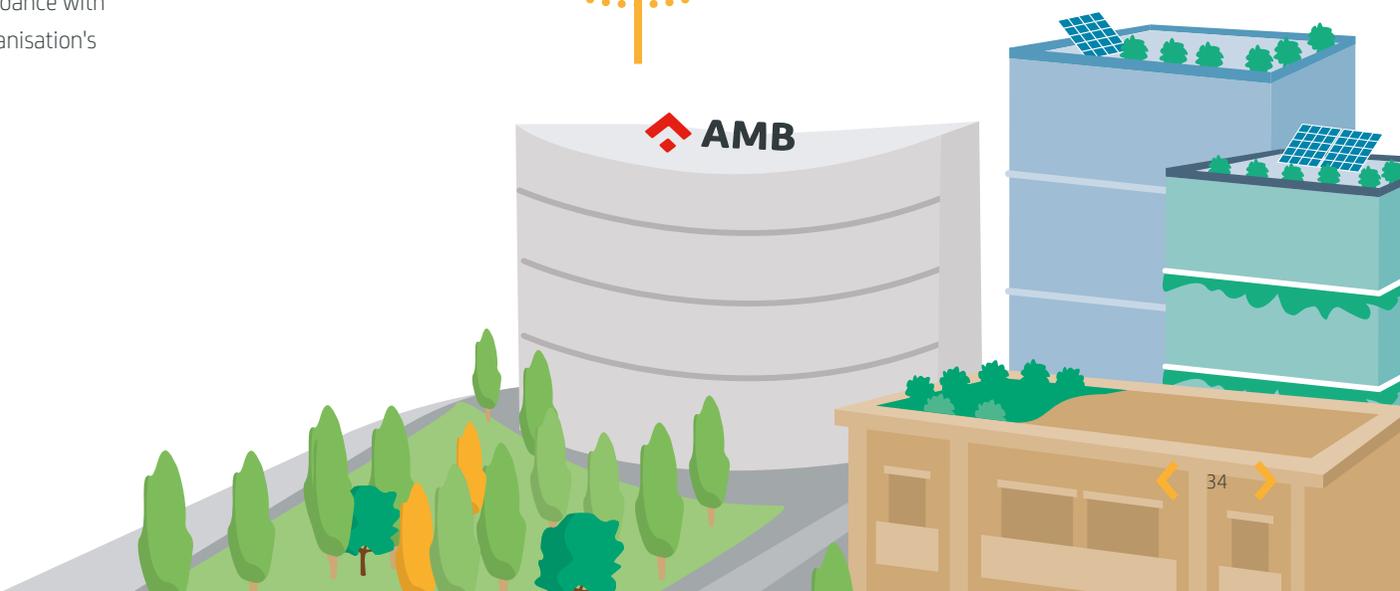
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SUPERVISING THE CLIMATE AND ENERGY PLAN



ANNUAL FOLLOW-UP REPORT:

verifies the measures planned for the year in question have been carried out; assesses the targets and outcomes achieved, suggests improvements and provides indicators to follow up performance. The data of the Mitigation Strategy inventory will also be updated on an annual basis.



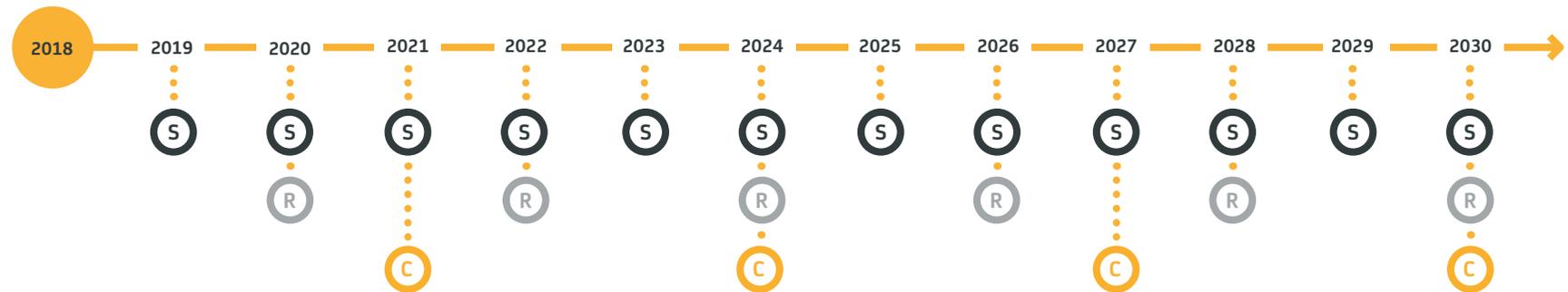
BIENNIAL REVISION REPORT:

assesses the achievement of targets and proposes modifications, updates or improvements in the targets and measures. If applicable, this will also contain the findings of new studies regarding climate change and energy that may have been carried out by the AMB.



TRIENNIAL CLIMATE AND ENERGY PLAN CONVENTION:

held between all those involved in the Plan to evaluate its progress.



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CLIMATE PLAN BUDGET (2018-2021)

SPHERE

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SAVINGS MWH/YEAR
UP TO 2021

RES*: renaturalising to become more resilient and live better

126,890

RES-1-4: Measure the interior temperature of residential and public buildings

80,000

not quantifiable

RES-2-7: Analyse the thermal performance of the Gavà-Viladecans-Castelldefels ribbon development

28,000

not quantifiable

RES-2-8: Analyse the AMB's regional performance regarding heatwaves

18,890

not quantifiable

ENER**: promote local generation of renewable energy and greater efficiency in the use of energy and other resources

10,162,727

ENER-5-1: Create a network of metropolitan occupational solar charging stations: roll-out plan and new installations

640,000

457

ENER-5-2: Encourage solar photovoltaic installations in buildings with municipal public facilities

2,800,000

2,136

ENER-5-5: Promote the production of energy using renewable sources in above-surface car parks

204,660

156

ENER-5-8: Update studies on the potential of renewable resources

50,000

not quantifiable

ENER-5-14: Promote renewable energy production on the roofs of residential buildings

900,844

687

ENER-6-1: Invest in the energy-oriented reconditioning of public buildings (nZEB)

3,201,955

2,457

ENER-6-2: Implement energy monitoring and self-management systems in public buildings

1,872,900

2,653

ENER-6-6: Run an energy efficiency certification campaign for public buildings

186,368

not quantifiable

ENER-6-7: Carry out the Euronet 50/50 project on the public buildings in all municipalities

15,000

not quantifiable

ENER-6-8: Manage public facilities based on ESCO formulas

221,000

313

ENER 9-1: Encourage energy efficiency and energy optimisation at waste treatment facilities

70,000

not quantifiable

EDU: an active area and citizens committed to climate justice

436,000

EDU-11-1: Create a crowd-funding platform to promote projects to generate renewable energy

266,000

not quantifiable

EDU-11-2: Design a strategy for a new energy culture in coordination with the programme "Compartim un futur"

90,000

not quantifiable

EDU-10-3: Produce and disseminate new educational resources on adaptation to climate change

30,000

not quantifiable

EDU-11-3: Create the campaign "Active families for climate and energy"

50,000

not quantifiable

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SAVINGS MWH/YEAR
UP TO 2021

GOV*: metropolitan governance, coordination with councils**

1,049,200

GOV-12-1: Set up the AMB's specialist commission for Adaptation to Climate Change

15,000

not quantifiable

GOV-12-2: Implement a strategy of dissemination and awareness-raising for the AMB's Adaptation Plan: app to coordinate and disseminate climate havens and raise awareness regarding heatwaves

30,000

not quantifiable

GOV-12-5: Create a municipal energy observatory

164,000

not quantifiable

GOV-12-6: Create a metropolitan energy management body shared by different municipalities

90,000

2,387

GOV-13-1: Create the Metropolitan Energy Agency

760,000

not quantifiable

GOV-13-4: Update the functioning of the Metropolitan Panel for a New Energy Model

5,200

not quantifiable

TOTAL

11,774,817

* RES measures include actions to be carried out in other AMB multidisciplinary plans and programmes (Urban Director Planning [PDU], new PMGRM, Master Plan for Water, Biodiversity Plan, etc.)

** If the investment fund (Metropolitan Fund for Energy Transition) is finally set up, part of this sphere's budget may come from private sources, such as citizens in socialised renewable energy projects

*** Includes structural measures to create the Metropolitan Energy Agency, Energy Provider and Metropolitan Fund for Energy Transition

The measures to reduce emissions of the 57 organisations and/or services that come under the AMB Carbon Management Strategy form part of these organisations' own budgets and are therefore not taken into account. Based on the organisations' specific roadmaps and regarding the next revision of the Climate and Energy Plan, an approximate budget is estimated although no direct investment will be required from the AMB.



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 **AMB** Àrea Metropolitana
de Barcelona