

**TIC  
TAC**  
**CLIMATE  
ACTION**  
**CLI  
MA**

**CLIMATE  
EMERGENCY  
ACTION PLAN  
FOR 2030**

November 2021



**Ajuntament  
de Barcelona**





In 2015, a historic global commitment was reached at the United Nations Climate Change Conference in Paris, following extremely tough negotiations: to take every measure necessary for limiting global warming to 1.5 °C. Since then, member states — with the exception of the USA — have been working to set their own individual emission-reducing targets and associated action plans.

As cities, however, we cannot afford to wait and see whether their proposals are ambitious enough. The future of the fight against climate change is being played out in our streets and squares. We are where most of the population lives, the people most responsible for greenhouse gas emissions, and we are the main focus of innovation. If we want things to change, we have to start by changing ourselves. And that will only be possible if we all take joint responsibility: citizens, companies, associations and authorities.

It was in this framework that the Climate Plan was approved at the Full Municipal Council Meeting of 26 October 2018, thereby complying with one of the commitments undertaken in the Covenant of Mayors for Climate and Energy signed in 2017. Co-produced, as you would expect, by hundreds of the city's organisations, the plan has been strengthening many of the measures we had already been implementing and committing us to launch many others.

A year after the Climate Plan was launched, 15 January 2020, Barcelona declared the climate emergency on 15 January 2020 and accelerated a series of changes involving commitment from all the city's players. Irrefutable scientific evidence and the effects of the global climate crisis that we have already been seeing are compelling us to take urgent and forceful action. The climate emergency declaration is therefore strengthening and speeding up the implementation of some of the initiatives already noted in the Climate Plan, as well as adding new ones, besides taking a further step and extending the city's goals relating to the fight against climate change.

This climate emergency situation presents us with the challenge of bringing about a large city transformation, with seven changes of model and two necessary adaptations which, merged into the eighteen lines of action of Climate Plan and its five areas of action, are being incorporated into the next Climate Emergency Action Plan for 2030. Reducing greenhouse gas emissions down to the necessary levels will not be possible, given our way of living: we will have to change our economic model, our energy model, the way we relate to one another, move around, consume and make our city... and do it as sustainably and fairly as possible. We need to shift towards another system that minimises the environmental impact and increases our resilience as a society.

These changes have been made all the more evident with the COVID-19 crisis,

which has shaken the entire world and put the system's resilience to the test. This health crisis has been a genuine emergency test. We have had to take on the health, social and economic emergency within record time, and learn that if we want to be effective in the fight against the world's challenges, we will need collaboration and solidarity between all geographic areas, authorities and citizens.

We have an opportunity to tackle the climate emergency by planning. But we've only got eight years. Unless we do that, failure to act will come at a very heavy price and, as with COVID-19, with health, social, economic and environmental implications.

Taking on this climate emergency must also be an opportunity for building more resilient, more just, fairer and more environmentally friendly societies. We need to exploit it and generate a local economy and green jobs, incentivise local commerce, transform industry, generate more local energy, prioritise initiatives that have to do with the most vulnerable and the elderly, properly assess care-related work, make more social networks... We need to be capable of creating a new normal that is better for everyone.

This plan, then, is the result of the experience of two years of the Climate Plan's implementation, of a climate emergency declaration and of the points arising from the global COVID-19 health crisis. This is an emergency-action plan which makes the Climate Plan more ambitious, accelerates it and enables other authorities to be called on. We will never be able to tackle this emergency without everyone's involvement.

The climate crisis and its clear effects are no longer just a problem of the future but also a problem of the present. The solutions and adaptations required must be adopted and immediately applied through coordination. This is a challenge that is worth fighting for, not just because it is an act of global justice but also because it will enable us to achieve a healthier, more pleasant and more sustainable city.

We can do everything if we do it together. It is high time we acted against climate change. It's now or never.

Ada Colau Ballano  
Mayor of Barcelona

April 2018



**CONTACT**  
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**SEE**  
C40.org  
@c40cities  
#Cities4Climate

Dear Mayor Colau,

**Re: Confirmation of Paris Agreement Compatible Climate Action Plan**

In 2016 nations of the world ratified a historic global agreement on climate change, the Paris Agreement, committing to keep global average temperatures within 2°C of pre-industrial levels, and to pursue efforts to limit temperature rise to 1.5°C. The Agreement also commits to strengthening the ability of countries to deal with the unavoidable impacts of climate change through adaptation. All of this is set within the context of sustainable development and on the basis of inclusivity for all communities.

C40's aim is that every C40 city will have developed and begun implementing a climate action plan before the end of 2020, which will deliver action consistent with the ambitions of the Paris Agreement, addressing both the need to reduce greenhouse gas emissions and adapt to the impacts of climate change.

With support from our cities, we have developed a Climate Action Planning Framework, which outlines the essential components of a climate action plan that is deemed to be compatible with the goals of the Paris Agreement.

It is with great pleasure that I can confirm we have reviewed Barcelona's Pla CLIMA against our Climate Action Planning Framework and found it to meet the requirements of the framework. Congratulations to you and your team on this achievement and for producing such a robust, integrated and ambitious climate action plan. Cities around the world will be inspired by your leadership.

We look forward to continuing to support Barcelona as you move towards implementing Pla CLIMA.

Your sincerely,

A handwritten signature in black ink, appearing to read "Mark Watts".

**Mark Watts**  
Executive Director  
C40 Cities Climate Leadership Group

C40 CITIES CLIMATE LEADERSHIP GROUP

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BLOCK 1:

# CLIMATE EMERGENCY



1. AN INTEGRATED ACTION PLAN

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4. BARCELONA NOW

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2. WHY A BARCELONA CLIMATE EMERGENCY ACTION PLAN?

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5. BARCELONA IN THE FUTURE

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3. WE ARE NOT STARTING FROM SCRATCH

Page 14

# CLIMATE EMERGENCY

**TIC  
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MA**

**SUSTAINABILITY  
/ INTERNATIONAL  
/ COMMITMENT /  
MITIGATION / ADAPTATION  
/ ACTION / JUSTICE / CLIMATE /  
FUTURE / VULNERABILITY /  
+ HEAT - WATER - BEACHES + FLOODS  
+ URBAN HEAT ISLAND + FIRES  
- BIODIVERSITY - AIR QUALITY  
/ HEALTH / QUALITY OF  
LIFE / EMISSIONS /  
CONSUMPTION /  
POVERTY**

# 1. AN INTEGRATED ACTION PLAN

Cities face a big challenge when it comes to tackling climate change because they generate 70% of greenhouse gas (GHG) emissions. Many of them are therefore adapting their agenda and adopting measures to reduce GHG emissions, minimise dependence on fossil fuels, improve efficiency, reduce metabolic flows and increase resilience. All of those measures are geared towards improving the quality of life and sustainability of cities.

**At COP21 in Paris, Barcelona presented the [Barcelona's Commitment to the Climate \(CBC\)](#)**, promoted by over a thousand businesses, citizen organisations and schools linked to the More Sustainable Barcelona network, signatories of the 2012-2022 Citizen Commitment to Sustainability and Barcelona City Council. This declaration **reaffirms previous municipal commitments** (Covenant of Mayors on Energy and Covenant of Mayors on Adaptation) and **defines Barcelona's roadmap for 2015-2017**, where city citizens and the City Council set out the priorities and the challenges to be overcome by their joint efforts.

The Barcelona Climate Plan, approved in 2018, includes existing actions and strategies along with new ones to achieve these goals, while **fulfilling the commitment it made when signing the Covenant of Mayors for Climate and Energy (2017)**.

A year after the approval and launch of the **Climate Plan for 2018**, alerted by new scientific evidence, Barcelona identified a **climate emergency situation that called for tougher action to minimise greenhouse gas emissions** and adapt to the effects of climate change already observed. Barcelona therefore declared a climate emergency on 15 January. The **Declaration** makes initiatives already provided for in the Climate Plan even more ambitious, while specifying and strengthening them, adding new ones and calling on other authorities to take on the climate emergency.

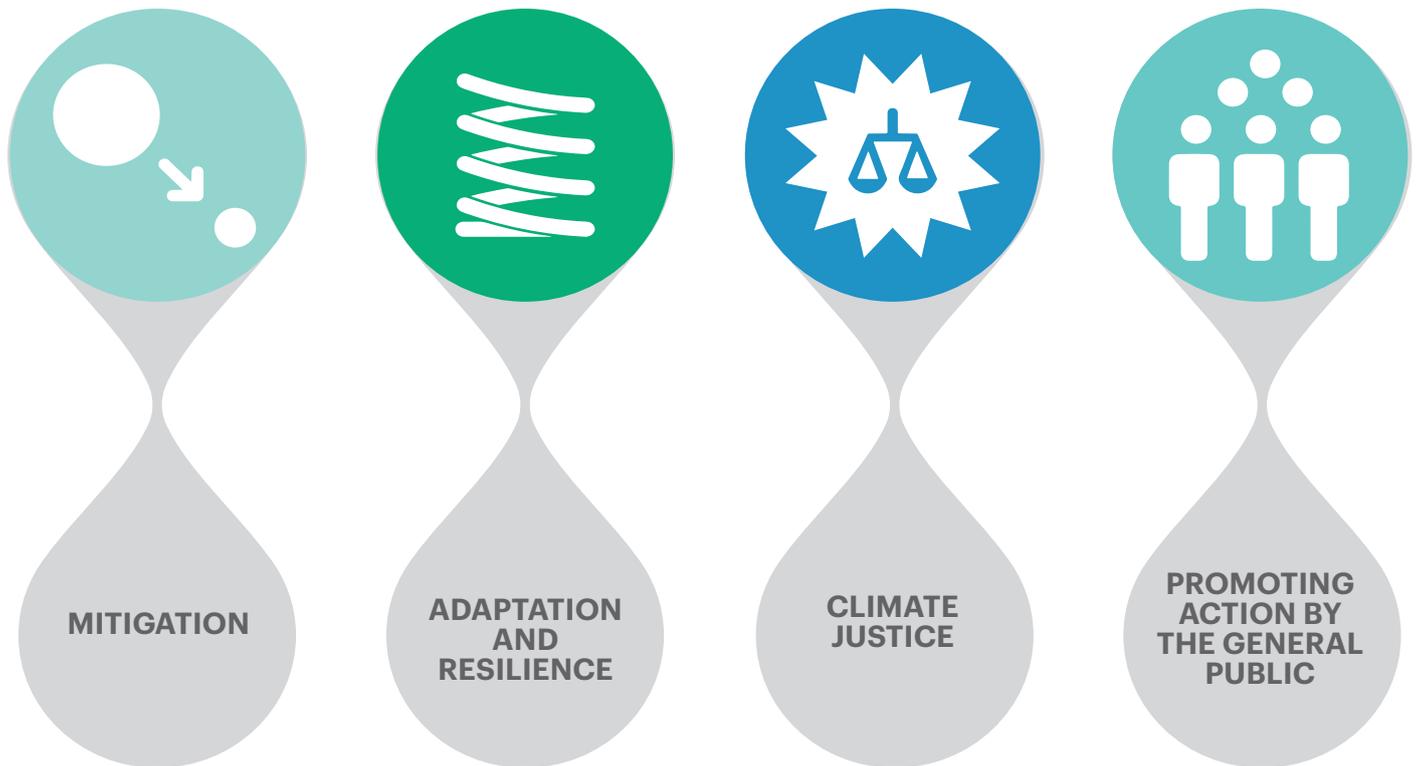
This climate-emergency situation illustrates the need to change the way we live, proposing seven changes of model and two adaptations that will enable a true transition towards a fairer, greener and more resilient economy.

Barcelona wishes to rise to the challenge of the emergency and provide a forceful response, hence its proposal to reduce greenhouse gas emissions by 50% by 2030 (representing around 1,950,000 tonnes) compared to 1992.

The challenge is huge but doing nothing is not an option. This is also an opportunity for deep reflection and moving towards the model of society we want.



The strategic lines the Climate Plan is based on are:



**Mitigation**, because we cannot allow a context of economic recovery to lull us into consuming in an unsustainable way again.

**Adaptation and resilience**, because we can already see the effects of climate change and we have to prepare ourselves.

**Climate justice**, because we need to put the most vulnerable people at the centre of climate policies.

**Promoting action by the general public**, promoting co-creation projects.

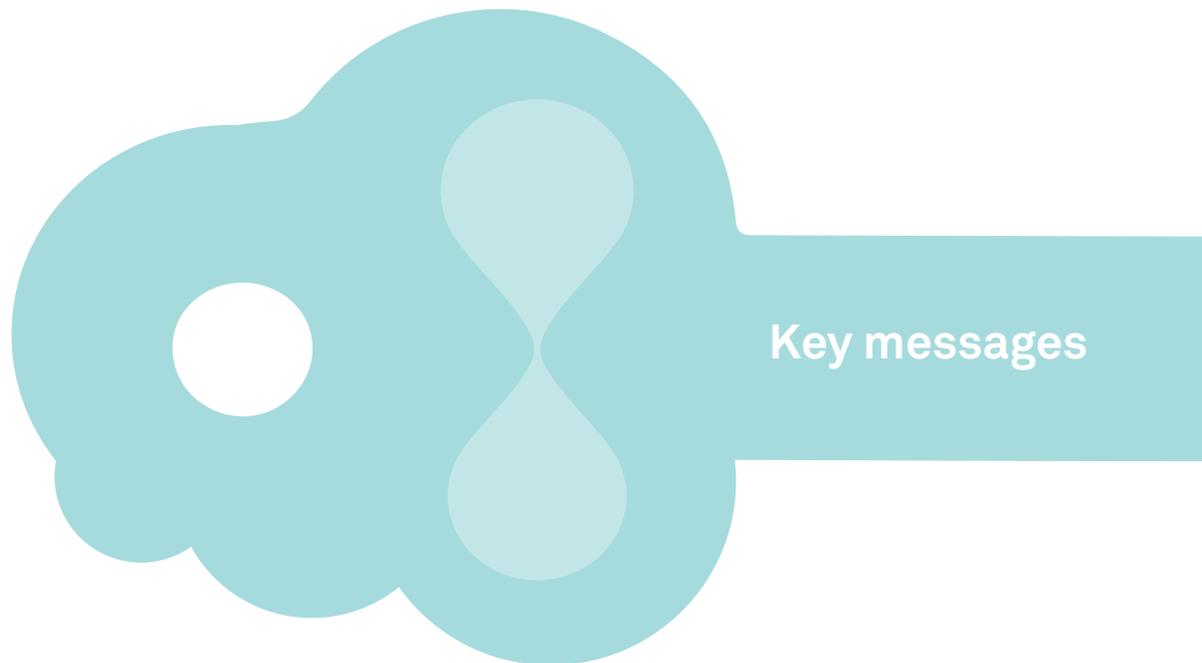


**Mitigation:** all those actions geared towards reducing greenhouse gas emissions.

**Adaptation:** all those actions geared towards reducing vulnerability to climate change.

**Resilience:** the capacity of cities to prevent or, where they are inevitable, minimise the impact of the natural and human-induced hazards they are exposed to, whether they are occasional episodes or tensions over a lengthy period, and to recover as soon as possible in order to continue their essential functions.

# 2. WHY A BARCELONA CLIMATE EMERGENCY ACTION PLAN?



## **WE ARE NOT ON THE RIGHT TRACK FOR ACHIEVING OUR TARGETS**

We are facing one of the most important and complex challenges that humanity has ever had to face. According to the latest studies from the Intergovernmental Panel on Climate Change (IPCC), unless drastic changes are made and greenhouse gas (GHG) emissions reduced, it is “extremely unlikely” the target set in Paris of limiting the Earth’s average global temperature to 1.5% will be achieved. In fact, it has already increased by 1°C and the increase has speeded up in recent years.

If the current rate of emissions continues, it is probable that the average temperature of the planet could rise by over 3°C by the end of the century.

The mitigation and adaptation challenges are huge. We need to rethink our production and consumption model, culture and lifestyle. In fact, the current commitments undertaken by States are not enough to meet the Paris Agreement (2015). We need to be more ambitious and establish the mechanisms and instruments needed for decarbonising the economy and becoming carbon neutral by 2050.

It is in this context that **the Climate Emergency Action Plan represents an opportunity for joining forces and making Barcelona a pioneering city that not only takes responsibility for its contribution to climate change (by reducing emissions) but which is also preparing itself to be less vulnerable to those effects (by adapting) as well as fairer and more participatory (by promoting climate justice and citizen action).**

## GLOBAL RESPONSIBILITY

Human activity is the cause of this climate change. Just 5 countries produce almost 60% of the world's global greenhouse gas emissions. A mere 20 multinational companies produce 35% of these emissions. There needs to be a balanced distribution of responsibilities and negative impact.

## IT AFFECTS PEOPLE'S HEALTH AND EVERYDAY LIVES

Climate change causes serious harm to our health and affects our quality of life.

## CITIES HAVE A LOT TO SAY AND DO

The revolution is clearly an urban one. In fact, cities have enormous potential and a strong will to change things.



## CLIMATE CHANGE IS UNFAIR

Pollution does not affect us all in the same way. We need to reduce inequalities and take care of the most vulnerable.

## THERE'S STILL TIME

We have little time left to act. Ten years, to be precise. So we need urgent, drastic and effective measures.

## WE NEED TO JOIN FORCES

Tackling the change requires all of us to be involved. We need to join forces with all the players involved.

# 3. WE ARE NOT STARTING FROM SCRATCH

Barcelona City Council is firmly committed to implementing locally the climate and energy policies agreed on a European and international level. The Council has signed the following agreements:



Covenant of Mayors on Energy (2008)



Citizen Commitment to Sustainability (2012-2022)



“Making Cities Resilient” campaign and its “10 essentials” (2013)



Covenant of Mayors on Adaptation (2014)



Paris Declaration committing cities to the fight against climate change (2015)



COMPROMÍS DE BARCELONA PEL CLIMA

Barcelona's Commitment to the Climate (2015)



Compact of Mayors (2015)



Covenant of Mayors for Climate and Energy (2017)



Global Covenant of Mayors for Climate & Energy (2017)



Barcelona has been working on climate issues for some years.

Primarily on measures directly related to mitigation, such as energy efficiency and energy saving, with the **Thermal Solar Byelaw (1999)**, the Energy Improvement Plan (2002), the Photovoltaic Solar Byelaw (2011) and the **2011-2020 Barcelona Energy, Climate Change and Air Quality Plan** and subsequently with the approval of other plans and strategies linked to adaptation. Adapting means implementing measures that reduce the city's vulnerability and increase its resilience to the undesirable effects of climate change.

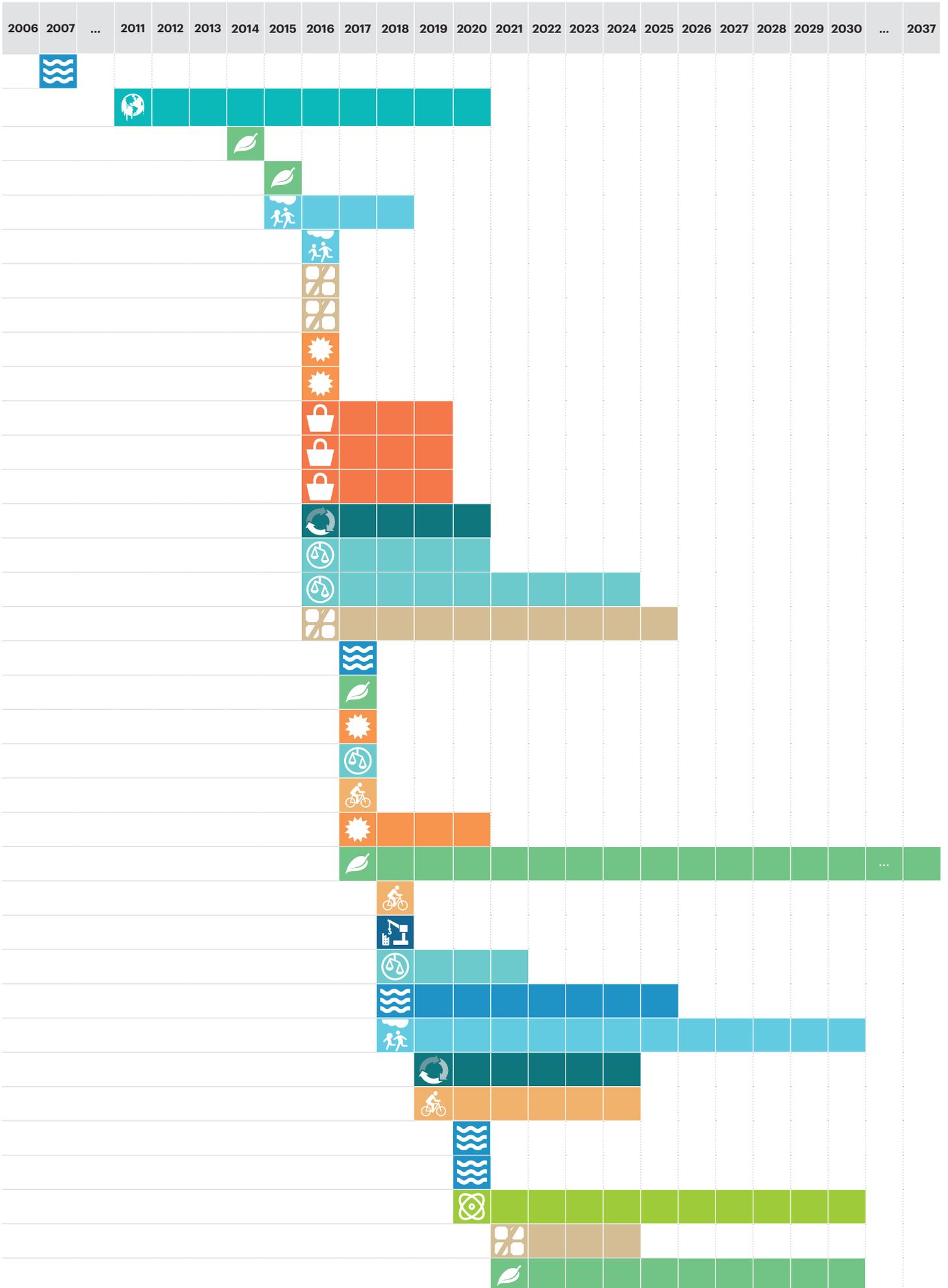
So, as part of the policies for changing the model, to make the city a greener, fairer, more efficient and healthier place, various government measures and strategic plans have been drawn up over the last few years to achieve the climate goals. The Climate Emergency Action Plan recognises that these measures are already planned and therefore focuses on those that need to be developed further or on innovative measures that have not yet passed the planning stage.

The following image shows which strategic line (mitigation, adaptation, climate justice or promoting citizen action) that each plan, programme or government measure contributes to with specific measures.

## GOVERNMENT MEASURES AND STRATEGIC PLANS RELATING TO CLIMATE CHANGE

	Mitigation	Adaptation and resilience	Climate justice	Promoting citizen action
Comprehensive Coastline Management Plan (PGIL) (2007) ▶		●		
Energy, Climate Change and Air Quality Plan (2011-2020) ▶	●		●	
Promoting living terraces and green roofs in Barcelona (2014) ▶	●	●		●
Eliminating the use of glyphosate in Barcelona's green spaces and the public highway (2015) ▶		●		
Barcelona Air Quality Improvement Plan (2015-2018) ▶	●	●	●	●
Programme of anti-air pollution measures (2016) ▶	●	●	●	●
"Filling the streets with life" by creating Superblocks in Barcelona (2016) ▶	●	●	●	●
Urban resilience (2016) ▶	●	●	●	●
Creation of energy advice and basic supply guarantee centres (2016) ▶	●	●	●	●
Transition towards energy sovereignty (2016) ▶	●		●	●
Responsible Consumption Promotion Strategy (2016-2019) ▶	●		●	●
Social and Solidarity Economy Promotion Plan (2016-2019) ▶	●		●	●
Food Policy Promotion Strategy (2016-2019) ▶	●		●	●
Barcelona Zero Waste Strategy (2016-2020) ▶	●			●
Gender Justice Plan (2016-2020) ▶			●	
Barcelona Strategy against the Feminisation of Poverty and Job Insecurity (2016-2024) ▶			●	●
Right to Housing Plan (2016-2025) ▶	●	●	●	●
Drought Protocol (2017) ▶		●	●	●
Programme to Promote the City's Urban Green Infrastructure (2017) ▶		●	●	●
Programme to Promote Solar Power Generation in Barcelona (2017-2019) ▶	●		●	●
Democratising Care (2017-2020) ▶			●	●
Developing the electric vehicle in Barcelona (2018) ▶	●			
Plan for Energy Saving and Improvements in Municipal Buildings (2017-2020) ▶	●			
Tree Master Plan (2017-2037) ▶		●		●
Bicycle Strategy (2018) ▶	●			●
Olympic Port Master Plan (2018) ▶		●		
Cooperation for Social Justice Master Plan (2018-2021) ▶			●	
Strategic Plan for the City's Coastal Areas (2018-2025) ▶		●		●
Action Plan for Preventing the Effects of Heat Waves on Human Health (annual) ▶		●	●	●
Barcelona Municipal Waste Prevention Plan (2019-2024) ▶	●			●
Urban Mobility Plan (2019-2024) ▶	●			●
Barcelona Alternative Water Resources Plan (PLARHAB) (2020) ▶		●	●	
Comprehensive Master Plan for the Barcelona Sewerage and Drainage System (PDISBA) (2020) ▶		●		
Barcelona Science Plan (2020-2030) ▶	●	●		●
Barcelona Neighbourhood Plan (2021-2024) ▶	●	●	●	●
Barcelona Nature Plan (2021-2030) ▶		●	●	●

YEARS



# 4. BARCELONA NOW

## 4.1 BARCELONA IN FIGURES

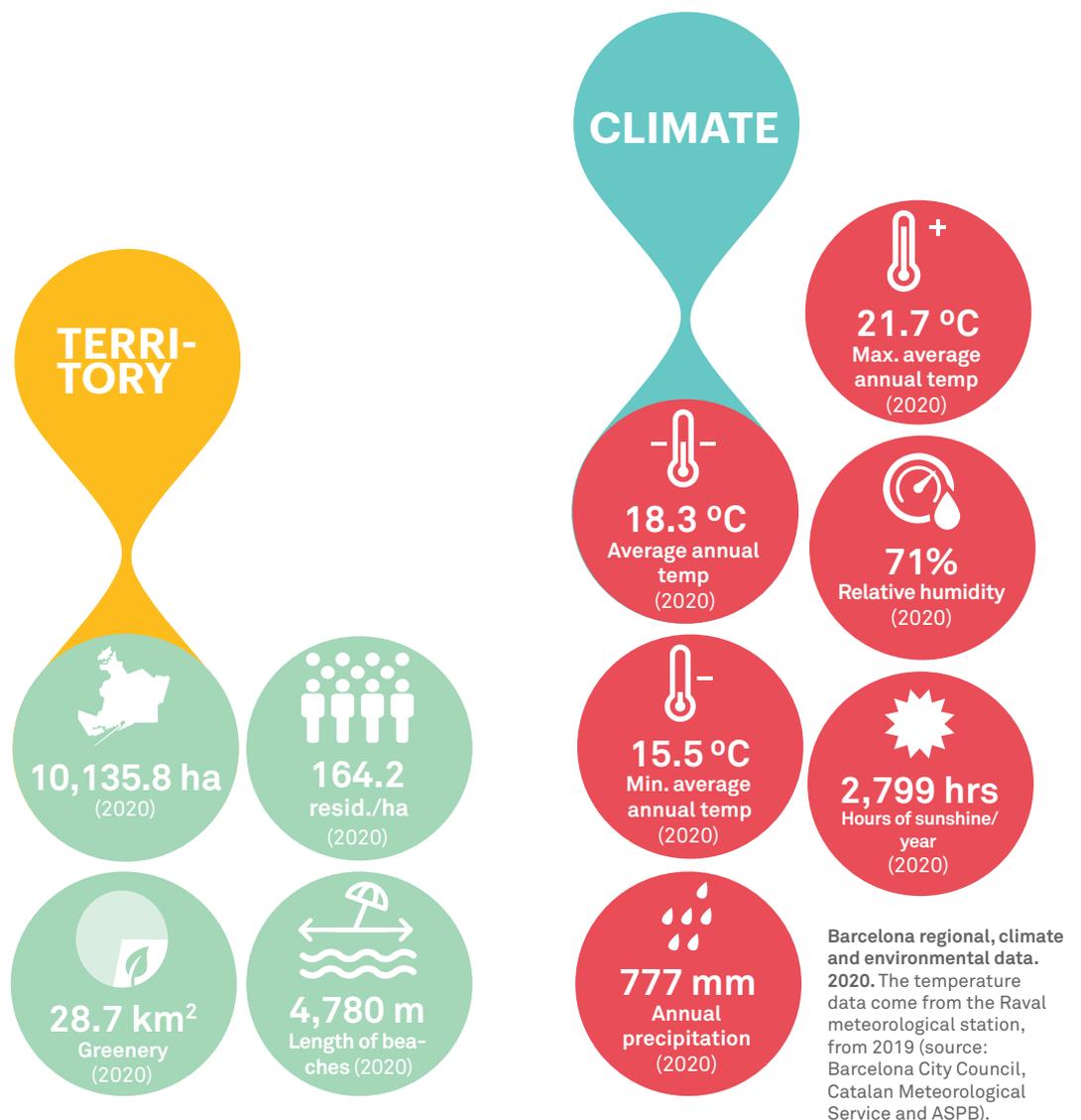
**City between water and mountain**, standing between the Coastal Mountain Range, the Mediterranean Sea, the River Besòs and Montjuïc mountain.

**Compact city**, one of the densest in Europe, with 1.6 million inhabitants in 101.3 km<sup>2</sup> and a metropolitan area of more than 3.2 million inhabitants.

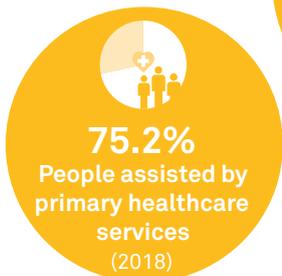
**Mediterranean city**, for its mild climate and its location on the Mediterranean coast, with one of the biggest passenger ports in Europe and the world.

**Service city**, which in the course of a century has gone from an industrial to a tertiary base highly specialised in tourism, doubling its number of visitors in the last decade.

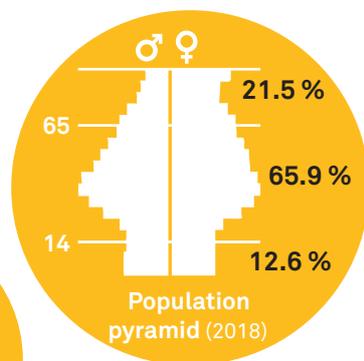
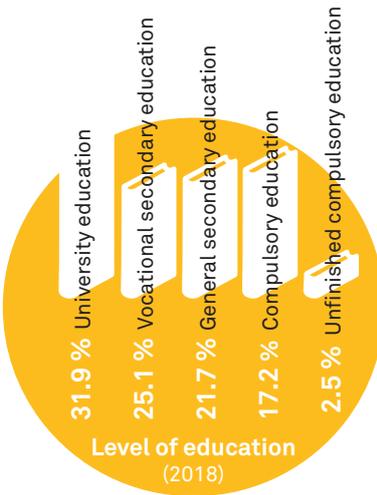
**Economic city and centre**, with an area of influence that spreads beyond the city itself and its metropolitan area to the rest of Catalonia.



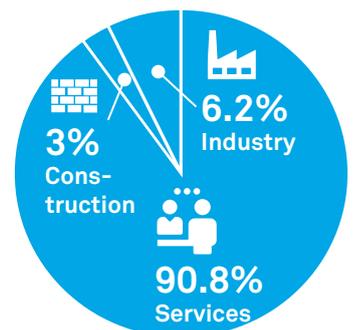
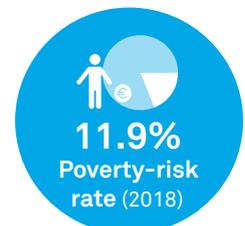
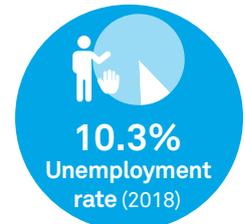
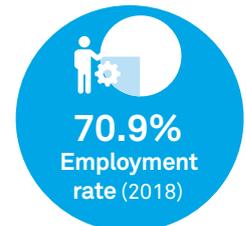
## POPULATION



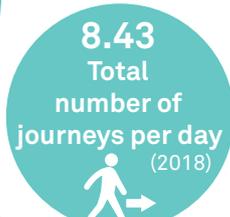
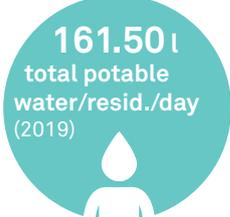
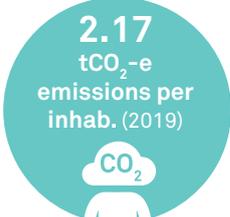
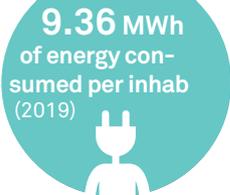
\*Data in which only hotel stays are considered.



## SOCIAL ECONOMIC



# AMBIEN-TALS



Average annual concentrations

## 4.2. MITIGATION, A KEY AREA WE NEED TO KEEP WORKING ON

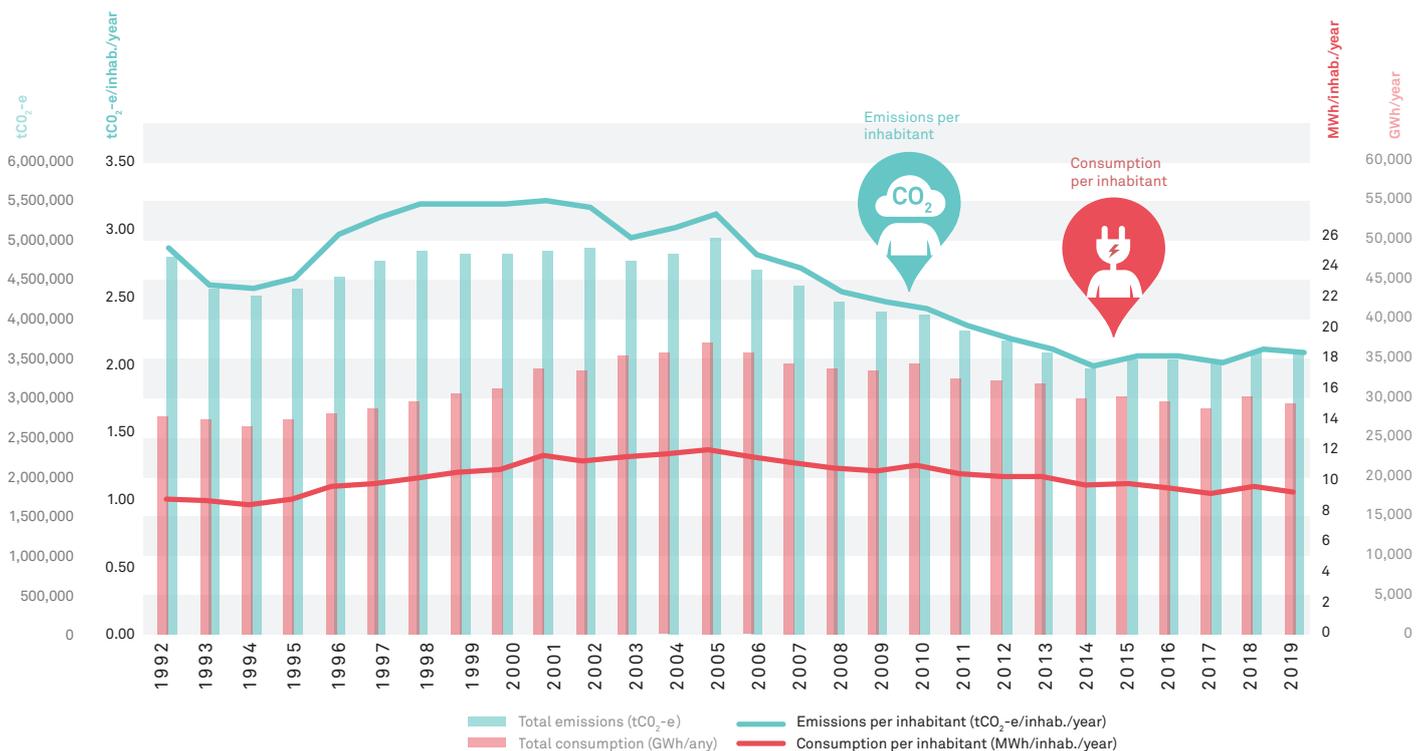
Energy consumption is being maintained and tending to drop, emissions are being contained and energy self-sufficiency is increasing

Energy consumption rose by 6.11% between 1992 and 2019, having peaked in 2005. By contrast, greenhouse gas (GHG) emissions dropped by 25.01% since 1992, having peaked in 2005.

Barcelona's **energy intensity** (which enables GDP increases to be measured against energy consumption), **fell from 261.64 Wh/€ in 1999 to 175.29 Wh/€ in 2019** (and there are not enough data to make such a calculation for 1992). This meant the city was able to consume less energy per euro generated. The trend seems set to continue.

### ENERGY CONSUMPTION AND GHG EMISSION TRENDS IN BARCELONA

Source: Barcelona Energy Report 2014. Barcelona Energy Agency (Barcelona City Council).

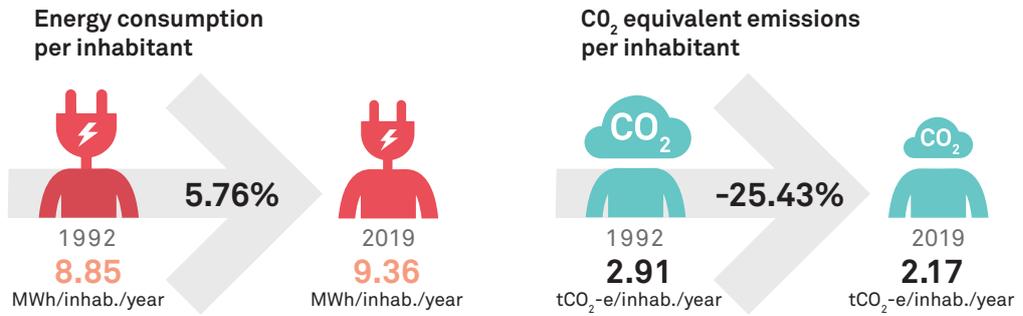


Barcelona consumed 15,321 GWh of final energy in 2019, the equivalent of 9,36 MWh on average per resident.

Considering Catalonia's electric mix 2019, greenhouse gas emissions in Barcelona came to 3,557,000 tonnes of CO<sub>2</sub>-e (2.17 t CO<sub>2</sub>-e/resid.)

## ENERGY CONSUMPTION AND GHG EMISSION TRENDS IN BARCELONA

Source: Barcelona Energy Report 2019. Barcelona Energy Agency (Barcelona City Council).



## HOW DOES BARCELONA CONSUME ENERGY AND EMIT GHGS?

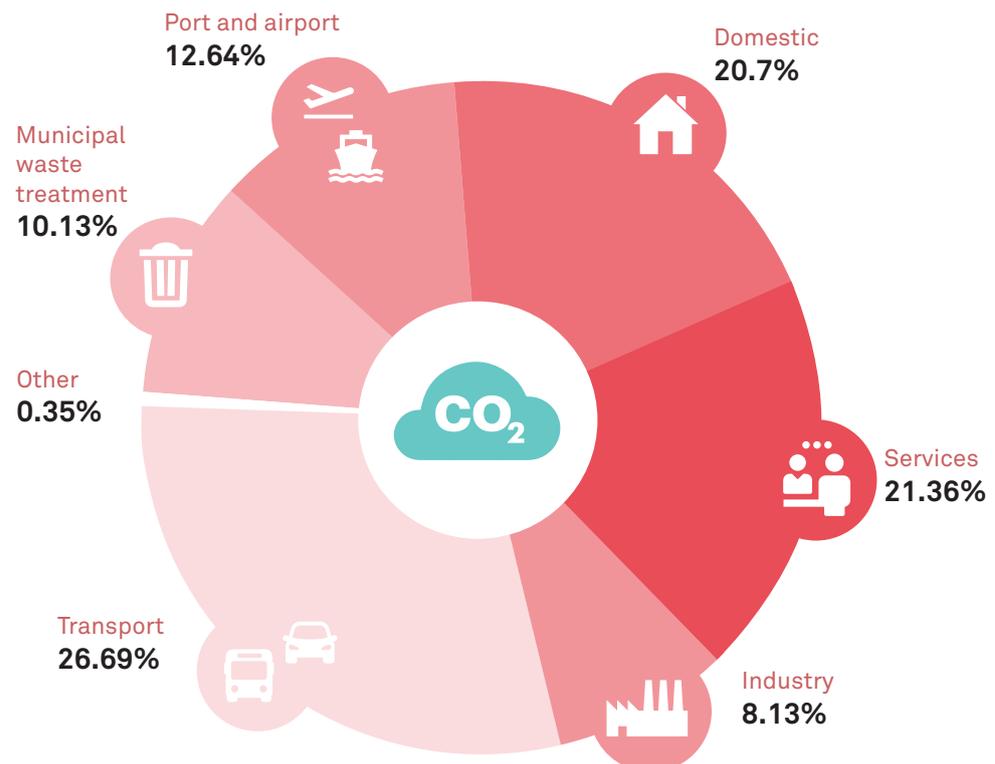
According to the figures for 2019, the biggest consumers of energy are the commercial and service sectors, closely followed by the domestic and transport sectors, with industry and other sectors further behind. The order is different for GHG emissions, where transport is the big emitter, contributing 27% of the total.

Reducing emissions has to be tackled from every sector, but above all from the transport sector (responsible for nearly 26.7% of all emissions), the domestic sector (20.70%) and services sector (21.36%). These are emissions

counted on a city level, but the activity of some infrastructures such as the port and airport also have a big impact. An approximate calculation has been made of the emissions produced by the port and airport — the big transport infrastructures — and the figures are higher than those currently allocated to a city with such infrastructures. It is estimated that they could be four times those counted at a city level, which is why taking joint responsibility for these infrastructures with climate action is key.

## CO<sub>2</sub>-e EMISSIONS BY SECTOR

Source: Original, based on data from the Barcelona Energy Assessment 2019. Barcelona Energy Agency (Barcelona City Council).



## A MIX WITH FEW RENEWABLES

Of the total final energy consumed in the city in 2019, 50.3% came from fossil fuels, 44.9% from nuclear energy, and a mere 4.8% from renewable energies (according to the Catalan *mix*). As for forms of energy consumed in Barcelona in 2019, 45.5% came from electricity, 31.7% from natural gas, 21.8% automotive fuel and 1% liquefied petroleum gas (LGP).

As for source of electricity, 55.1% of what we consume comes from nuclear power (which is why the Barcelona *mix* shows a low emission rate). **Renewable sources**

**only account for 17.1% of the electricity Barcelona consumes.**

In 2017, **357.65 GWh** were generated using renewable sources and harnessing local residual energy. The main source of renewable and residual energies comes from the recovery of urban solid waste at the **Sant Adrià de Besòs plant (54%) and thermal solar power (15%)**. Barcelona's contribution, then, can still grow and therefore features in the goals of the Climate Plan and Climate Emergency Declaration.

### FINAL ENERGY SOURCES ACCORDING TO THE CATALAN MIX

Source: Original, based on data from the Barcelona Energy Assessment 2019. Barcelona Energy Agency (Barcelona City Council).

#### FOSSIL FUELS (TOTAL) 69.2 %

Natural gas (combined gas cycle + direct distribution): 41.7 %

Liquid fuels: 21.2 %

Fuel/gas with co-generation: 5.1 %

Fuel/gas with co-generation: 1.0 %

Fuel/gas: 0.2 %



#### RENEWABLES (TOTAL) 7.5 %

Hydropower and other renewables: 3.8 %

Wind power: 3.0 %

Solar power: 0.4 %

Municipal and industrial waste: 0.3 %

#### NUCLEAR ENERGY 23.4 %

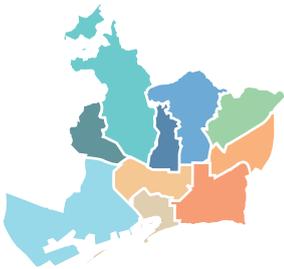
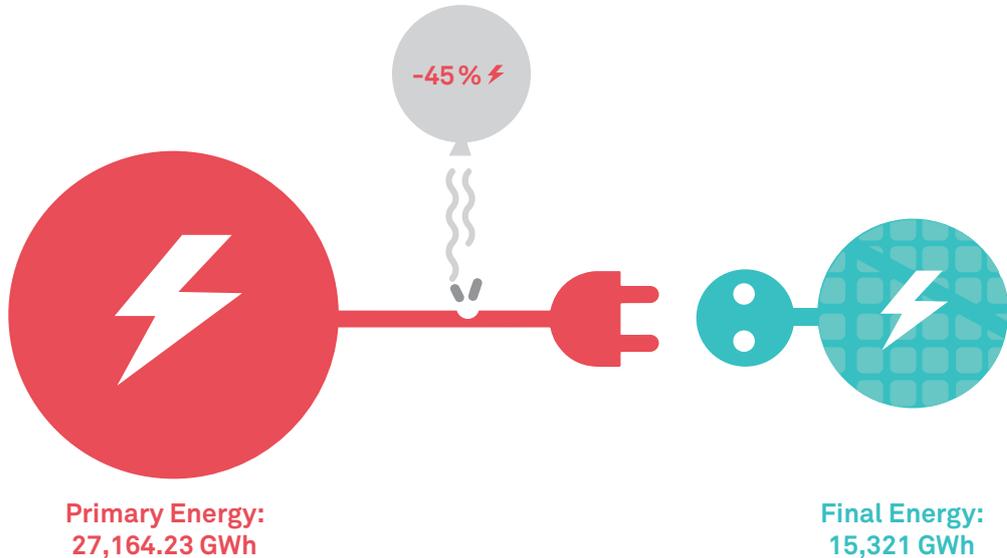
## EFFICIENCY OF THE GENERATION SYSTEM AND TRANSPORT

A total of 15,321 GWh of primary energy were required to provide the 27,164.23 GWh of final energy that Barcelona consumed in 2019. That means

only 55% of the primary energy was transformed into useful final energy, in other words, **45% of the primary energy was lost in generation and transport.**

### EFFICIENCY OF THE GENERATION SYSTEM AND TRANSPORT

Source: 2019 Barcelona Energy Assessment. Barcelona Energy Agency.



### 4.3. CLIMATE CRISIS AND VULNERABILITIES

Climate change affects the population's health in various ways and is considered the greatest threat to health this century. The effects of climate change on health are classed under two categories<sup>1</sup>:

- Direct effects: They include **effects that result from exposure to extreme climatic events** such as droughts, floods, heat waves, storms and fires. The effect on health is expressed as a rise in the number of respiratory and cardiovascular diseases, as well as overall number of injuries and deaths.
- Indirect effects: these are caused by **ecological and environmental changes as well as social changes, which have an impact on health.** They include, then, not just effects of changes in air quality, the availability and quality of water for consumption and food and the rising number of vector-transmitted diseases but also effects arising from population migration, changes in living and working conditions and increases in social inequalities.

<sup>1</sup> World Health Organization, COP24 Special report: Health and Climate Change, WHO 2018. 51

## HEAT AND HEALTH

### EFFECTS ON MORTALITY AND MORBIDITY

Sustained, excessive heat leads to an increase in mortality and morbidity, above all among the **most vulnerable groups\***. The main vulnerable groups are elderly and fragile people, as well as newborn babies, people with physical or learning disabilities and limited mobility or who are unable to care for themselves, people with chronic illnesses, people taking medication that acts on their central nervous system and people living in socially precarious situations. It is not just daytime heat that affects our health; increased night-time temperatures make it harder for us to rest and recover. What is more, it has been observed that night-time heat in Barcelona is associated with a higher mortality from natural, cardiovascular and respiratory causes. More specifically, when night-temperatures rise above 23 °C, the risk of mortality increases significantly<sup>2</sup>.

The Barcelona Public Health Agency (ASPB) has estimated the number of natural deaths attributed to extreme heat of people over the age of 25 during the 1992-2015 period to have been 980 men and 2,729 women, with an average of 150 deaths a year. As for heat waves, the one with the greatest impact on mortality in Barcelona was during the summer of 2003, which lasted for 13 days. The studies conducted found that the number of deaths attributable to it ranged between 411 and 665<sup>4, 5, 6</sup>.

**\* People vulnerable to climate change: people directly affected by the effects of climate change, owing to their socio-economic situation, health or age.**

2 D. ROYÉ, "The effects of hot nights on mortality in Barcelona, Spain", *Int J Biometeorol* (2017), 61(12), pp. 2127-2140.

3 M. MARÍ-DELL'OLMO, A. TOBIÁS, A. GÓMEZ-GUTIÉRREZ et al., "Social inequalities in the association between temperature and mortality in a South European context", *International Journal of Public Health* [internet] (26 March 2018) [cited on 4 April 2018]. Available from: <http://link.springer.com/10.1007/s00038-018-1094-6>

4 A. TOBIÁS, P. G. de OLALLA, C. LINARES, M. J. BLEDA, J. A. CAYLÀ, J. Díaz, "Short-term effects of extreme hot summer temperatures on total daily mortality in Barcelona, Spain", *Int J Biometeorol* (2010) 54(2), pp. 115-117.

5 C. BORRELL, M. MARÍ-DELL'OLMO, M. RODRÍGUEZ-SANZ et al., "Socioeconomic position and excess mortality during the heat wave of 2003 in Barcelona", *Eur J Epidemiol.*, (2006), 21(9).

6 J. F. MARTÍNEZ NAVARRO, F. SIMÓN-SORIA i G. LÓPEZ-ABENTE, "Valoración del impacto de la ola de calor del verano de 2003", *Gaceta Sanitaria* (2004).

### HEAT-VULNERABILITY FACTORS

#### Individual factors

The effects of temperatures on mortality are generally unequal and vary according to inequality axes, such as gender, age and socio-economic position.

- **Gender**

**The risks of heat-associated mortality in Barcelona are much higher among women than men.**

For example, if we compare the risk of dying when temperatures are high (95th percentile), compared to temperatures where a minimum mortality is recorded, the risk for women and men increases by 14% and 4% respectively.

These results may be due, on the one hand, to the social conditions of elderly women and, on the other, to differences in thermoregulatory and physiological mechanisms.

- **Age**

**Elderly people are the most susceptible to temperature, and newborns could be too.**

A study conducted in Barcelona which compared how the mortality risk increased when temperatures were extremely hot (99th percentile), compared to when temperatures were high (95th percentile), showed that this increased risk was significant in men over the age of 75 and in women over the age of 65. More specifically, the rise in women was 29% when aged 65 to 74 and rose to 40% when over the age of 85.

- **Socio-economic status**

It has been observed from some studies that **socio-economic status has a modifying effect on the relationship between temperature and mortality**. It was in Barcelona during the summer of 2003, that Borrell et al. (2006) found that the excessive mortality was occurring in women irrespective of level of education, although the increase for some age groups was greater for women with a lower educational level. The fact that mortality was greater in disadvantaged social groups could have been because less air-conditioning was available. It should be borne in mind that air-conditioning in a city such as Barcelona was limited (27% of the people aged 65 or over), although it had risen drastically over the last few years.

explained by people’s physiological acclimatisation and change of habits as well as structural changes such as more households with air-conditioning, better housing conditions and improvements in the population’s state of health<sup>8,9</sup>.

### Territorial factors

Finally, temperatures, individual conditions and the socio-economic and physical contexts differ within the same city and may determine the existence of neighbourhoods (or areas) especially vulnerable to heat (territorial vulnerability).

- **Territorial distribution of heat**

It was observed from an analysis of heat waves in 2012 and 2015 that daytime temperatures were highest in the districts of Les Corts, Esquerra de l’Eixample, Nou Barris and Ciutat Vella. In contrast, the areas with the lowest temperatures were in the coastal area, specifically in the neighbourhoods of Barceloneta and Poblenou, owing to the thermoregulatory effect of the sea. The situation was reversed

### Temporary factors

As for temporary vulnerability, recent studies have shown that **the risk of heat-related deaths during the summer months has dropped over the last few decades**. This can be

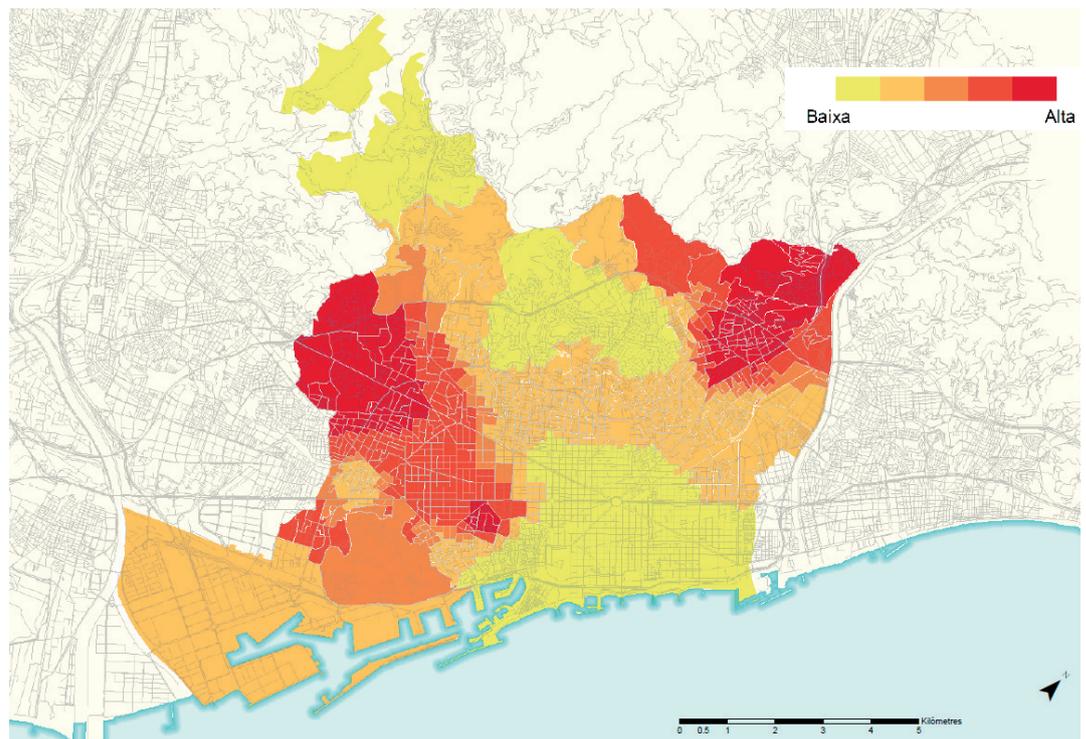
7 O. PRIETO (dir.), *Condicions de vida i hàbits de la gent gran de Barcelona*, Barcelona, Barcelona City Council, 2009.

8 A. GASPARRINI, Y. GUO, M. HASHIZUME et al., “Temporal variation in heat–mortality associations: A multicountry study”, *Environmental Health Perspectives*, (2015) 123(11), p. 1200-1207.

9 H. ACHEBAK, D. DEVOLDER, J. BALLESTER, “Heat-related mortality trends under recent climate warming in Spain: A 36-year observational study”, *PLoS Med*, (2018) 15(7), p. 1-17.

## TEMPERATURE IN THE 2015 HEAT WAVE BY CENSUS SECTION

Source: *Barcelona Regional*, 2017.



at night, however, with the highest temperatures recorded along the coastal belt. **The city centre was the area showing the least variation in high and low temperatures during the day and at night.**

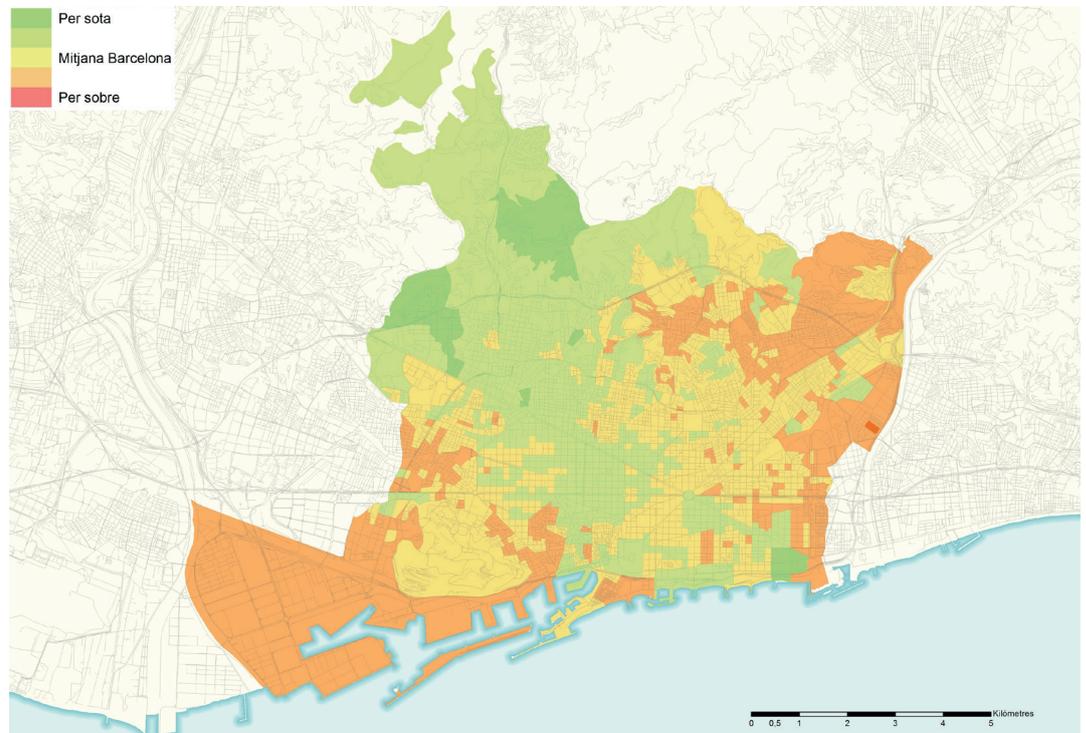
- **Territorial distribution of vulnerability to heat**

A study has been conducted on the city's vulnerability to high temperatures, compiling an index based on **four indicators**

**that could affect heat-related risks to health; these indicators are as follows: members of the population over the age of 75, energy behaviour of buildings according to their demand for cooling, lack of vegetation and the socio-economic indicator of low educational levels.** The most vulnerable areas, if we take these parameters into account, are concentrated in the neighbourhoods near the Besòs sector, part of Horta and most of the Sants-Montjuïc district.

### HEAT WAVE VULNERABILITY MAP OF BARCELONA

Source: Barcelona Regional, 2017.



If we combine the territorial distribution of temperatures according to the heat wave of 2015, and differential effects on the city's neighbourhoods, with vulnerabilities associated with risk parameters, we can create a map of areas with greater priority for action, where the effects on the population are greater. Such a combination would provide a "Heat-wave risk map for 2015", according to which the city's areas worst affected by the heat waves would be in **the**

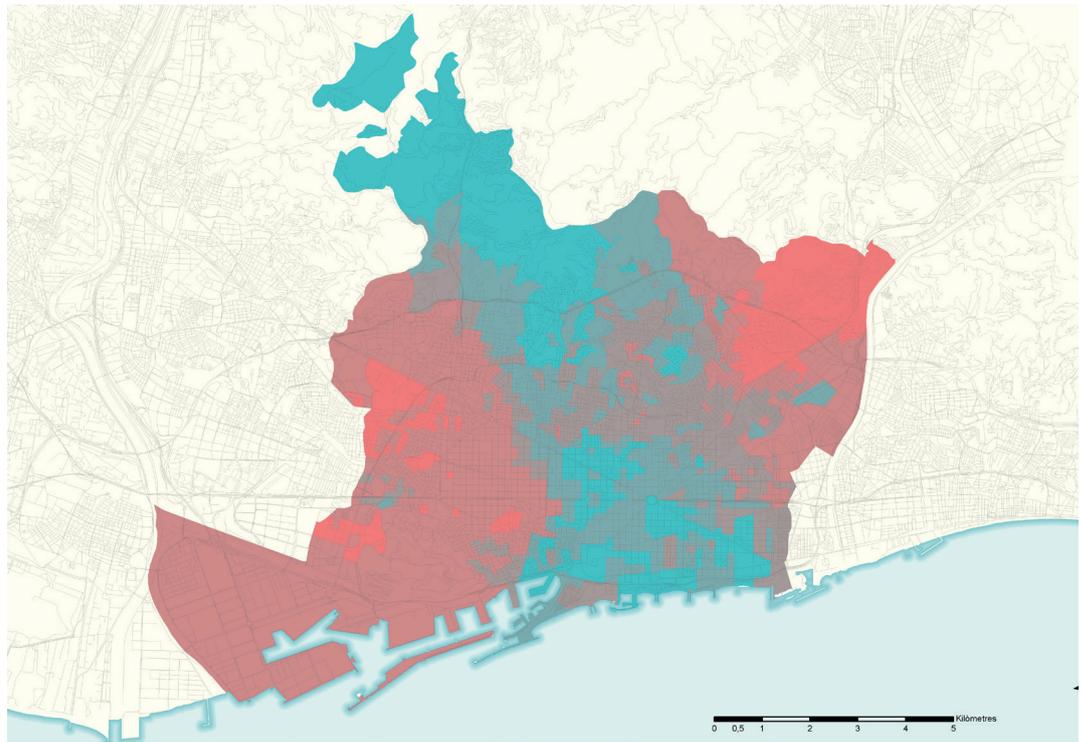
**district of Nou Barris and several areas in the districts of Sants-Montjuïc, Les Corts and Eixample.**

Another study conducted in the Barcelona Metropolitan Area determined that **the risk of mortality due to heat increased in the areas with the largest percentage of old buildings, a higher rate of manual workers and lower perception of green areas among residents.**<sup>10</sup>

10Y. XU, P. DADVAND, J. BARRERA-GÓMEZ et al., "Differences on the effect of heat waves on mortality by sociodemographic and urban landscape characteristics", *Journal of Epidemiology and Community Health*, (2013), 67(6).

**RISK MAP OF THE 2015 HEAT WAVE, CROSS-CHECKING INFORMATION ON THE HEAT SUFFERED IN THE AREA IN 2015 WITH THE VARIOUS FACTORS ANALYSED**

Source: Barcelona Regional, 2017.



- \* Energy poverty: The inability of a household to meet its members' basic energy and water needs, such as:
  - Keeping their home in heating and cooling conditions suitable for their health (from 18°C to 20°C in winter and 25°C in summer).
  - Not having the minimum amount of potable water available (100 litres per person per day).

**ENERGY POVERTY**

**Energy poverty and climate change**

Energy poverty is a complex phenomenon that can be defined as **the inability of a household to secure a socially and materially required level\* of energy services in the home.** In the European context, the most direct cause of energy poverty is the interaction between high energy prices, low energy efficiency in households and electrical appliances and low incomes<sup>11, 12</sup>.

The main effects of climate change (more heat, less water) will also lead to changes in energy-consumption patterns: it is anticipated that there will be a fall in demand for heating, and, by contrast, a rise in demand for water and cooling in homes. Climate change could cause price variations for water, energy and food, no doubt upwards, and impede access to these basic resources. On the other hand, given the city's demographic and socio-economic dynamics, climate change is expected to cause a rise in numbers of vulnerable members of the population and a concomitant increase in energy poverty, which would also result in greater vulnerability to the effects of high temperatures on health.

**Energy poverty in Barcelona**

At present, energy poverty affects 10.6% of Barcelona's population, which corresponds to some 69,500 households. 9.4% and 11.4% of the population say they are unable to keep their home at a suitable temperature during the cold months and hottest months respectively, while 13.9% say they are behind on their utility and service payments (gas, water, electricity, community) and 9.7% say they have leaks and damp in their home. These percentages are higher among the most disadvantaged, at 16.4%, 18.6%, 20.3% and 12.4% respectively.

**Due to structural gender inequalities, women have greater difficulty finding decent housing and meeting the costs of basic utilities.** 70% of the financial aid granted in Barcelona for energy poverty in 2015 had been requested by women and it has been shown that single-mother families have a 43% risk of not being able to access basic utilities<sup>13</sup>. **Another collective especially vulnerable to the effects of energy poverty are children.** It is estimated that 15% of households with children in Barcelona are unable to keep their home at a suitable temperature during

11 Bouzarovski S, Petrova S. A global perspective on domestic energy deprivation: Overcoming the energy poverty-fuel poverty binary. *Energy Res Soc Sci.* 2015;10:31–40.

12 Boardman B. *Fuel poverty: from cold homes to affordable warmth.* Belhaven Press London; 1991.

13 *Radiografies de la situació del dret a l'habitatge, la pobresa energètica i el seu impacte en la salut a Barcelona,* Irene Gonzalez, 2018.

the coldest months, a figure which rises to 30% in Ciutat Vella and Nou Barris.<sup>14</sup>

To tackle this problem in Barcelona, eleven energy-advice points (PAEs) have been opened, coordinated vulnerable-household detection protocols have

been launched and financial aid has been approved for renovating dwellings for people in vulnerable situations. The profiles of the people attended to at PAEs are as follows:

14 *Precarietat energètica i infància a la ciutat de Barcelona*, Enginyeria sense Fronteres, February 2020.

### PROFILE OF PEOPLE ASSISTED UNDER THE BARCELONA LOCAL SUSTAINABLE ENERGY ACTION PLANS

Source: *Barcelona Regional*, 2017.



**67%**

of the people attended to were women



**39.5%**

of households received warnings of utility-supply cuts



**65%**

of the people attended to were tenants



**50%**

of the households included minors



**62%**

of the households attended to suffered from one of the energy-poverty indicators



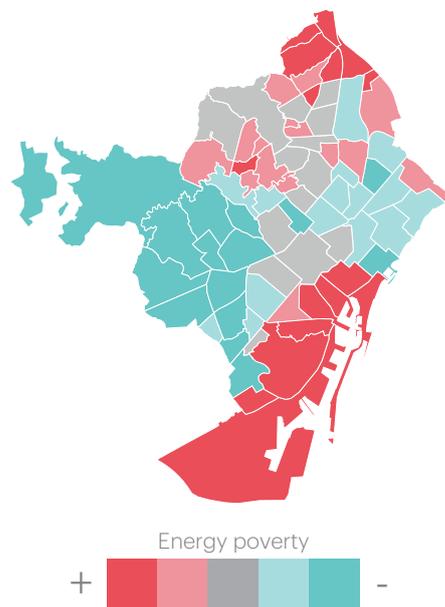
**6%**

were at risk of severe energy poverty

The results generated by the project led by the ASPB entitled “Pobresa energètica i salut (PENSA)” [Energy Poverty and Health] demonstrated that energy poverty varied between Barcelona’s various neighbourhoods, as shown in the neighbourhood-distribution map of an energy poverty index that was obtained by combining six related indicators. The higher the index value, the higher the level of energy poverty in the neighbourhood. According to this index, the three neighbourhoods most affected by energy poverty were Ciutat Meridiana, Vallbona and Baró de Viver.

**DISTRIBUTION MAP ACCORDING TO NEIGHBOURHOOD OF THE GEOGRAPHICAL ENERGY-POVERTY INDEX.**

Source: Barcelona Public Health Agency, PENSA project.



**Energy poverty and health in Barcelona**

**Energy poverty has direct negative effects on people’s physical and mental health** and indirect effects on health and well-being, as it makes it harder for people to perform their daily tasks such as care work, remunerated work and studies, and may have social consequences such as stigmatisation or reduced social interaction.

The results generated by the PENSA project<sup>15</sup> show how people in a situation of energy poverty in Barcelona have worse self-perceived health, worse mental health and greater morbidity and make greater use of the health services and medicines. For example, 45.3% of women in a situation of energy poverty

report poor self-perceived health, a percentage that drops to 21.2% in the case of women without energy poverty. In men, these percentages are 30.1% and 15.2%, respectively. As for mental health, 38% of women in a situation of energy poverty report poor self-perceived mental health, a percentage that drops to 17.5% in the case of women without energy poverty. In men, these percentages are 33.9% and 14%, respectively.

**VECTORS AND DISEASES**

**One of the anticipated effects of climate change is alteration of the geographic and seasonal distributions of vectors and the diseases they transmit**, which may cause more intense and longer-lasting transmission seasons. We know that 60% of the organisms that are infectious to humans are responsible for zoonotic diseases and 80% of these diseases are transmitted by pest vectors, such as ticks, flees and mosquitoes.

The arrival in 2004 of the tiger mosquito (*Aedes albopictus*) to our shores and its subsequent spread has change the epidemiological scenario of some diseases, specifically dengue fever, infection from the Zika virus and infection from the Chikungunya virus, given that we never had a vector until now that was capable of transmitting them.

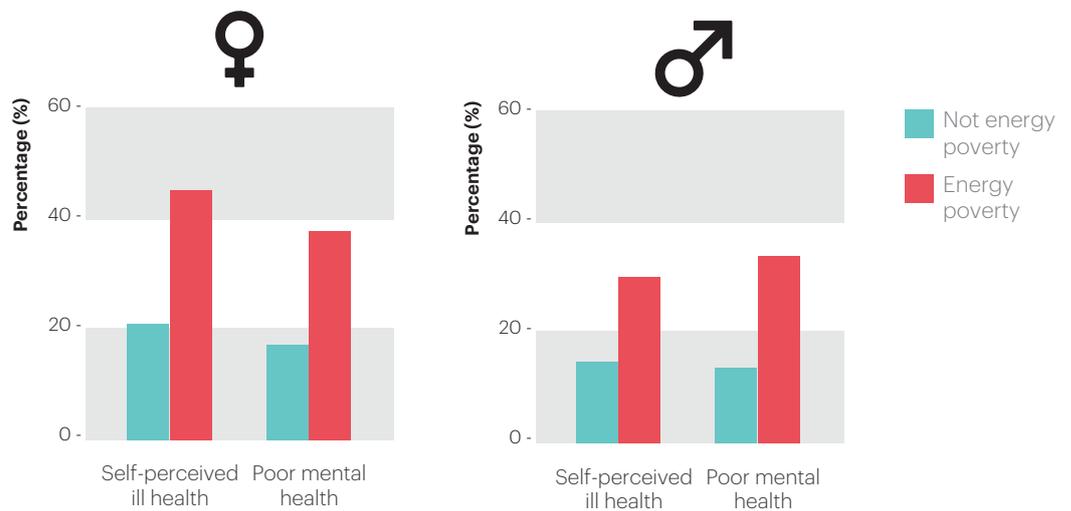
The first autochthonous cases of dengue fever in Spain were identified in 2018, a total of six of which were confirmed, five in Murcia and one in the province of Barcelona. In 2019 there was only one case of an autochthonous vectorial transmission, and that was in Catalonia.

Likewise, the presence of other urban vectors deserves special attention, given the recent rise in their incidence. Here the common mosquito, sand flies, ticks and murids can cause several diseases with an impact on public health such as the West Nile virus, Crimean-Congo haemorrhagic fever virus, leptospirosis and leishmaniasis, and which require surveillance and control measures to reduce their risks to the population.

15 L. OLIVERAS, L. ARTAZCOZ, C. BORRELL, L. PALÈNCIA, M. J. LÓPEZ, M. GOTSSENS, A. PERALTA, M. MARÍ-DELL’OLMO (2020), “The association of energy poverty with health, health care utilisation and medication use in southern Europe”, *SSM - Population Health*. <https://doi.org/https://doi.org/10.1016/j.ssmph.2020.100665>

**PERCENTAGE OF HEALTH PROBLEMS AMONG PEOPLE SUFFERING FROM OR FREE OF AN ENERGY-POVERTY SITUATION.**

Source: Barcelona Public Health Agency, PENSA project.



Due to changes in temperatures, precipitations and humidity, these insects can expand the geographical area their populations live in, increasing their distribution area, so that they can enhance their reproduction capacities and go through more life cycles in less time, thereby encouraging their proliferation and making them an infectious vector within a shorter period of time.

To respond to these threats, the ASPB has been implementing **urban pest surveillance and control programmes and epidemiological surveillance programmes**.

**AIR QUALITY, CLIMATE AND HEALTH**

**Climate, air pollution and health are linked together in a complex way.** Climate change and atmospheric pollution share many of the sources of emissions that cause them. On a global level, climate change causes a worsening of air quality (WHO, 2018). In Barcelona's case, the forecasts indicate that **the effects of climate change could lead to an increase in the annual concentration of three atmospheric pollutants: particles, NO<sub>2</sub> and, to a lesser extent, O<sub>3</sub>.** These pollutants have a harmful effect on the health of the population and air pollution in Barcelona is a serious public-health problem.

The main impact of air pollution on health in Barcelona, resulting from chronic exposure to the usual pollution levels is a worsening of cardiovascular and respiratory diseases, lung cancer and total mortality.

**OTHER EFFECTS OF CLIMATE CHANGE ON HEALTH**

**Water quality and availability**

It is estimated that climate change will reduce the global quantity of precipitation and increase the number and seriousness of extreme climatic events such as droughts and torrential rain. Such climate changes cause a **reduction in existing water resources, change their quality and threaten the health guarantee required for water consumption** (UNESCO, 2011). Barcelona suffers from recurring episodes of drought that have been turning potable water into a very valuable resource and putting at risk the city's capacity to supply water.

Climate change is associated with an increase in the number and diversity of pathogens in water, as well as an increase in incidents involving these associated infectious diseases (Epstein, 2001). Recent investments in the treatment systems that supply the city with water seem a good starting point for taking on the challenges relating to the scarcity and quality of drinking

water in the city. Despite that, we need to continue monitoring the quality of our drinking water and check that it is not altered during periods of heavy rainfall or drought.

## Food

**Climate change and our food are connected.** On the one hand, climate change can have an indirect effect on food through its potential impact on ecosystems and the environment, causing a change to or reduction in food production, and also on food prices and availability, thereby affecting nutritional states and child and adult health. On the other hand, food production is one of the main factors that contribute to climate change: agriculture contributes directly to greenhouse gas emissions, the global production model has also been increasing emissions, due to the transport of products, and displacing traditional local consumption, and the growing presence of meat in our diet is bringing about higher levels of greenhouse gas emissions from livestock.

The Lancet Commission has defined the *global syndemic* as a combination of three pandemics — obesity, undernutrition and climate change — which affects most people in all the world's countries and regions. A healthy diet (500 g of fruit and vegetables and 500 g of legumes and other vegetables every day) play a vital role in reducing

obesity rates and risks of serious illnesses in adulthood. Even so, 10% of children aged 3 to 4 in Barcelona are obese. That is why it is essential for people to have access to a sustainable, sufficient and suitable diet, with healthy habits.

## Motorised mobility

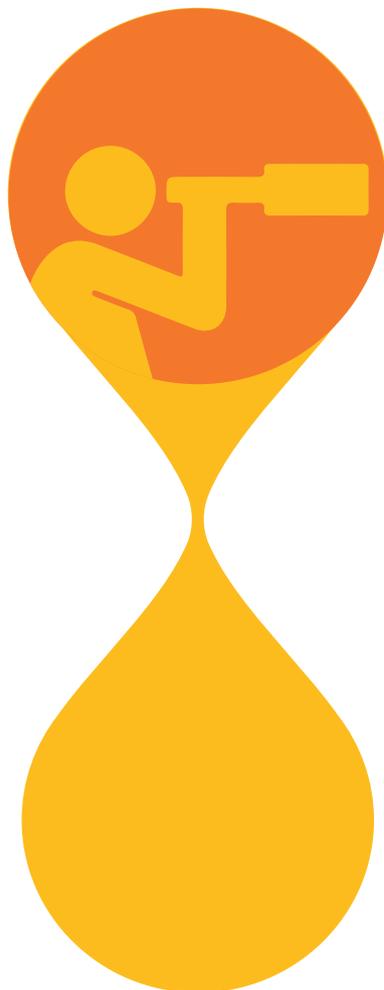
Motorised transport has a direct impact not just on greenhouse gas emissions but also on the health of the population, owing to the emission of pollutants into the air, the noise generated by vehicles, the injuries caused in traffic collisions and the lack of physical activity due to the presence of unsafe or hostile environments.

## Mental health

Natural disasters and the rise in the number of infectious diseases — associated with climate change — can cause anxiety, psychological or post-traumatic stress, severe depression and somatisation. In fact, many of the recent newcomers are climate refugees, who have suffered an intense trauma in the process, with potential long-term effects. In addition, heat and heat waves can trigger or worsen various mental illnesses. What is more, some medicines can interfere with thermoregulation and thereby increase a person's vulnerability to heat.



# 5. BARCELONA IN THE FUTURE



## 5.1. WHAT WILL BARCELONA'S CLIMATE BE LIKE IN THE FUTURE?

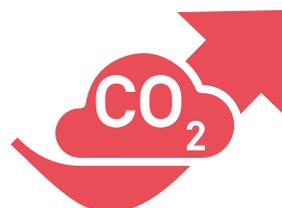
Reducing emissions may be a global commitment, but the effects of failing to meet it are local. Hence our analysis of how climate change may affect Barcelona, based on Catalan Meteorological Service forecasts and focusing on two possible scenarios: the committed scenario or RCP4.5 and the passive scenario or RCP8.5.

These two scenarios were also studied in the RESCCUE (Resilience to cope with Climate Change in Urban Areas) European project by the Climate Research Foundation (FIC). This research centre has carried out simulations of ten global models for the Barcelona region. The results obtained reaffirm the upward trend of average temperatures by **1.7 °C towards the end of the century for the RCP4.5 scenario and an increase of up to 4.5 °C towards the end of the century for the RCP8.5 scenario.**



### 1. COMMITTED SCENARIO (or RCP4.5)

A more **committed** scenario (aka RCP4.5), in which the 2015 Paris Agreement emission reduction targets are achieved. In this scenario, the concentration of GHGs would be higher than now at the end of the century but the increase would be reduced from 2030 onwards, in order to restrict the maximum rise in the overall temperature of the planet to 1.5 - 2°C.



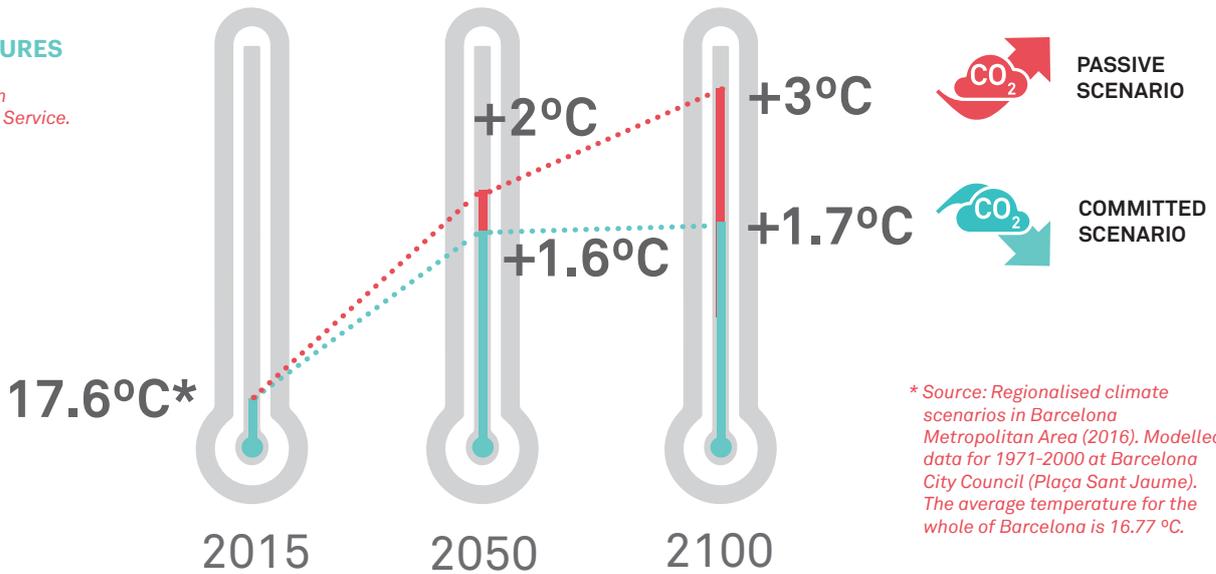
### 2. PASSIVE SCENARIO (or RCP8.5)

A more **passive** scenario (aka RCP8.5) which represents a situation in which the targets set in Paris are not reached, so the GHG concentrations at the end of the century would be much higher than present levels. The increase in global temperature would be considerably higher than 2°C.

More specifically, a rise in temperatures is forecast in Barcelona's case, and a downward trend in rainfall:

## RISE IN TEMPERATURES

Source: Catalan Meteorological Service.



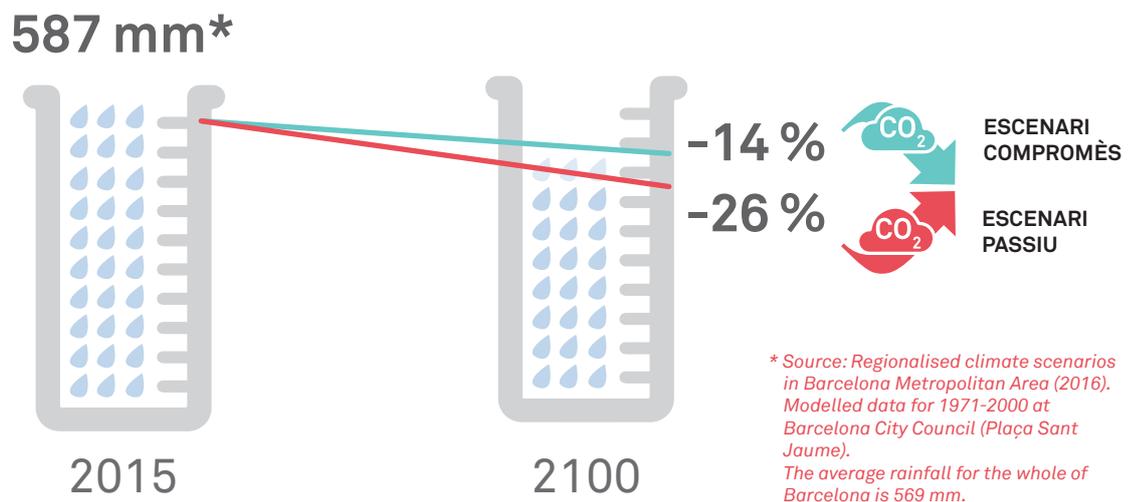
Note that the increase in average temperatures will be very pronounced in the summer. According to the RESCCUE project's results, average summer temperatures could rise by 3 °C in the committed scenario by the end of the century and by 5.5 °C (up to a maximum of 8.5 °C) in the passive scenario by the end of the century. On the other hand, higher winter temperatures of 1.5 °C and 3 °C are expected by the end of the century for the passive and committed scenarios respectively. This will lead to much milder winters than those at present.

According to climate change scenarios analysed, the expectation in both the committed scenario (reduction of greenhouse gas emissions according to the Paris Agreement) and the passive scenarios (no reduction in emissions)

is a **reduction in accumulated rainfall in the city of between 14% and 26% towards the end of the century.** The studies carried out within the framework of the RESCCUE project confirm this downward trend of precipitation in our region. Despite it being a phenomenon with a high associated degree of uncertainty, **the modelling carried out by the FIC predicted a 15% drop in precipitation by the end of the century for the RCP4.5 scenario and a possible drop of as much as 30% by the end of the century for the RCP8.5 scenario.** This reduction in water resources could be **worsened by increased winds (up to 0.5 m/s) and plant evapotranspiration (between 14% and 27%),** situations that would reduce the availability of water in contributing basins.

## FALL IN RAINFALL

Catalan Meteorological Service.



## 5.2. THE MAIN EFFECTS OF CLIMATE CHANGE ON BARCELONA

Climate change is anticipated to lead to a worsening of people's living and working conditions and an increase in social inequalities, migration and conflicts.

### PEOPLE'S HEALTH AND SURVIVAL:

- Heat has a direct effect on mortality, mainly on the elderly and the vulnerable with previous chronic illnesses, among other things.
- Heat has an indirect effect on health owing to changes in food production and the worsening of the quality of air and water.
- Climate change will be accompanied by new disease-bearing vectors, for example, tiger mosquitoes, which can transmit diseases produced by arboviruses, such as dengue, yellow fever, West Nile, chikungunya and Zika viruses

### PEOPLE'S QUALITY OF LIFE AND PUBLIC SAFETY:

- More discomfort due to the heat.
- Need to improve the comfort of homes.
- Need for more friendly public spaces (shade, fountains, cool places).
- Emergency situations caused by heat waves, flooding, drought or fires.

### GUARANTEE OF BASIC SUPPLIES:

- Scarcity of water due to droughts.
- High energy demand due to extreme temperatures.

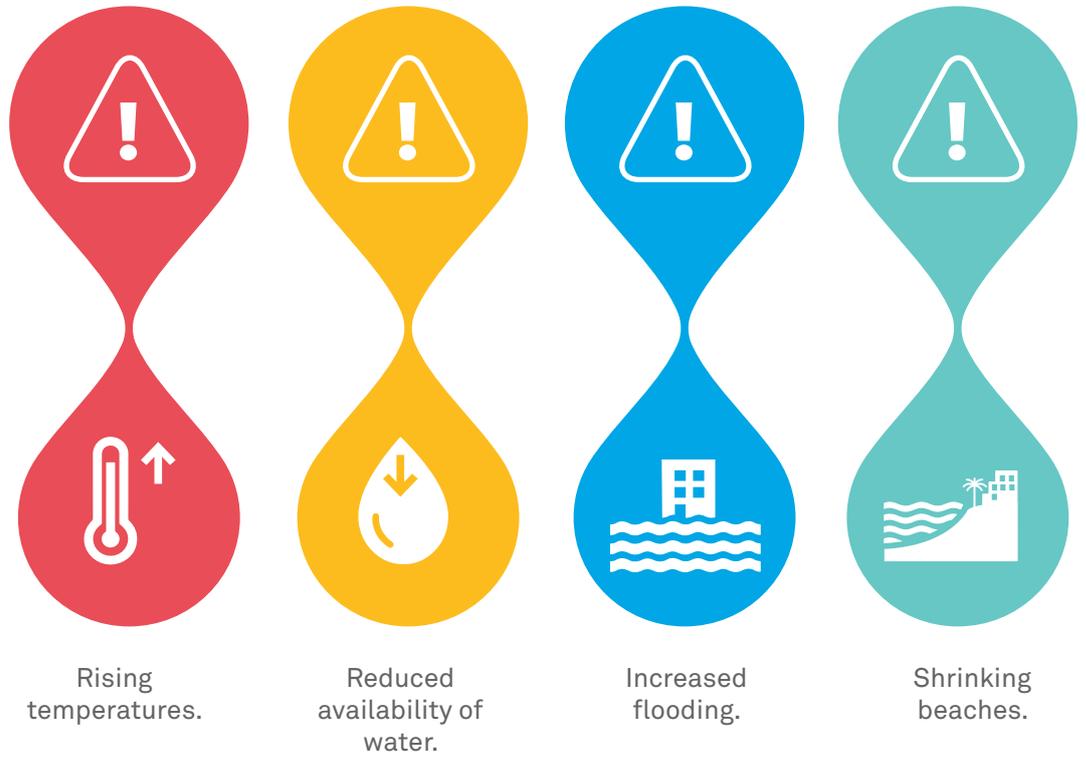
### COST OF LIVING:

- Higher food and water prices.
- More poverty.

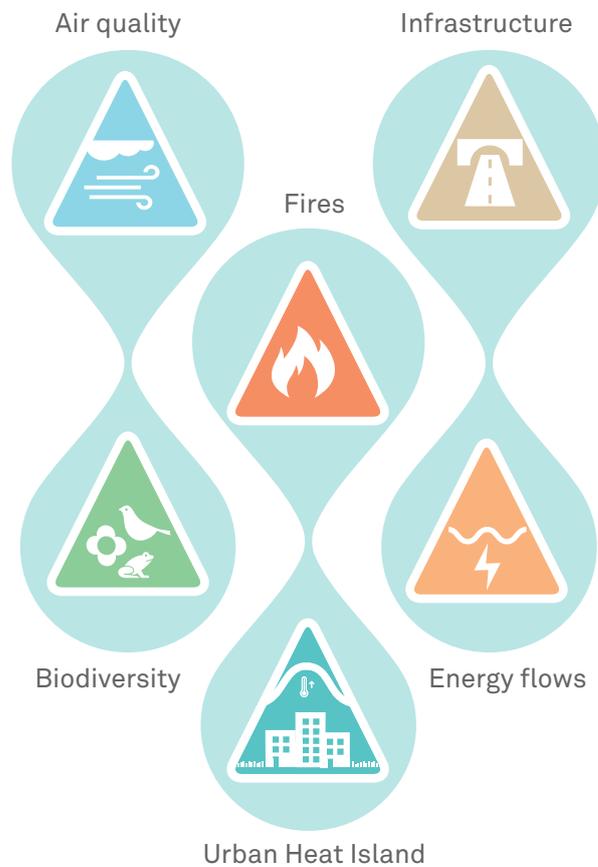
### ENVIRONMENT:

- Disappearance of species and landscapes.
- Appearance of pests and infestations and invasive species.
- Loss of beaches.

The biggest climate change challenges that Barcelona will have to face are:

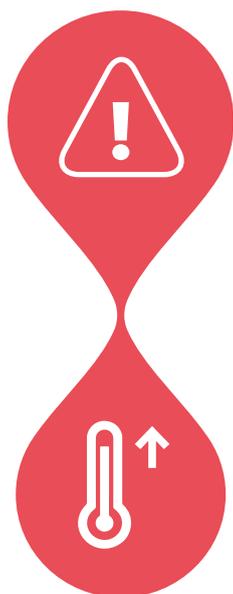


We have also analysed the effect climate change will have on the following aspects:



To view the complete studies, visit the Climate Emergency Action Plan's web page: <http://lameva.barcelona.cat/barcelona-pel-clima>

# INCREASINGLY HOT



## TODAY

There has been a confirmed upward trend in temperatures in Barcelona from the 18th century to the present. The evolution of the annual average temperature has been showing a clear upward trend since the 1990s.

### EVOLUTION OF ANNUAL AVERAGE TEMPERATURE IN BARCELONA (1780-2019).

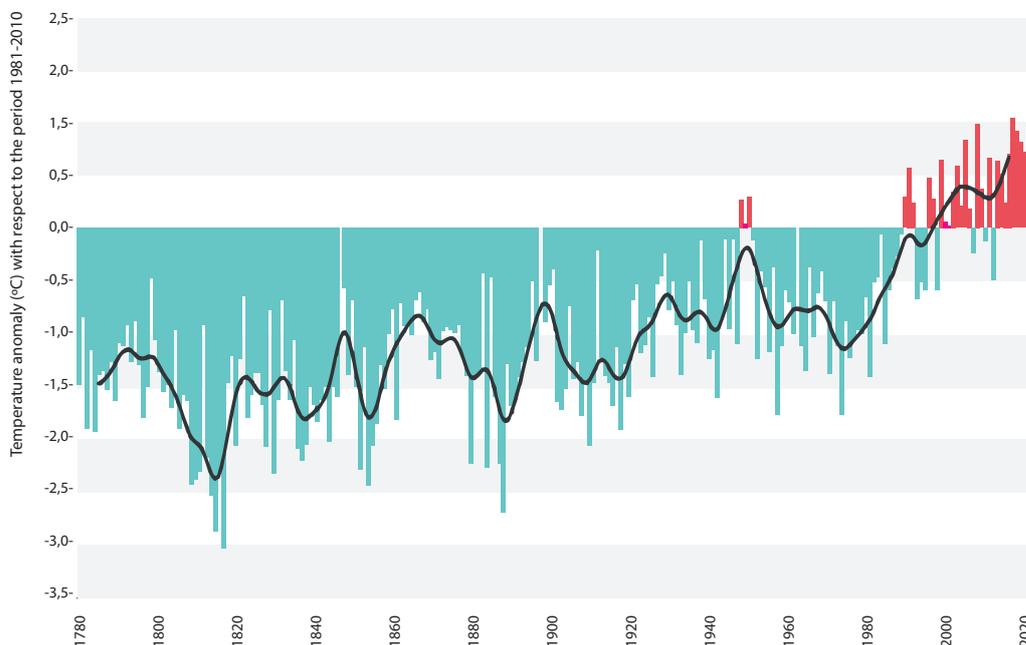
Source: Catalan Meteorological Service.



### VARIATION OF TEMPERATURE (1780-2019).

\*This variation is calculated by comparing the average temperature of each year with regard to the 1981-2010 period

Source: Catalan Meteorological Service.



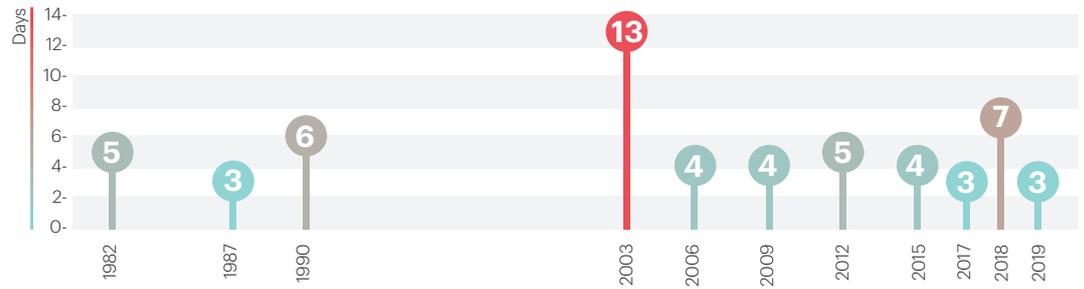
In all, 11 heat waves have been recorded in the city over the last 37 years, with

the last 4 heat waves in the last 5 years.

### DIES DE DURADA DE LES DIFERENTS ONADES DE CALOR\*

\* These heat waves are they calculated taking into account that the threshold temperature is of 33.1°C.

Source: Barcelona Regional a from the information on different heat waves weather stations.



At present, in Barcelona's case, a **heat wave occurs when maximum temperatures rise above 33.6°C for three consecutive days**. This reference

temperature is calculated every year from the average of the temperatures above the 98th percentile of the three hottest months of the year.

### TOMORROW

Rising temperatures will have consequences for health but not just in terms of heat waves. A rise in temperatures at night can also have an impact, as the period of night-time rest is when people recover from the heat during the day.

### MEASURES IMPLEMENTED SO FAR

Barcelona has been working for years to reduce the effects of heat waves in the city by, for example:

- Increasing the quantity and quality of green infrastructure, as this provides shade and cooler temperatures.
- Improving the thermal comfort of public buildings and facilities by means of energy renovation.
- Taking the necessary steps to ensure that people have equal access to energy, setting up the energy advice points (PAE) which offer information and support.
- Approving the Action Plan to Prevent the Effects of Heat Waves on Health (POCS).
- Creation of a network of climate shelters.

Evolution of heat waves, hot and torrid days and tropical and torrid nights from the 1982-2015 period to 2019 (last column) and a comparison with the committed and passive scenarios for the

end of the century. The data from the year 2019 correspond to the average of the Barcelona meteorological stations, not including the Fabra Observatory's average.



Source: Original, based on data from the Catalan Meteorological Service.

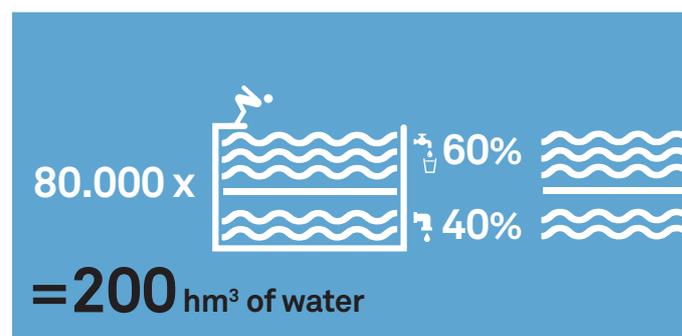
## INCREASINGLY LESS WATER: BARCELONA WILL NEED ADDITIONAL WATER RESOURCES



Barcelona and its metropolitan area are home to most of the population and the majority of economic activities, which cannot cover their potable water needs with their own water resources. Consequently, a large part of the city's

water supply currently comes from the surface resources of other basins. Other supply sources include underground resources, the desalination plant and rainwater.

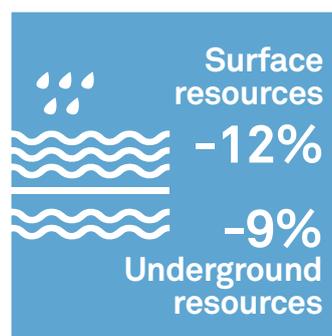
Today (Current situation)



18 hm<sup>3</sup>  
Need for additional  
potable water

Tomorrow (Mid-century)

COMMITTED  
SCENARIO



### TODAY

Some 200 hm<sup>3</sup> of water (80,000 Olympic swimming pools) enters Barcelona every year. 60% of that comes via the potable water system (117 hm<sup>3</sup>), 30% from rainwater and 10% from groundwater for non-potable uses. However, the city currently has a deficit in its water supply system, as the resources are less than, or very close to, the level of demand one year out of every four. At the moment this is being resolved with the reservoir reserves of previous years, but the guaranteed supply is only one year.

### TOMORROW

A slight reduction in water resources, greater variability in its availability and an increase in demand is forecast. More specifically, a 12% reduction in surface resources and a 9% reduction in underground resources is forecast by 2050, along with a 4% increase in demand for different uses. There will therefore be a general need for additional potable water resources in the metropolitan area of 34 hm<sup>3</sup> a year,

with Barcelona's need estimated at 18 hm<sup>3</sup> a year.

In order to obtain the extra water needed it is planned to increase the use of alternative water resources, namely, 2.7 hm<sup>3</sup> of groundwater for all municipal uses that do not require potable water quality, 5 hm<sup>3</sup> of regenerated water for industrial uses and 1.3 hm<sup>3</sup> of grey water in new housing developments and renovation projects, besides exploiting the Besòs aquifer (12 hm<sup>3</sup>) and using rainwater. There is also the desalination plant, which can provide water when necessary.

### MEASURES IMPLEMENTED SO FAR

The following measures have been implemented in recent years to reduce potable water consumption and guarantee the water supply:

- Campaigns and programmes to raise public awareness.
- Reduction of consumption in municipal services (public fountains,

urban green infrastructure management, etc.)

- Use of alternative water resources, especially groundwater, for certain uses (sprinklers, cleaning, ornamental fountains).
- Consolidation and optimisation of the water supply system to prevent leaks.

- Improved system redundancy by linking up the main water tanks.
- Definition of a drought action protocol.
- Drafting a Barcelona Alternative Water Resources Plan.

## INCREASED RISK OF FLOODS



The risk of flooding due to a lack of drainage in Barcelona is shaped by the terrain profile, the high impermeability ratio and the artificialisation of natural water courses. This effect is

increased by the characteristics of the Mediterranean climate where, typically, most rainfall is concentrated in few, high-intensity episodes.

### Today (Current situation)

1959

**45%**  
Impermeable  
surface area



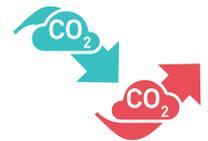
2009

**72%**  
Impermeable  
surface area



### Tomorrow (Mid-century)

COMMITTED  
SCENARIO



PASSIVE  
SCENARIO



### TODAY

The high degree of impermeability in the city means a greater amount of rainwater is turned into runoff. From 1956 to 2009, Barcelona's impermeable surface area increased by over 2,800 ha, from 45% to 72% of the city's total surface area.

The drainage system can currently cope with rainfall that has a 10-year return period (T10), (despite the pressure on some sections).

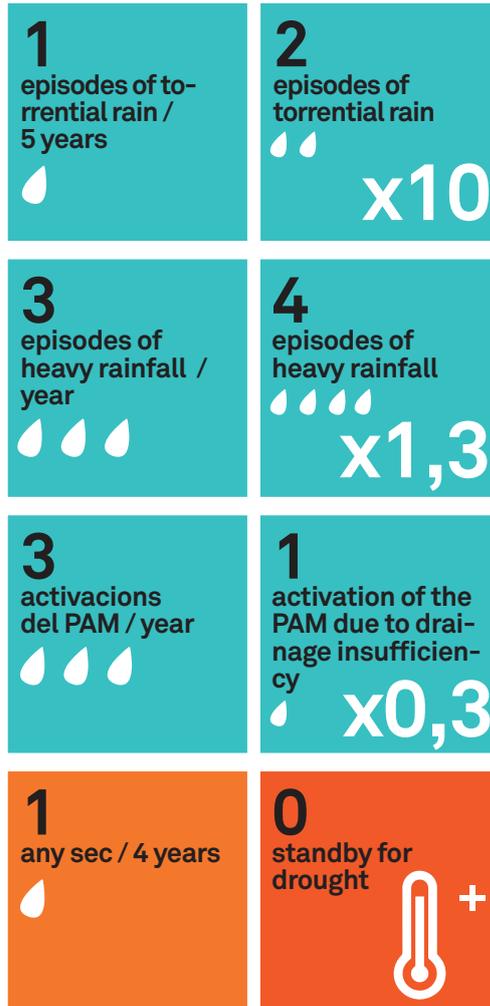
Despite the fact that the trends indicate there will be less annual average rainfall,

when it does rain it will be more intense and concentrated in extreme episodes. This increase in rainfall intensity may cause certain areas of the city to flood, which would put the city's drainage system to the test. **During the last quarter of a century, there have been 8 years where the rainfall has had a 20-minute intensity above 100 mm/hour and 6 years where it has had an at least a 60-minute intensity above 60 mm/h. On average, 4 annual episodes have been recorded of rainfall with a 20-minute intensity above 60 mm/h, causing flooding and disruptions to mobility.**

**HISTORICAL SERIES  
BCASA 1995-2018.**

Source: BCASA.

Historical series  
BCASA 1995-2018. 2020



**TOMORROW**

However, in the two scenarios studied and with the current level of impermeability, the system is expected to overflow at some points. Its fragility is evident in Poblenou, the Diagonal axis, Sant Andreu, Badal and Sant Antoni.

Considering that the current network already presents problems with the existing rainfall system, these problems are expected to get worse in the future as, according to the results of the climate forecasts made in the RESCCUE project, we are going to experience more and more torrential rain events in the city. Rainfall with a 10-year return period is expected to rise by 20% around the middle of the century and by 40% towards the end of the century, whereas rainfall with a 100-year return period will rise by 30% around the middle of this century and by 45% towards the end of this century.

**Measures implemented so far**

Measures implemented in recent years to avoid flooding include the following:

- Construction of 15 rainwater retention tanks that protect the city against intense rain episodes, as well as the quality of the receiving environment.
- Promotion of sustainable urban drainage systems, which operate like natural processes for filtering, storing, infiltrating and evaporating runoff water in a decentralised manner that supplements the network of collectors and large tanks.
- Increasing the city's green surfaces.
- Preparation of the Comprehensive Master Plan for the Barcelona Sewerage and Drainage System (PDISBA).

# SHRINKING CITY BEACHES, DUE TO THE RISE IN SEA LEVEL



Flooding caused by the rise in sea level is calculated by using the flood level. This is determined by three parameters: the localised increase in the average sea level causing permanent flooding; the tide and changes in wind pressure causing potential flooding; and, finally, the swell effect causing extreme flooding. Powerful waves are currently responsible for the major problems on the Barcelona shoreline during extreme storm episodes.

## TODAY

Even in today's conditions, Barcelona's eight beaches are at high risk from sea storms. In fact, 80% of their surface area, apart from Barceloneta, is affected by this risk.

## TOMORROW

As a consequence of climate change, it is expected that there will be more flooding, morphological changes in the beaches and a greater exposure of port infrastructures, although sea passage will not be affected at all under normal wave swell conditions.

A rise in sea levels could lead to coastal recessions in all the city's beaches, as it would bring about a loss of usable sand area for users there. Some beaches, such as the Sant Sebastià, could practically disappear in the worst-case scenarios, while others may

suffer reductions of between 30% and 46%. According to the general climate forecasts, extreme events will become more frequent, though with little change in their magnitude. More specifically, what had previously been associated with 50-year return periods is now expected to be associated with 35-year periods by 2050. Simulations of the various global climate models carried out in the RESCCUE project confirm this sea-level trend of rainfall in the city's coastal area.

## MEASURES IMPLEMENTED SO FAR

In an effort to prevent the loss of sand due to the effect of sea storms and to protect the seafront, dykes have been built and over 700,000 m<sup>3</sup> of sand was brought in under the Barcelona Beach Stabilisation Plan in 2009 and 2010.

Today (Current situation)

Average sea level (0 cm)



Tomorrow (End of century)

COMMITTED SCENARIO



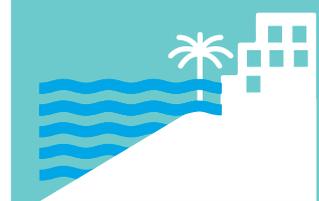
Rise in sea level between +46 cm/+115 cm



PASSIVE SCENARIO



Rise in sea level between +64 cm/+133 cm



## 5.3. OTHER IMPACTS THAT CLIMATE CHANGE HAS



### AIR QUALITY

The projections made so far show the effects of climate change could lead to an increase in the annual concentration of the three pollutants analysed. The biggest increase would be in PM10 particles, medium in NO<sub>2</sub> and much less in O<sub>3</sub>. However, those projections do not take into account that these increases could be offset by the consolidation of new technologies, which mean fewer emissions, nor the reduction in mobility by private transport.

### URBAN HEAT ISLAND

The most intense urban heat island effect in Barcelona presently occurs at night and during winter. Urban monitoring stations register temperatures up to 3°C (annual average) higher than those outside the city but differences of as much as 7 to 8°C have been observed. Climate change will intensify the urban heat island effect, as it will increase exposure to episodes of high temperatures and heat waves, with more serious consequences.

### ENERGY FLOWS

Taking into account consumption in all the sectors (residential, tertiary, transport and industrial), and bearing in mind that climate change will not produce any variation in the latter two, the projections show that in the “committed” scenario the reduction in energy consumption by the end of century will be 6.7% less than current consumption, and in the more “passive” scenario it could be 7.3% less than the current level. Despite the overall reduction in energy consumption, however, a change in the public’s consumption patterns is forecast with an increase in the demand for electricity, mainly due to the need for air conditioning linked to episodes of high temperatures as well as new consumption linked to e-mobility, which would create a bigger need for power distribution infrastructure in the city.



## BIODIVERSITY

Rising temperatures and periods of drought could impact on vegetation in natural areas. The phenology of plants is currently affected and water stress could mean a loss of vitality, the penetration of better-adapted species and make them more vulnerable to suffering from pests and infestations.

In the case of fauna, these changes could affect particularly vulnerable species: fish, amphibians and butterflies. It should be emphasised that some pest species (cockroaches, monk parakeets and murids) could benefit from the change in climatic conditions, as well as some species of mosquito that transmit diseases such as dengue fever, yellow fever, West Nile fever, chikungunya fever and the Zika virus. In general, all these changes could contribute to the simplification of ecosystems and therefore reduce biodiversity.

## FOREST FIRES

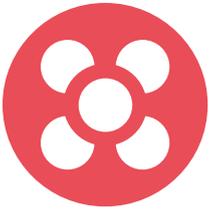
Climate projections show there will be an increased fire risk in the Mediterranean region. Around Barcelona, however, there are other factors associated with human activity, urbanisation processes and changes in land use that bear the main responsibility for fires. Given the rise in temperatures and reduction in rainfall caused by climate change (leading to increased water stress and more highly combustible vegetation), there will be a moderate increase in the fire risk.

The areas of Barcelona where there is, and will be, a bigger risk of fires are mainly on the Barcelona side of Collserola in the Vallvidrera, Tibidabo i les Planes, Horta, Canyelles and Torre Baró neighbourhoods.

## IMPACT ON INFRASTRUCTURES

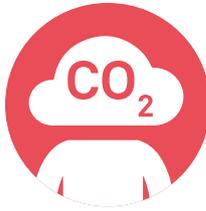
After the beaches, the sanitation and transport systems are the infrastructures that could be most affected by increased flooding risks (river, urban, due to a rise in the sea level or sea storms) or fires.

# ACTION PLAN



6. THE PRINCIPLES  
BEHIND THE ACTION  
PLAN

Page 48

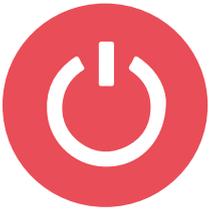


9. TRANSITION TO A  
CARBON-NEUTRAL  
CITY

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13. MONITORING  
Page 179



7. HOW IT HAS  
MOVED ON TO  
ACTION

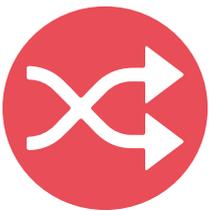
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10. STRATEGIC  
GOALS AND TARGETS  
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14. WOULD YOU  
LIKE MORE  
INFORMATION?  
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8. CHANGES  
OF MODEL AND  
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11. AREAS AND  
LINES OF ACTION  
Page 72



15. INITIALS AND  
SYMBOLS  
Page 181



12. TIMEFRAME  
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# ACTION PLAN

**TIC  
TAC  
CLI  
MA**

## **COMMITMENT**

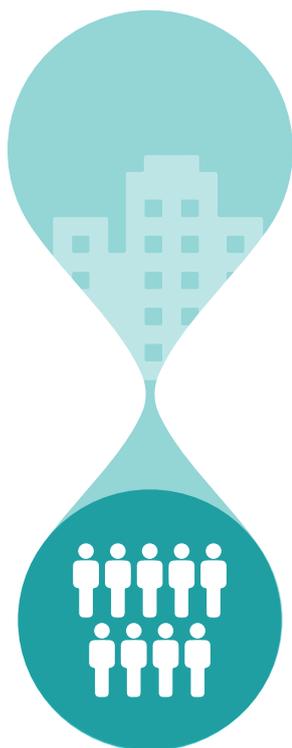
/ RESILIENCE /  
SAVINGS / EFFICIENCY /  
RENEWABLES / REFURBISHMENT  
/ SUSTAINABLE MOBILITY

/ **GOVERNANCE / TRAINING /  
INFORMATION / COMMUNICATION /  
COOPERATION**

/ RESPONSIBLE CONSUMPTION / **CO-  
RESPONSIBILITY / ACCELERATION**  
/ **PROACTIVITY** / GREEN AND BLUE  
INFRASTRUCTURE / **CO-PRODUCTION**  
**LONG TERM / HOLISTIC / MULTILEVEL /  
MULTISCALE** / GREEN AND CIRCULAR  
ECONOMY / PRODUCTIVE ROOFS /  
HEALTH / **CLIMATE SCENARIOS**  
/ **PROJECTIONS**

# 6. THE PRINCIPLES BEHIND THE ACTION PLAN

Barcelona takes responsibility for its contribution to climate change and is preparing itself to be less vulnerable to the effects of that change.



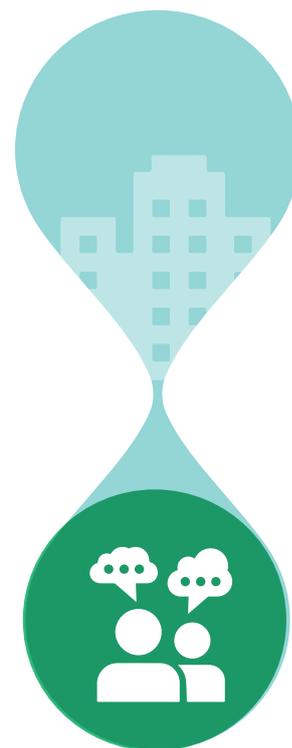
It is focusing on the people, as it directly affects their health and quality of life.



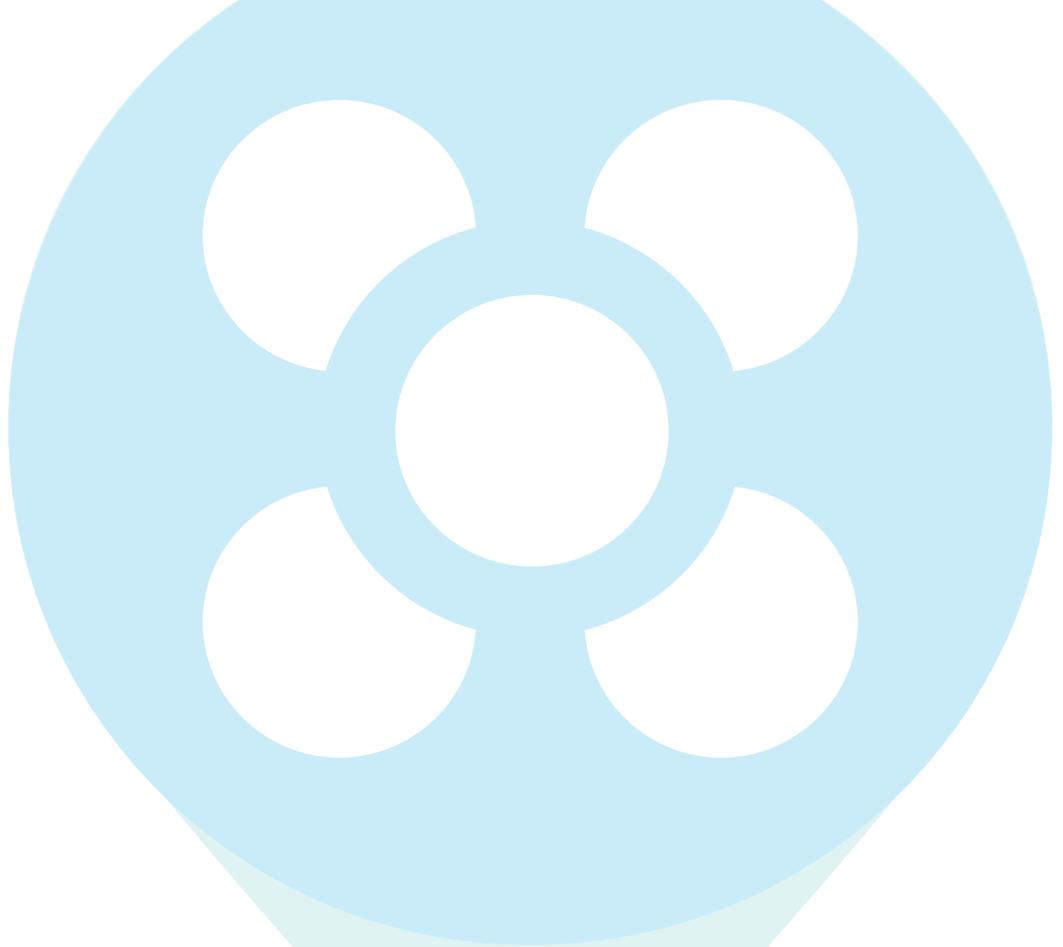
It is comprehensively transforming the city so we can tackle the risks and turn them into opportunities.



It is speeding up efficiency, renovation and the introduction of renewable energies so we are better adapted.



It is dealing with all this through a process of citizen co-production.



## MISSION

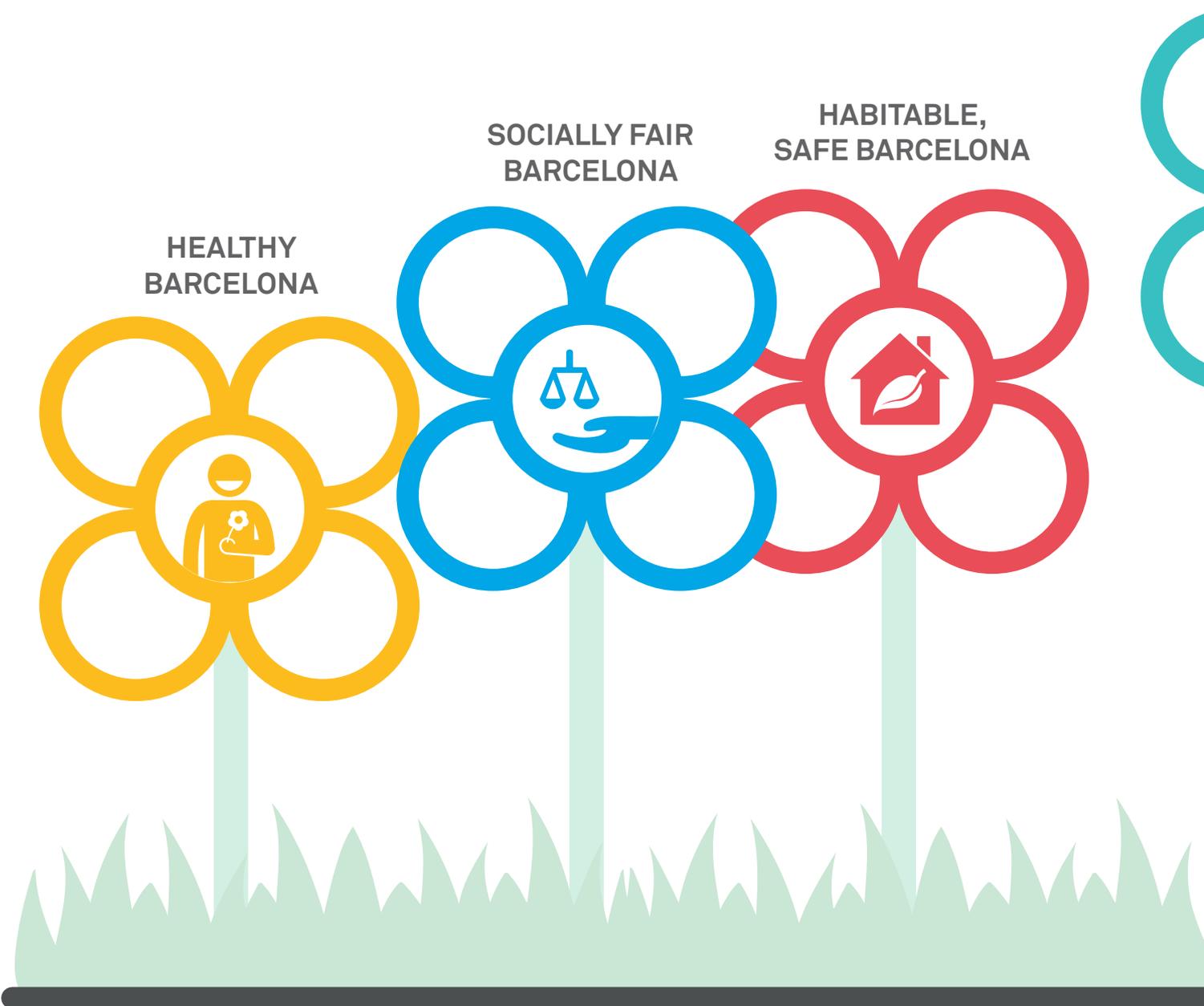
**+ RESPONSIBLE,  
- VULNERABLE,  
+ HEALTH,  
+ QUALITY OF LIFE**

- To reduce Barcelona's contribution to climate change.
- To anticipate climate risks to ensure the city continues to function and improve its response capacity.
- To reduce the vulnerability of people to climate change by guaranteeing their health and well-being.

## VISION

A proactive city that adopts a comprehensive approach to tackling the challenge of climate change and assumes its responsibility in that regard; a city that can find opportunities in difficulties and adapt to new climate conditions intelligently, generating co-benefits for people and socio-economic activity.

# VALUES: THE PILLARS OF A MORE SUSTAINABLE BARCELONA



HEALTHY  
BARCELONA

SOCIALLY FAIR  
BARCELONA

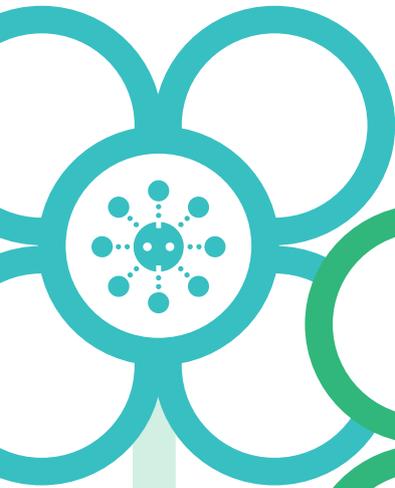
HABITABLE,  
SAFE BARCELONA

**A SOCIALLY FAIR BARCELONA**, that takes the social, economic, gender, territorial and cultural diversity of its citizens into account when applying policies and measures.

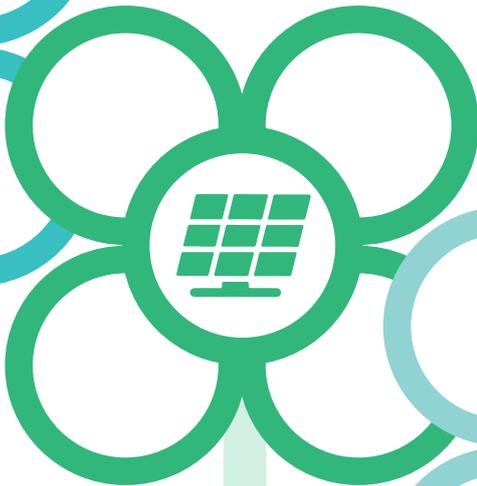
**A SAFE, HABITABLE BARCELONA** that enables people to live in comfort and social cohesion, with quality green areas, and generates safe, friendly spaces that are suitable for everyone.

**A HEALTHY BARCELONA** that promotes active living, where you can breathe clean air and enjoy quality public spaces, and people's health and well-being is guaranteed.

**LOW-CARBON,  
DISTRIBUTIVE  
BARCELONA**



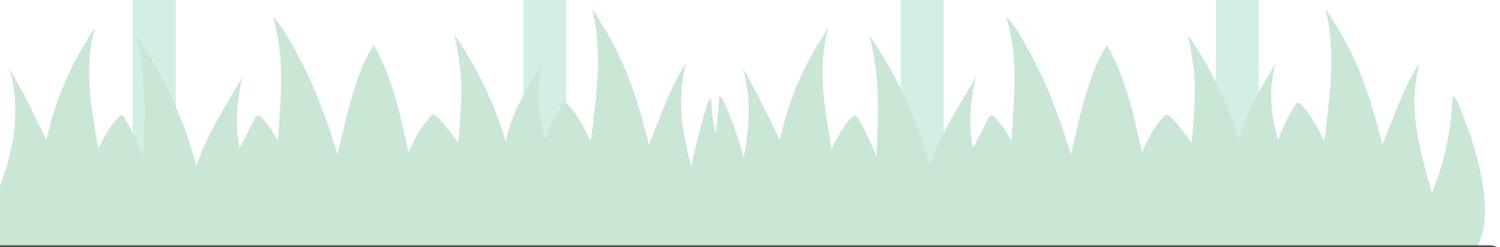
**EFFICIENT,  
RENEWABLE  
BARCELONA**



**BARCELONA  
THAT  
LEARNS**



**COMMITTED  
BARCELONIANS**

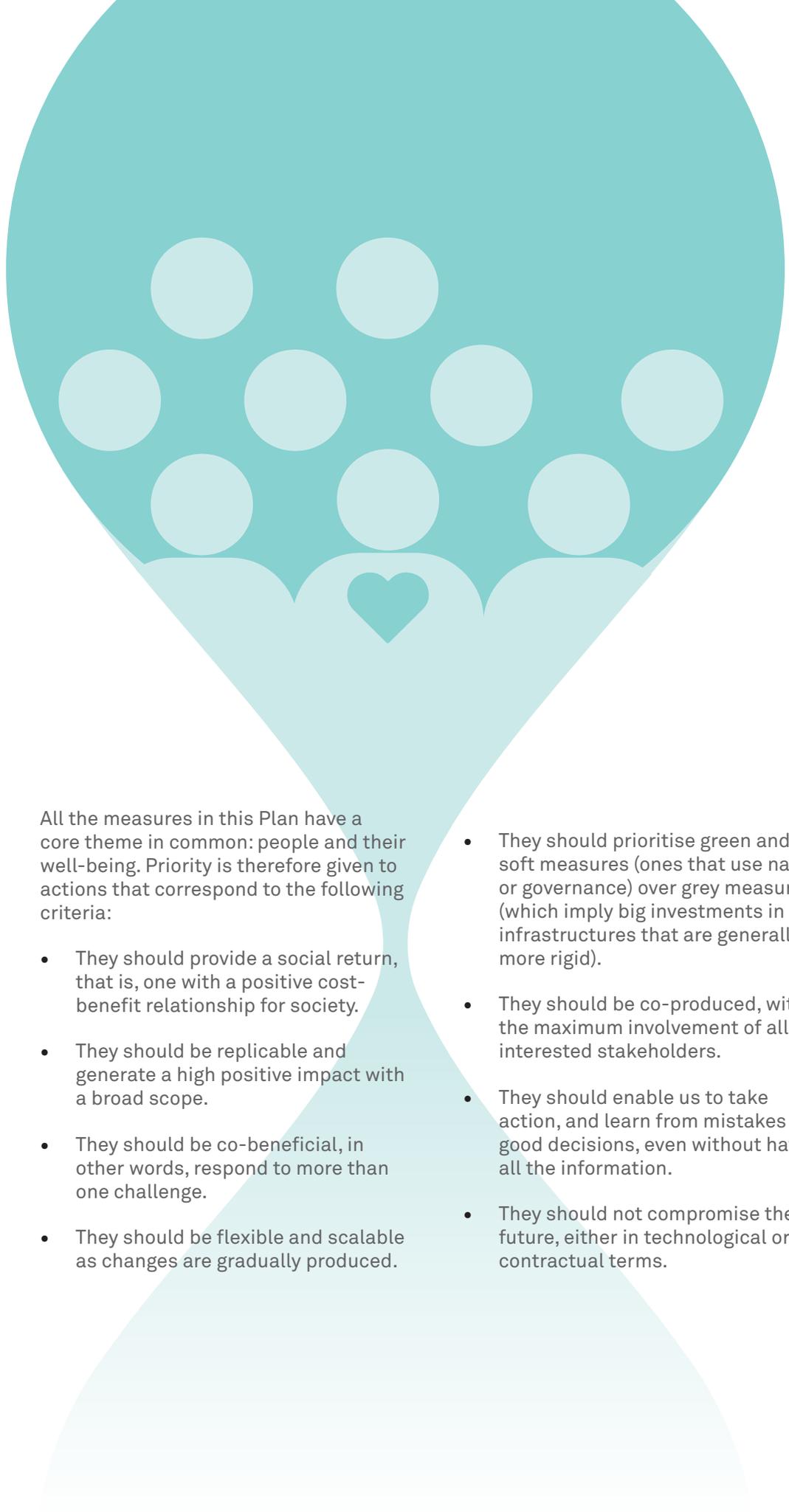


**A LOW-CARBON,  
DISTRIBUTIVE  
BARCELONA** that is not so dependent on fossil fuels for generating energy, nor products and services, and where economic benefits are distributed among its inhabitants.

**AN EFFICIENT,  
RENEWABLE  
BARCELONA** with sustainable mobility, that makes good use of its resources and closes cycles.

**A BARCELONA THAT  
LEARNS**, tries out solutions every day and never forgets, that moves forward and improves every day but is aware it still has a lot to learn.

**AND SOME COMMITTED  
BARCELONIANS, MEN  
AND WOMEN** who know they can change the situation by their actions and protect the future for the generations to come.



All the measures in this Plan have a core theme in common: people and their well-being. Priority is therefore given to actions that correspond to the following criteria:

- They should provide a social return, that is, one with a positive cost-benefit relationship for society.
- They should be replicable and generate a high positive impact with a broad scope.
- They should be co-beneficial, in other words, respond to more than one challenge.
- They should be flexible and scalable as changes are gradually produced.
- They should prioritise green and soft measures (ones that use nature or governance) over grey measures (which imply big investments in infrastructures that are generally more rigid).
- They should be co-produced, with the maximum involvement of all interested stakeholders.
- They should enable us to take action, and learn from mistakes and good decisions, even without having all the information.
- They should not compromise the future, either in technological or contractual terms.

## SCOPE



### TIME SCOPE: LONG TERM

Climate change poses a challenge with a high degree of complexity and requires profound changes in the way of doing things. The climate projections are therefore made with 2100 in mind, while the goals and targets are long-term (2030 and 2050) and the associated actions either short-term (2020) or medium to long-term (2030), depending on their importance and feasibility.



### TERRITORIAL SCOPE: MULTI-SCALE

Climate change does not respect borders. So, to analyse some specific issues (such as the water cycle), wider geographic scales are taken into account (metropolitan, regional, state and international). The Climate Plan envisages a range of measures, ranging from international cooperation to others on a neighbourhood scale.



### COMPETENCE SCOPE MULTI-LEVEL AND HOLISTIC

Barcelona cannot fight climate change on its own. Naturally, it has to use all the powers it can, but it also has to be consistent with the policies and plans of higher authorities, especially in the metropolitan sphere. Therefore, the Climate Plan also has to involve organisations, companies and ordinary citizens in the process and promote co-responsibility. Finally, it has to do that with a holistic, intradisciplinary vision, where measures are projected and put into practice with a mainstream approach, integrating all sectors.

# 7. HOW IT HAS MOVED ON TO ACTION

## A CO-PRODUCED CLIMATE PLAN, FROM CONCEPTION TO IMPLEMENTATION

In 2015 the organisations signed up to the **More Sustainable Barcelona Network** called on Barcelona City Council to come up with a roadmap for tackling the climate crisis. This led to the **Barcelona Commitment to**

Climate and the start of a process that ended up with the drafting of the **Climate Plan**, which was approved in 2018. Social protests have gained momentum throughout the world over the last few months, calling for urgent, decisive action. This call was expressed in Barcelona in the **Climate Emergency Declaration 2020**, which makes the Climate Plan even more ambitious and accelerates its implementation.



Each of the three documents has been promoted through **citizen initiatives** and implemented through **citizen participation and co-production**. Citizen involvement has been both face to face and online, with the online platform **Decidim.Barcelona** put at the public's disposal to enable inclusive and diverse participation. And it has

not been confined to the drafting of documents (co-production of ideas), but has included the implementation of collaborative projects (co-production of actions).

Below, we offer an account of how the participatory process developed over time.

## 7.1 THE BARCELONA CLIMATE COMMITMENT AS A PRECEDENT

### CITIZEN INITIATIVE

A work group was set up in 2015 within the network of signatories to the Citizen Commitment to Sustainability for 2012-2022, with the aim of defining the city roadmap for climate change and collaborative projects for 2015-2017. This process led to the **Barcelona Climate Commitment (CBC)**.

### CITIZEN PARTICIPATION

A total of 141 organisations were actively involved in drafting the CBC. Four participatory sessions were organised which culminated in its signing and presentation to the City Mayor on 23 November 2015.

### CO-PRODUCTION OF ACTIONS

The City Council and Barcelona citizens made a commitment together and to each other, each in their own respective sphere, to pool the initiatives necessary for achieving the CBC's goals. **The Council contributed five strategic measures and seven priority projects, while the citizen network defined nine**

**projects to be rolled out over the course of the two years.**

Specific teams were set up to define the citizen projects, receiving specialist training and advice on how to draw up a project and present it. They had a municipal helper for guidance, someone to ease the administrative tasks and a virtual "Wiki" platform was set up for contributions. The various teams met up at least five times to give shape to their project and **135 people from 86 organisations took part.**

The nine collaborative projects that resulted from this mutual learning process between the City Council and organisations from the More Sustainable Barcelona network can be viewed on the Barcelona for Climate website: [Barcelona Commitment to Climate for 2015-2017](#).

Later on, and in accordance with the Covenant of Mayors for Climate & Energy (2017), the City Council initiated the **drafting of the Climate Plan**, which specified the goals, targets, strategic lines and initiatives that needed to be implemented between 2018 and 2030, with the aim of becoming a totally carbon neutral city by 2050.



## 7.2 THE CLIMATE PLAN

### CO-PRODUCTION OF IDEAS

The general goal of the participatory process during the drafting of the Climate Plan was to offer a space for encouraging citizens to express their opinions and make their contributions, with the following aims:

- **To inform:** To inform organisations and citizens of the Climate Plan and present it to the More Sustainable Barcelona network and public at large.
- **To diagnose:** To compare the diagnosis made by the technical services.
- **To propose:** To gather proposals for inclusion in the Climate Plan.
- **To return:** To explain to citizens how the proposals received had been taken into account.

The process covered the entire city. The Citizen Sustainability Council had been the driving force, aiming to involve all the city's residents through an open process and with a particular focus on members of the More Sustainable Barcelona network. A monitoring committee for the plan was also set up within the Council to ensure the smooth running of the participatory process and compliance with the planning provided for.

Contributions from individuals and organisations were collected from July to December 2017. Four face-to-face sessions were held from July to October and the [Decidim Barcelona online platform](#) was also launched.

- The first session was held at the Espai Jove Fontana on 13 July. The Climate Plan was presented at this session, as was the co-production process that had just got under way, with the tools that were put at the disposal of the organisations, and answers were given to seven key questions on the causes and effects of climate change in Barcelona.

- A participatory dynamic was then established for collecting proposals. [A resources kit for organisations](#) was offered as a tool, giving guidelines and support materials for carrying out processes of internal reflection within the organisations, with the following:
  - Instructions for organising an independent session.
  - Independent session agenda.
  - Video: [Barcelona takes on climate change](#).
  - Video: [What the Climate Plan experts have to say](#).
  - Document with seven questions and seven answers on climate change in Barcelona.
  - Information on the initiatives being implemented at Barcelona City Council to tackle climate change.
  - File with individual proposals.
  - File with proposals from the independent session (group file).
  - Access to the Decidim Barcelona platform.
- A second face-to-face session on action proposals took place on 17 October, with a debate and discussion that enriched the proposed lines of action.
- A session open to the general public was also held on 14 September 2017, at the Urgell Civic Centre, where the Decidim platform gathered 27 proposals.
- The Climate Plan's final presentation and response session was held on 24 April 2018, attended by close to 250 people.

In all, **119 organisational representatives** (92 different individuals) took part and over **100 proposals** were collected, 85% of which were then incorporated into the Climate Plan.

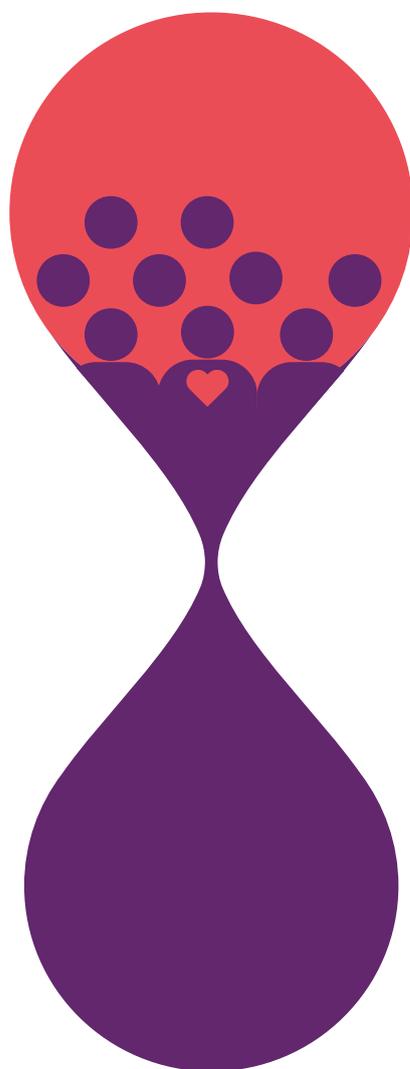
## CO-PRODUCTION OF ACTIONS: NEW LINE OF SUBSIDIES

After the experience with the collaborative projects carried out within the framework of the Barcelona Commitment to Climate, a decision was taken to create a new line of subsidies with the following goals:

- To boost citizen involvement.
- To provide support for collective citizen initiatives.
- To launch and promote innovative initiatives.
- To use co-creation processes.
- To help to achieve the Climate Plan's goals.

This new line of subsidies was created within the general system and on a competitive basis, with a budget of 200,000 euros and an 80% subsidy with a maximum of 20,000 euros. The projects presented were meant to involve at least three organisations, all beneficiary members and with a single spokesperson, a member of the More Sustainable Barcelona network.

**The call in 2018 received 49 proposals from 142 different organisations and 11 were selected, with the participation of 36 different organisations.**



### 7.3 THE EMERGENCY CLIMATE DECLARATION, THE RESULT OF A CO-RESPONSIBILITY PROCESS

#### CO-PRODUCTION OF IDEAS

The Climate Emergency Board was set up in July 2019 as a Citizen Sustainability Council work group, under the City Council's Citizen Participation Regulations, to define specific measures to be implemented for tackling the climate emergency in an effective way.

Four work sessions were held, with fifteen thematic roundtables, between the months of October and December 2019. The first session featured a political and technical presentation of the participatory process and the Climate Plan. Afterwards, attendees were assigned to the various thematic roundtables at each day event, where a municipal expert would explain the main climate challenges and municipal proposals, an official rapporteur would take notes and draw up a report of the session, which was mentioned at the following day event and uploaded to the Decidim platform, and there were two people to facilitate and liven up the discussion.

All together more **than three hundred representatives from some two hundred organisation** took part, 30% of whom were not part of the More Sustainable Barcelona network. In addition, the [Decidim](#) online platform was once again made available, resulting in **130 subscriptions to the proposals** arising from the discussion sessions and some sixty comments. The platform received 4,539 hits, each lasting an average of over 6 minutes.

Based on the challenges set out during the Climate Emergency Board's sessions, seven major changes of model and two adaptations were defined.

Finally, on 15 January 2020, an institutional presentation was made of the Barcelona Climate Emergency Declaration.



**4 work sessions**  
**15 climate boards**

**1st Session, 3 October 2019**

-  Water cycle
-  Much more greenery
-  Renewables
-  Food sovereignty

**2nd Session, 17 October 2019**

-  People first
-  Mobility
-  Zero waste
-  Culture and climate justice

**3rd Session, 7 November 2019**

-  Emissions and health
-  Sustainable urban planning
-  Renovation
-  Circular economy

**4th Session, 28 November 2019**

-  Port and airport
-  Interurban mobility
-  Climate taxation

**7 big changes**  
**2 adaptations**

**Big changes**

-  Change of urban model
-  Change of mobility and infrastructure model
-  Change of energy model
-  Change of economic model
-  Change of consumption and waste model
-  Change of food model
-  Change of cultural and educational model

**Adaptations**

-  Taking care of health, well-being and environmental quality
-  Taking care of water

**CO-PRODUCTION OF ACTIONS**

The second edition of subsidies for climate projects was published at the start of 2020, with the aim of giving support and financial resources to citizen projects that promoted reductions in greenhouse gas emissions, adaptations to climate change and/or climate justice, through energy-saving and energy-efficiency initiatives, initiatives for increasing the use of renewable energies, sustainable-mobility initiatives, initiatives for increasing agricultural and green spaces, waste-prevention initiatives and education and communication

initiatives and so on, and which helped to achieve the climate emergency declaration's goals. The call established the following:

- Collaboration from **at least three organisations** for each project and that the project's lead organisation should be a signatory to the Citizen Commitment to Sustainability.
- Link to the **goals of the Climate Plan** so that they stand out in terms of social innovation.
- Funding for up to **80% of the project**, with a limit of 20,000 euros per project.

## 7.4. CLIMATE EMERGENCY ACTION PLAN'S GOVERNANCE TOOLS

Climate change is a global challenge that requires local initiatives. Moreover, it is a phenomenon that involves many environmental vectors (water, energy, biodiversity, waste, etc.) and has social and economic repercussions. Consequently, it cannot be tackled in isolation by a specific local authority department. It requires a cross-departmental approach that takes the complexity of climate change into account. The whole administration has to be involved in this global challenge.

At a municipal level, **a team has been set up, as has a Technical Policy Board**, to deal with climate change, with all municipal areas represented and the following goals:

- To assess and monitor climate change policies and projects (mitigation and adaptation) in the city.

- To develop and launch project initiatives for mitigation and adaptation to climate change (to promote existing cross-cutting projects in their own sphere and to propose new projects).
- To disseminate and present the projects, both internally and publicly, that are being worked on in this area.
- To increase the level of information available to municipal workers on this issue.

Specific meetings have also been held with municipal technical staff from the areas involved in the Plan, along with various information sessions and an internal participatory session with all the municipal managers to define and reach a consensus on the plan's measures.

In addition, several specific cross-cutting work groups have also been created for a few highly complex leading projects and a few specific sector.



# 8. CHANGES OF MODEL AND NECESSARY ADAPTATIONS

With the aim of stepping up the action and the city's contribution to reducing global emissions, we have made the plan more ambitious, setting the target for a 50% reduction of greenhouse gas emissions by 2030 compared to the values of 1990. That means a reduction of around 1,950,000 tonnes of greenhouse gases. These ambitious targets, which require a great deal of effort on the part of the authorities as well as the city's economic and productive sectors and its citizens, are necessary if we are to be able to tackle the current climate crisis. We are talking about a thorough transition in every

area relating to the city: its production system, residents, how we function, how we move around.

The challenge is huge but doing nothing is a risk we cannot afford. As EU and international commitments are becoming more ambitious, so Barcelona has been committing itself to further intensifying its actions to achieve them. Accordingly, the city is proposing seven major model changes and two adaptations in accordance with the challenges set out at the Climate Emergency Board's participatory sessions.

## CHANGES OF MODEL OR RESILIENT MODELS

### DIAGNOSIS

### THE CITY WE WANT

#### CHANGE OF URBAN MODEL



The metropolitan city of Barcelona is compact, with high residential density, an old housing stock, a shortage of green spaces and a mobility system that is over-dependent on motor vehicles. They are all factors that have a negative effect on its environmental conditions.

By 2050 we want to be a metropolis with balanced neighbourhoods that foster habits of short distances and healthy mobility, with a much more efficient and sustainable building stock. We want a comfortable, traffic-calmed city with lots of green spaces that contribute to people's good health and well-being, and biodiversity.

#### CHANGE OF MOBILITY AND INFRASTRUCTURE MODEL



Mobility is responsible for 40% of greenhouse gas emissions imputed to the city. The current mobility model is still highly dependent on fossil fuels, particularly linked to the use of private motor vehicles but also air and sea transport. They also lead to high, local-level emissions of pollutants that affect the health of residents (NO<sub>x</sub>, and PM).

We want a city with a more sustainable mobility model and a smaller carbon footprint, and we want this change to bring about a transformation of public space that puts people at the centre. A radical change in the mobility model is required on a local and regional scale, and, at the same time, a more rational use of the major infrastructures, such as the port and airport.

### CHANGE OF ENERGY MODEL



Our current energy-consumption and generation model, which is based mainly on fossil fuels, is one of the chief causes of climate change. Reversing this consumption model and moving towards a rational use of energy, based on energy saving and efficiency and the generation of renewable and local energy, where priority is given to self-consumption and self-generation, is essential. At the same time, we need to improve the conditions of our buildings and infrastructures and the use that is made of energy, with greater awareness of the environmental impact of our consumption habits. Our citizens must play a key role in this and take the lead.

We want a city where self-generation and self-consumption are the norm, with a fair, democratic and renewable energy model that will enable us to be renewable and carbon neutral by 2050.

### CHANGE OF ECONOMIC MODEL



The current economic model is based on continuous growth, with an ever-increasing consumption of natural resources. Not only is this economic system putting our planet's ecological balance in danger, it has also significantly increased its inequalities. Without a doubt, the global ecological crisis and the climate crisis in particular are largely due to excessive consumption on the part of the rich countries.

We want a city that facilitates economic and productive activity by fostering a digital and circular economy model, with an economy that is fairer, more social, more environmental and leaves no one behind.

The climate emergency has to spur us on to make changes and achieve a development model that respects the planet's ecological limits and ensures a decent life for everyone. Inaction involves much bigger risks than having the courage to make the changes that would put us on the road to achieving a more sustainable, fairer system.

### CHANGE OF CONSUMPTION AND WASTE MODEL



The pace of resource consumption continues to grow and exceeds the speed with which the planet provides those resources. The current consumption model is inefficient and generates many climatic, environmental and social externalities. A Barcelona resident generates a total of 483 kg of waste a year (1.32 kg/resid./day), whereas selective-waste collecting has remained stagnant for years at around 38%. Plastics, especially those designed for single-use, are a clear example of a linear economy model, as only 10% ends up recycled, not to mention their impact on the environment and on the well-being of the population and the rest of the planet's natural world. So we have to accept the EU targets for selective collection and recycling.

We want a city with a critical and responsible attitude towards consumption and which is shifting to a social and solidarity economy with a circular model, where there is no place for waste.

### CHANGE OF FOOD MODEL



Food production accounts for between a quarter and a third of greenhouse gas emissions. But Barcelona is not only a producer, it is also a consumer. We consume 650 kg of food per inhabitant a year, yet only 10% to 15% is produced locally. On the other hand, experts agree that a healthy diet (500 g of fruit and greens, 500 g of greens and other vegetables per day) plays a vital role in reducing obesity rates and risks of serious illnesses in adulthood. Yet 10% of children aged 3 to 4 in Barcelona are obese.

We want to move towards a city that is well integrated in the region and which promotes the agro-ecological value of its setting, that is less externally dependent for its food supply and has a populace that is aware of the importance of its food model.

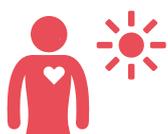
### CHANGE OF CULTURAL AND EDUCATIONAL MODEL



Culture is a key element for tackling the climate crisis, as the cultural context is the reference framework which shapes the way people live and act. Education, cultural activity, communication and encouraging citizens to take action are vital instruments for advancing down this road. The More Sustainable Barcelona network is a key piece in this cultural transformation. We need to strengthen programmes, promote climate action in neighbourhoods, include awareness-raising of the climate emergency in education and the city's cultural programmes and convey clear messages.

We want a city where people, organisations, institutions and businesses each assume their own responsibility and, together, the city's responsibility for minimising its impact and reversing its ecological debt. A city that learns, with committed Barcelona citizens who know they can change the situation by their actions and protect the future for the generations to come.

### TAKING CARE OF HEALTH, WELL-BEING AND ENVIRONMENTAL QUALITY



Climate change affects health and quality of life but does not affect us all in the same way. Factors such as physical condition, health, age, gender, socio-economic situation or the environmental conditions where we live and work determine the possible degree to which climate change affects people. In fact, it is believed that the climate crisis is the biggest threat to health this century. Excessive and sustained heat leads to an increase in mortality and morbidity, especially among the most vulnerable groups of human beings, as well among the rest of the natural world. Between 1992 and 2015, it is estimated there were 980 deaths among men and 2,729 among women (natural deaths of people aged 25 and over) that were attributable to extreme heat, generally fragile older people.

We need to advance towards becoming a healthy city that ensures the health and well-being of its citizens. A socially just city that reduces inequalities. And a habitable, comfortable city with quality public spaces.

TAKING CARE OF  
WATER



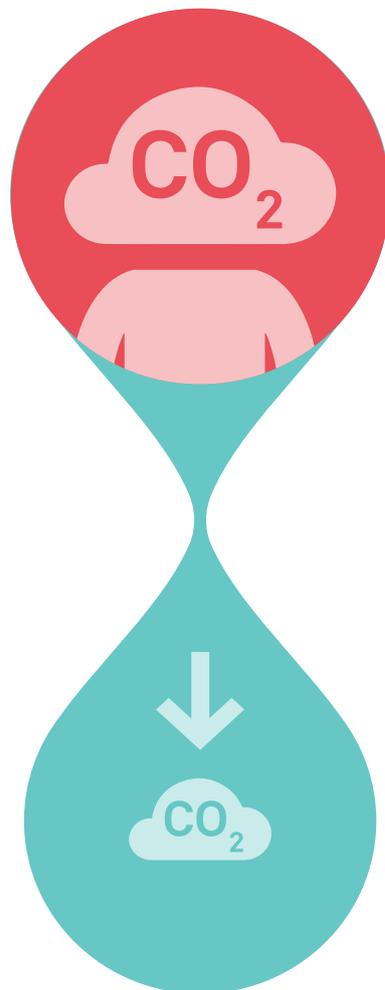
The climate crisis will only worsen the shortage of water resources typical of Mediterranean areas. It is forecast that there will be a need for an additional 18 hm<sup>3</sup> a year of potable water resources by 2050.

An increase in heavy rainfall is expected. Because of the city's high level of impermeability, there will be more cases of the sewers overflowing, as well as untreated water occasionally flowing into the sea. The rise in the sea level, what is more, may lead to a reduction in or loss of part of Barcelona's beaches. In fact, studies show a big part of Sant Sebastià beach will be lost at the end of the century.

We want a more resilient city that is capable of adapting and being proactive in the face of a lack of resources, with a more efficient consumption that promotes alternative resources and protects the coastline and rivers in its sphere.

# 9. TRANSITION TO A CARBON-NEUTRAL CITY

Two scenarios have been defined to analyse the future development of energy consumption and emissions in Barcelona up to 2030:



## TREND SCENARIO

This considers how energy consumption and related greenhouse gas emissions will evolve, taking into account the predicted behaviour of different context factors (population, GDP, mobility, city vehicle fleet and its renewal, etc.) as well as the anticipated electric mix, with a calculation based on the approach of the Catalan Climate Change Act. Among other things, this foresees:

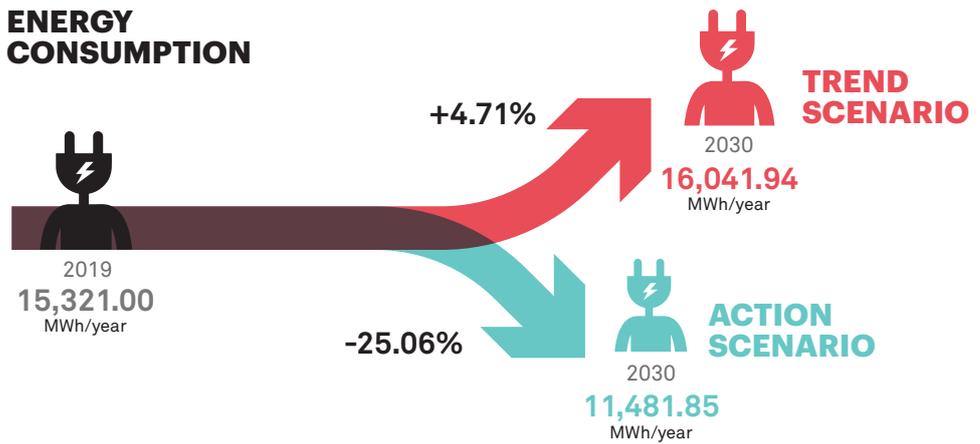
- Reducing final energy consumption by 2% a year and at least 27% by 2030.
- Reaching 50% renewable energies in the Catalan electricity grid by 2030, and 100% in 2050, with zero fossil-fuel consumption.
- Adopting a plan to close the three nuclear power stations no later than 2027 (Ascó I and II in 2024 and Vandellòs in 2027).

## ACTION SCENARIO

Considers the application of the Climate Plan measures and their effect on reducing energy consumption and emissions compared to the trend scenario. Achieving the action scenario will initiate the path to neutrality in 2050 and necessarily involve a revision of the estimated forecast for the increase in energy consumption and associated emissions.

**ENERGY CONSUMPTION NEEDS TO BE REDUCED MORE, EVEN THOUGH IT HAS STABILISED**

**ENERGY CONSUMPTION**



The Climate Plan goes further than the Covenant of Mayors for Climate and Energy. It is more ambitious and targets a 50% reduction in emissions by 2030. By applying the measures envisaged in the Climate Plan up to 2030, Barcelona will be closer to the carbon neutrality target by 2050.

The intermediate target of 2030 will enable us to break the present consumption and emission dynamic and reach 2050 with neutral levels.

If the Climate Plan is not implemented, the trend scenario would, in 2050, put us in the situation we foresee being in by rolling it out in 2030. In other words, we advance 20 years. Also, not implementing the Plan would mean the efforts required would be greater, more costly and less fair.

**TREND SCENARIO (2019-2030)**

It estimates an annual increase of energy consumption of 0.43%. As a result, the expectation is an increase of 4.71%, rising from 14,995.30 MWh a year in 2019 to 15,321.00 MWh a year in 2030. That increase is due to an estimated increase in the population and the following estimations:

- **By energy source:** there will be a slight increase in the consumption of natural gas (12.24%) and electricity (13.15%). But there will be an overall fall of 9.67% in automotive fossil fuels and of 59.55% in liquefied petroleum gases.
- **By sector**
  - **Commercial:** it is estimated that this will be the sector that increases its consumption the most, mainly electricity, due to higher demand for air conditioning.
  - **Domestic:** consumption is expected to stabilise after the fall of recent years, despite a rise in electricity consumption due to the proliferation of electronic appliances and more demand for air conditioning.
  - **Industrial:** it is forecast consumption will rise due to higher consumption of natural gas with the economic recovery, although the application of efficiency measures will reduce electricity consumption.

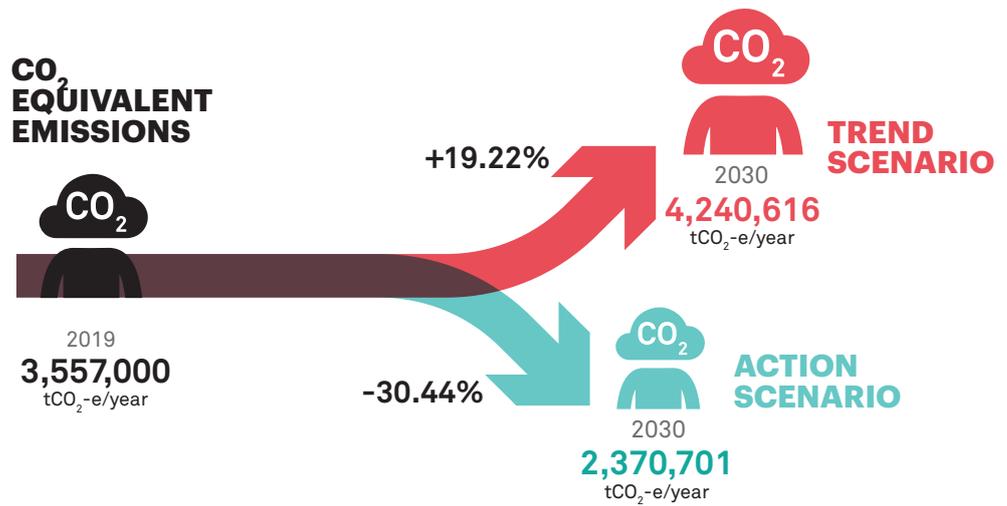
**ACTION SCENARIO FOR 2019-2030**

By applying the Climate Plan measures it is hoped that the total energy consumption per resident will be reduced by 25.06%, which is equivalent to an annual fall in energy consumption of 2.28%.

- **By energy source,** an overall reduction is expected in natural gas consumption (10.90%) and electricity consumption (12.8%). The expected percentages of consumption, are 60.26% for automotive fossil fuels and 59.55% for liquefied petroleum gases.
- **By sector,** it will be the transport sector that cuts back consumption the most (57.19%), followed by the commercial sector (22.80%), and the domestic sector (5.46%). The industrial sector has experienced a slight increase (2.96%) and other sectors have seen a rise (24.34%), but all this represents under 1% of the city's total final energy.

We are starting to see the **uncoupling of energy consumption from GDP growth**. In other words, energy intensity is improving. In general, that means economic activity has less environmental impact, a dynamic that should improve in the coming decades as a result of Barcelona becoming carbon neutral in 2050.

**IF WE ACT NOW, WE WILL BE ABLE TO REDUCE EMISSIONS MORE EASILY AND MORE QUICKLY**



### TREND SCENARIO FOR 2019-2030

With the closing-down of nuclear power plants and intensive increase in renewables provided for in the Catalan Climate Change Act, the resulting emission factor from the electric mix will increase, leading to a 19.22% growth in greenhouse gas emissions, reaching 4,240,616 tonnes of CO<sub>2</sub>-e in 2030.

- **By source**, lemissions from natural -gas consumption will increase by 10.82% and those from electricity by 87.88%, while those from the consumption of automotive fossil fuels and LPG will fall by 15.57% and 58.04% respectively.
- **By sector**:
  - **Transport**: emissions will be reduced thanks to the renewal of the vehicle fleet (with 15% e-vehicles forecast on Barcelona’s roads). Natural gas-powered vehicles will come to the fore because they are best ones for reducing NO<sub>x</sub> and PM<sub>10</sub> emissions, with less impact on air quality than diesel or petrol-powered vehicles.
  - **Waste treatment**: emissions will stay at the same level.

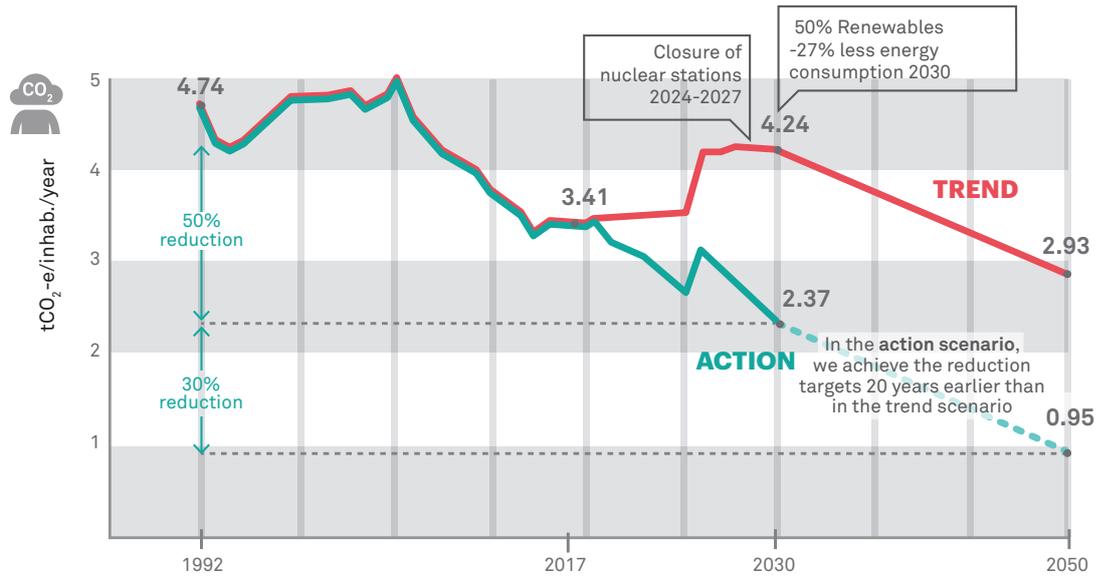
### ACTION SCENARIO FOR 2019-2030

The initiatives included in the Climate Plan and Climate Emergency Declaration are expected to reduce the total emissions for 2019 by 1,186,299 t CO<sub>2</sub>-e , which represents a per capita reduction of 33.35% compared to the 2019 levels (and of 50% compared to 1992).

- **By source**, there will be a very significant reduction in emissions from LPG and fossil fuels (58.04% and 70.69% respectively) given the expected corresponding drop in consumption. On the other hand, the emissions associated with electricity consumption will increase by 47.57%. GHG emissions from solid urban waste treatment are expected to fall by 48.58%.
- **By sector**: only transport and municipal waste treatment will reduce their emissions in the same period, although the reduction will be significant.

## ACTION AND TREND SCENARIO

Source: Barcelona Energy Agency.



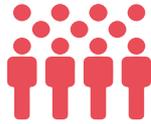
## PROGRESS COMPARED TO BASELINE AND ACTION SCENARIOS WITH DATA FROM 2019.

Source: Original.

	2019	% compared to baseline scenario	% compared to action scenario
 <b>Total energy consumption</b>	<b>15,321 GWh/year</b>	We are currently 721,94 GWh/year below the forecast.	Required reduction of 3,838,15 GWh/year (compliance in 33.41 %),
 <b>Total emissions</b>	<b>3,557,000 tCO<sub>2</sub>-e//year</b>	We are currently 683,616 tCO <sub>2</sub> -e/year below the forecast.	Required reduction of 1,186,299 tCO <sub>2</sub> -e/year (compliance in 50.04%),

## PROJECTIONS FOR CONTEXT INDICATORS

The following variables were taken into account in calculating energy consumption in the scenarios posed:



- **POPULATION:** the estimated annual population increase between 2016 and 2030 is 0.3%, which means a rise from 1,608,746 to 1,677,047 inhabitants.



- **GROSS DOMESTIC PRODUCT (GDP):** the GDP percentage variations considered from 2018 on reflect the standard trends in economic growth and are not particular to Barcelona. The analysis assumes a moderate a year-on-year growth in GDP between 1.5 and 2%.



- **MOBILITY:** it is estimated there will be a very slight increase in mobility from 2014 to 2030, with an inter-annual rate of 0.4%. With this scenario, in 2030 we would reach 4,500 Mveh/km/year (at the start of the 2000s it was around 5,000 Mveh/km/year).

As regards the energy source, it is estimated that a smaller proportion of vehicles will use diesel compared to petrol in 2030, with a maximum increase in electric vehicles of up to 15% of all vehicles on the road. The Catalan Climate Change Act forecasts e-vehicle registrations will reach 30% in 2025.

- **BUILT SURFACE:** an increase of 1,192,617m<sup>2</sup> is forecast in the residential sector up to 2025, and 2,013,278 m<sup>2</sup> by 2030 compared to the 2014 levels. This is equivalent to a year-on-year rate of 0.2% between 2014 and 2030, in line with the rate of population growth. The estimated increase in the tertiary and industrial sectors is 2,308,482 m<sup>2</sup>, with an inter-annual rate of 0.5% between 2014 and 2030.



- **CONSUMPTION INTENSITY:** with regard to the unit energy consumption of households (per unit of surface area or per unit of GDP), it is estimated there will be a slight fall in the consumption of natural gas, due to greater efficiency and the effects of climate change, but an increase in electricity consumption due to the initial effects of climate change (increase in the number of air-conditioning appliances and a more intense use of existing ones) as well as housing having a greater degree of electrification.

The trends considered for the commercial and service sectors are different to those of the residential sector. The effects of climate change on the consumption of natural gas are not as significant, while electricity consumption is affected by efficiency improvements as well. In spite of that, lower energy intensity would not be able to keep energy consumption stable, with this rising as a result of the expected increase in commercial GDP from the further outsourcing of the economy which is forecast.

# 10. STRATEGIC GOALS AND TARGETS

## NEW, MORE AMBITIOUS GOALS AND TARGETS FOR REDUCING GHG EMISSIONS IN BARCELONA, TO HONOUR THE COMMITMENTS UNDERTAKEN

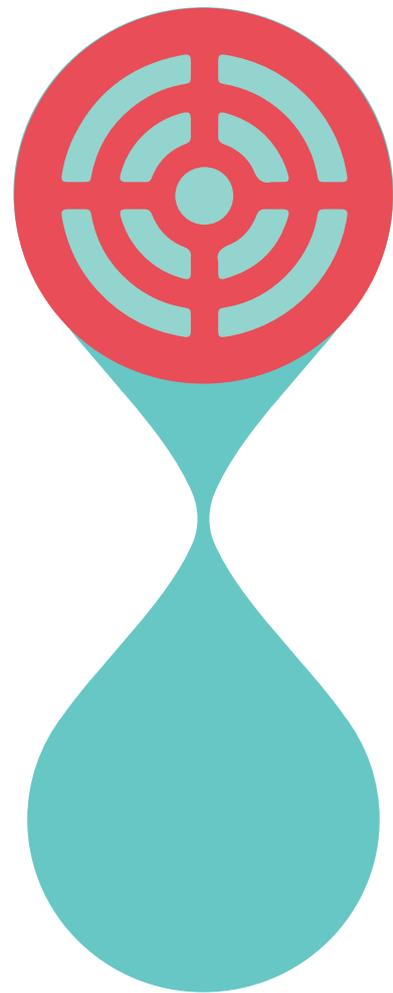
The new **Catalan Climate Change Act** envisages a transition to an emission-neutral economy with a reduction in greenhouse gases (GHGs) of 40% by 2030, 65% by 2040 and 100% by 2050 compared to the base year of 1990. The Act does not specify the contribution of cities to that target but, to achieve it, Barcelona would have to reduce its GHG emissions per capita by more than 50% compared to 2005 (the benchmark year for the Climate Plan) by 2030.

With regard to the commitments acquired from the **Covenant of Mayors for the Climate and Energy** and the **Barcelona's Commitment to the Climate**, Barcelona would have to reduce GHG emissions per capita by 40% by 2030, compared to 2005.

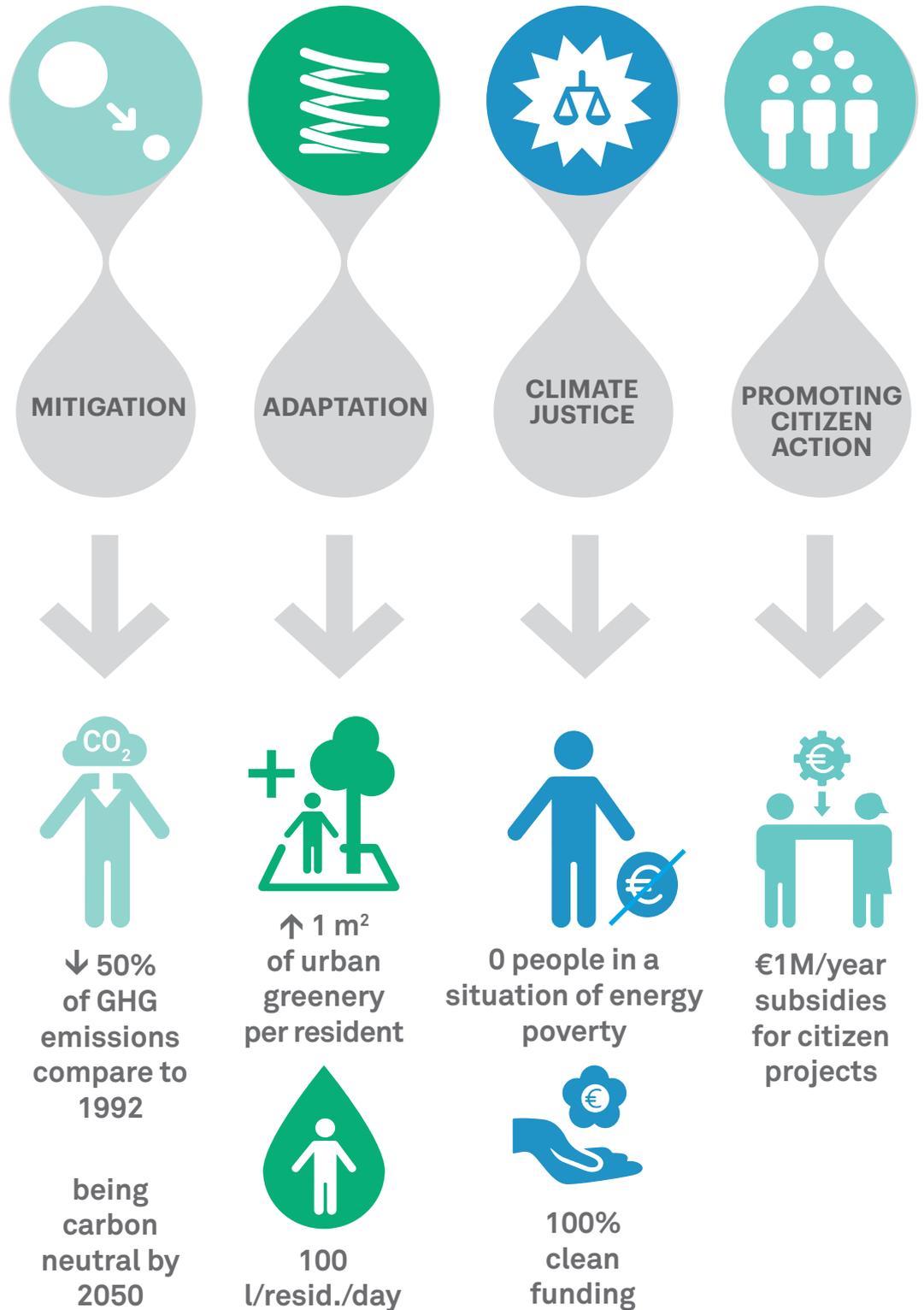
Finally, Barcelona is also committed to becoming a carbon-neutral city by 2050, together with the other cities that belong to the C40 network.

For all those reasons, the Climate Plan increases the final targets for reducing GHG emissions, compared to the Barcelona's Commitment to the Climate. So it goes further than Barcelona's commitments on a local level (>40%) and aligns itself with the regional target for 2030 set in the Catalan Act (>50%) and carbon neutrality by 2050.

On the other hand, the City of Barcelona commits to update its emissions reduction trajectory, to maintain an up-to-date estimate of residual emissions, and to explore different opportunities to reduce residual emissions on a regular basis.



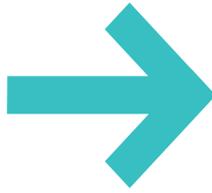
## STRATEGIC GOALS FOR 2030



# 11. AREAS AND LINES OF ACTION

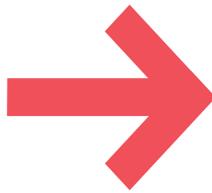
## HEALTH AND WELL-BEING

People first



## ENERGY SAVING AND GENERATION

Improving efficiency in buildings



## URBAN AND MOBILITY MODEL

Transforming public space into a healthy, biodiverse, efficient and inclusive environment



Uncoupling economic growth from the quality of people's lives, with a circular vision that makes the most of resources and avoids generating waste and emissions

## ECONOMY AND CONSUMPTION



and involvement from citizens who are informed, critical, proactive, organised and empowered

## CLIMATE CULTURE



The Climate Emergency Action Plan is divided up into **five areas** of action and **eighteen lines of action**. The areas of action correspond to the major issues that the plan is intended to address directly and cross-cuttingly. This Action Plan is the result of combining the Climate Plan, which was approved in 2018, and the Climate Emergency Declaration of 15 January 2020. This combination has incorporated the city's transformational vision of the Declaration, with seven changes of model and two adaptations, in the initiatives already set out under the Climate Plan in several areas and vectors: water, energy, urban greenery, urban planning, consumption etc.



The initiatives described here are, then, the result of this combination. Some have been kept in their original drafting, some slightly amended, some re-written or combined and others eliminated to avoid duplication. Priorities resulting from lessons learned from the COVID-19 health crisis have also been incorporated.

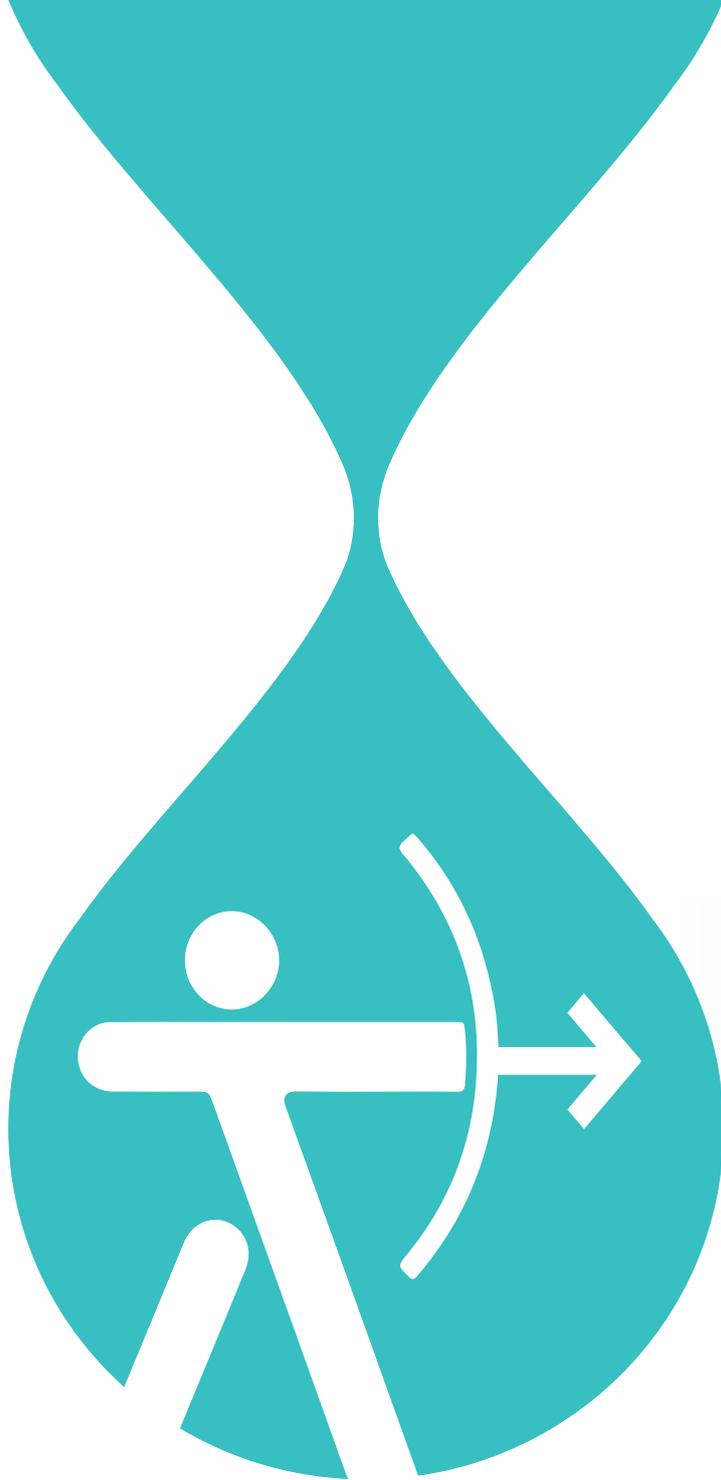
Each of these areas has a number of quantitative targets that will enable us to assess the action plan's progress.

Each of these lines of action presents:

- The goals.
- Their justification and expected benefits.
- Initiatives already provided for in existing plans.
- Priority initiatives in the post-COVID-19 scenario.
- Initiatives that need launching. Each initiative states the main players involved and the expected date for its implementation.
  - Short-term (2018-2025).
  - Medium-and long-term (2026-2030).
- One initiative by way of example.
- The strategic areas of the plan it has an impact on.
- The values covered by the plan.
- Monitoring indicators.
- Associated lines of action.

Overall, the Climate Emergency Action Plan considers 234 measures.

Whether they are implemented correctly will depend on coordination between the City Council's various areas and their capacity to get city residents and other players involved.



# HEALTH AND WELL-BEING

Climate change affects health and quality of life but it does not affect everyone in the same way. Which is why the Climate Emergency Action Plan cannot respond to the effects of climate change on the city and its citizens in a uniform way. The measures launched must prioritise the groups that are most vulnerable to climate change, such as the elderly, newborns, women (at risk of higher heat-related mortality than men), people with certain prior illnesses, people with socio-economic difficulties etc.

Guaranteeing the supply of water and energy and the functioning of critical services and infrastructures, preventing utility-supply cuts to people in vulnerable situations, improving the thermal comfort of dwellings and strengthening social cohesion are a few of the examples of how the Climate Emergency Action Plan proposes to deal with climate change, by putting people above everything else and ensuring their health and well-being.



## GOALS AND TARGETS FOR 2030:

- ✓ 0 people in a situation of energy poverty.
- ✓ 100% of the population at least 5 minutes on foot from a climate shelter (facilities and urban parks that provide good thermal comfort conditions and which could shelter sensitive people in the event of heat waves).
- ✓ 10,000 renovated dwellings per year.
- ✓ To improve thermal comfort at 40 state-run schools, 4 municipal care homes for the elderly and 2 early intervention centres for children with disabilities.
- ✓ 1 water garden per district.

# TAKING CARE OF EVERYONE

Providing special assistance to those most vulnerable to the climate crisis owing to their socio-economic situation, age, gender, condition or state of health.



## JUSTIFICATION AND BENEFITS

Climate change affects people in different ways, depending on various factors: their physical condition, health, age, gender and socio-economic situation, the roles and activities they perform, the characteristics of the physical environment they live and work in, and so on. It is estimated, for example, that between 1992 and 2015 there were 980 deaths among men and 2,729 deaths among women (natural deaths of people aged 25 and over), generally fragile older people, that were attributable to extreme heat. Age affects women here more than it does men, so climate policies must take account of this twofold factor when it comes to implementing inclusive and effective measures.

We need to further analyse how climate change specifically affects each group in order to identify possible risks and vulnerabilities, and define specific actions for responding to them. It would be advisable

for us to strengthen our existing plans, such as the Neighbourhood Plan or Right to Gender Justice Plan, and work on improving the thermal comfort of dwellings and facilities with specific energy renovation programmes.

Care services for the most vulnerable people, particularly health and mobility services, should be strengthened and alternatives to activities that are harder for them in severe weather events should be created.

On the other hand, care for vulnerable people and the promotion of new productive and commercial community or proximity activities can become opportunities for employment (urban green, agriculture and food sovereignty, repair of products and revaluation of residus, local manufacturing, energy rehabilitation and installation and maintenance renewable energy, or cures).

## ACTIONS OF THE PLAN

### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Barcelona Urban Mobility Plan (2013-2018).
- Bicycle Strategy (2015).
- Barcelona Neighbourhood Plan (2021-2024).
- Plan for Gender justice (2016-2020).
- Barcelona Strategy against the Feminisation of Poverty and Job Insecurity (2016-2024).
- Right to Housing Plan (2016-2025).
- Creation of energy advice points and guaranteeing basic utility supplies (2016).
- Action Plan to Prevent the Effects of Heat Waves on Human Health (annual).
- Democratising Care (2017-2020).

## ILLUSTRATIVE ACTION



### Home interior alterations programme for people in vulnerable situations

Barcelona City Council is promoting housing renovation to ensure everyone has a decent place to

live in. The new line of grants prioritises energy-saving measures and flat interior improvements.

Renovation grants serve to improve the accessibility and habitability of homes. Improvements are expected to include actions aimed at improving the thermal and acoustic insulation of flats, and making sure they have suitable installations, free of polluting materials.

The purpose of the programme is to ensure minimum habitability, safety, security, accessibility, hygiene and energy-efficiency conditions by carrying out basic alterations on housing where people in vulnerable situations have established their usual and permanent place of residence.

The programme covers 100% of renovation expenses, which have to be approved by the Housing Consortium and have an upper limit of €20,000 per dwelling, including VAT. The owner undertakes to refund the full amount if they transfer ownership of the dwelling and, if it is rented out, to maintain the same contractual conditions for at least two years following completion of the work.

## PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

ACTIONS	DATE	OFFICERS
<b>1.1. To improve the social networks of elderly people who live alone and strengthen existing projects (Vincles, Radars, etc.) and specific actions such as promoting the Tele-assistance Services.</b>	2020	Barcelona City Council
<b>1.2. To set in motion the necessary mechanisms for increasing the impact of public subsidies with an energy, environmental and social-justice based approach,</b> as part of public policy for encouraging renovations, so we can achieve a figure of 10,000 dwellings a year with financial aid (subsidies or loans) for energy renovation, putting special attention on the most vulnerable households and promoting passive and traditional solutions.	2025	Barcelona City Council Banks and property owners
<b>1.3. To create at least ten comprehensive-care superblocks,</b> geared to providing a comprehensive care service for dependent persons, with local domestic-care service teams.	2025	Barcelona City Council
<b>1.4. To make progress in guaranteeing the right to food in an inclusive and dignified manner,</b> taking advantage of the current system's potential and resolving any shortages identified (Alimenta Project).	2025	Barcelona City Council
<b>1.5. To promote green jobs, self-employment and eco-entrepreneurship in economic sectors associated with climate change</b> (such as energy renovation, solar panel installation and maintenance, sustainable foods and electric mobility, among other things). To give the Labora project an environmental vision.	2025	Barcelona City Council

## SHORT-TERM ACTIONS (2018-2025):

ACTIONS	DATE	PLAYERS INVOLVED
1.6. <b>To reduce the nuisance caused by bad smells</b> by improving waste collection and sewage systems in the event of hot weather.	Ongoing	Barcelona City Council
1.7. <b>To create support figures that can enable and advise on the renovation initiatives that have to be carried out, depending on the type of initiative and features of the building where it is carried out (local renovators).</b>	2020	Barcelona City Council
1.8. <b>To specifically train Home Assistance Service (SAD) workers</b> to identify situations of energy poverty and vulnerability to heat/cold, as well as to propose initiatives for improving thermal comfort in the home.	2020	Barcelona City Council

## MEDIUM- AND LONG-TERM ACTIONS (2026-2030):

ACTIONS	DATE	PLAYERS INVOLVED
1.9. <b>To generate knowledge on the distinct effects of the climate crisis on women and Barcelona's most vulnerable groups</b> , such as those on low incomes, migrants and refugees.	2030	Barcelona City Council

### MUNICIPAL PLAYERS INVOLVED

- Social Rights, Global Justice, Feminism and LGBTI Affairs.
- Urban Ecology.
- Districts.
- Barcelona Public Health Agency.
- Barcelona Health Consortium.
- Barcelona Education Consortium.

### MONITORING INDICATORS

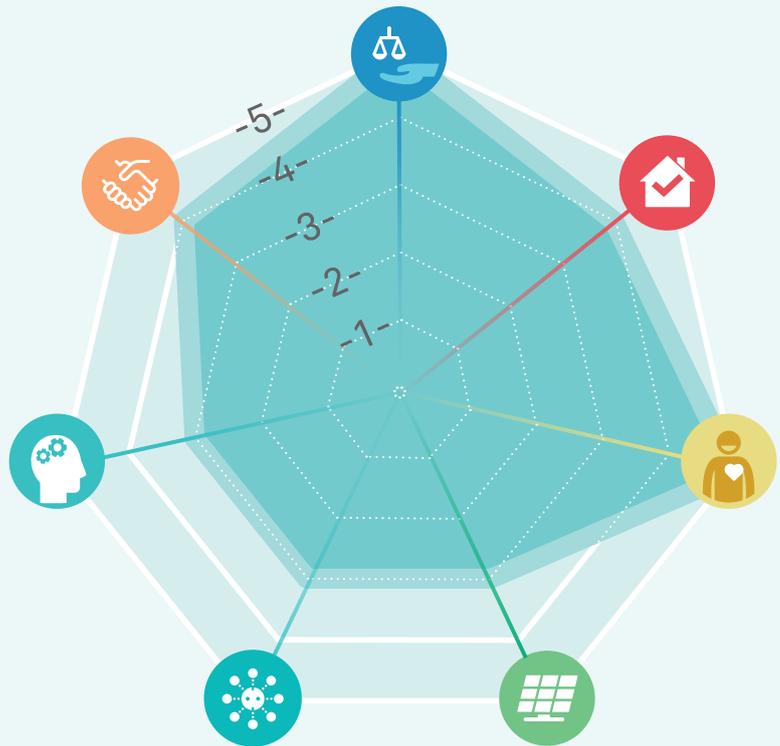
- Number of renovated dwellings incorporating energy efficiency criteria.
- Number of people benefiting from grants and subsidies.
- Number of neighbourhood villages established.
- Number of building renovations carried out.
- Number of grant requests processed.
- Number of journeys made in specific transport services for vulnerable people.

### STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN



## VALUES OF THE CLIMATE EMERGENCY ACTION PLAN

-  SOCIALLY FAIR BARCELONA
-  HABITABLE, SAFE BARCELONA
-  HEALTHY BARCELONA
-  EFFICIENT, RENEWABLE BARCELONA
-  LOW-CARBON, DISTRIBUTIVE BARCELONA
-  BARCELONA THAT LEARNS
-  COMMITTED BARCELONIANS



Taking care of everyone

### ASSOCIATED LINES OF ACTION:



No cuts



To guarantee thermal comfort



Better than new buildings



Reclaiming roof terraces



Climate-based urban transformation



Many more green areas



Not a single drop wasted



Renewables in public areas



Good mobility



Protecting the coastline and our rivers



Green and circular economy



Responsible consumption



Zero waste



Food sovereignty



Cultural action for the climate

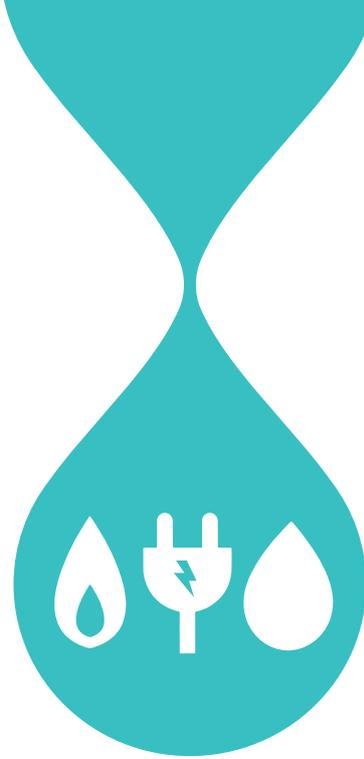


Climate cooperation



Let's get organised

To guarantee access and ensure there are no cuts in basic supplies of electricity, gas and water, especially to the most vulnerable.



## JUSTIFICATION AND BENEFITS

Climate change could have consequences for the population's access to basic utilities (water and energy), given the increased possibility of critical parts of the supply systems being exposed to natural hazards and its impact on the availability of water resources or the need to switch to renewable energy resources, as well as the possible changes in consumption patterns or increased demand it might give rise to. Effort needs to be put into ensuring the continuity of these services and universal access to basic water and energy supplies, despite the negative impact of these factors.

In the case of people at risk of social exclusion, Act 24/2015 bans utility companies from cutting off supplies where the failure to pay utility bills results from a lack of financial resources. They are now legally obliged to maintain their gas, water and electricity supplies to customers for as long as they remain in a vulnerable situation or financial difficulty.

And to guarantee the public's rights in relation to utility companies, Barcelona City Council has set up

some energy advice points (PAEs) in each district that offer help and information and intervene to prevent supplies being cut off, as well as ensure the utility companies do not deny anyone access to any utility. They also offer the general public information on reducing bills, improving energy efficiency in the home and the grants available for that, and installing solar energy systems in buildings.

They also offer the general public information on reducing bills, improving energy efficiency in the home and the grants available for this purpose, and installing solar energy systems in buildings. Women, because of structural gender inequalities, have greater difficulty finding decent housing and meeting the costs of basic utilities. Close to 70% of the people attended to at PAEs are women.

Barcelona City Council seeks to guarantee basic gas, water and electricity supplies for everyone.

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## ACTIONS OF THE PLAN

### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Creation of energy advice points and guaranteeing basic utility supplies (2016).
- Transition towards energy sovereignty (2016).
- Gender Justice Plan (2016-2020).
- Barcelona Strategy against the Feminisation of Poverty and Job Insecurity (2016-2024).

## ILLUSTRATIVE ACTION

PERQUÈ NO ET TALLIN



LA LLUM, L'AIGUA O EL GAS

POSEM TOTA  
L'ENERGIA

### Barcelona City Council's energy advice points

Energy advice points are a Barcelona City Council service that offer people the help, information and intervention they need to exercise their energy rights and prevent companies from denying them access to basic utilities.

In addition they advise the general public on processing social bonds, grants for improving energy efficiency in the home and cutting utility bills.

## PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

ACTIONS	DATE	PLAYERS INVOLVED
2.1. To promote and prioritise self-production of energy from renewable sources and to make it accessible also to vulnerable households.	2025	Barcelona City Council Spain
2.2. To guarantee water and energy supplies and continuity of services from critical facilities and infrastructures (health centres, social services centres, schools, residences and so on) during emergency situations (extreme heat, flooding, power cuts, water shortages, etc.)	2025	Barcelona City Council

## SHORT-TERM ACTIONS (2018-2025)

ACTIONS	DATE	PLAYERS INVOLVED
2.3. To deploy a municipal energy operator that will drive renewable-energy production in the municipality and facilitate its implementation in public and private spaces.	Ongoing	Barcelona City Council
2.4. To create a municipal energy supplier at the service of all citizens.	2018	Barcelona City Council
2.5. To revise the domestic sewage tax so it includes discounts for sensitive groups.	2020	Barcelona City Council
2.6. To make the current energy advice points climate advice points (on green roofs, low-carbon food, etc.) and to continue to guarantee basic services for people in a vulnerable situation.	2020	Barcelona City Council
2.7. To improve our knowledge of the relationship between energy poverty and health, through the Health Survey and specific studies that provide indicators.	2025	Barcelona City Council
2.8. To promote "energy banks" that can help to cover the needs of energy-vulnerable households.	2025	Barcelona City Council

## MEDIUM- AND LONG-TERM ACTIONS (2026-2030):

ACTIONS	DATE	PLAYERS INVOLVED
2.9. To promote actions and agreements to ensure the public supply of potable water in the city, guaranteeing quality, quantity and continuity, at a fair price, for all citizens.	2030	Barcelona City Council AMB, Government of Catalonia and Spanish State

### MUNICIPAL PLAYERS INVOLVED

- Social Rights, Global Justice, Feminism and LGBTI Affairs.
- Barcelona Public Health Agency.
- Urban Ecology.
- Economy, Resources and Economic Promotion.
- Districts.

### MONITORING INDICATORS

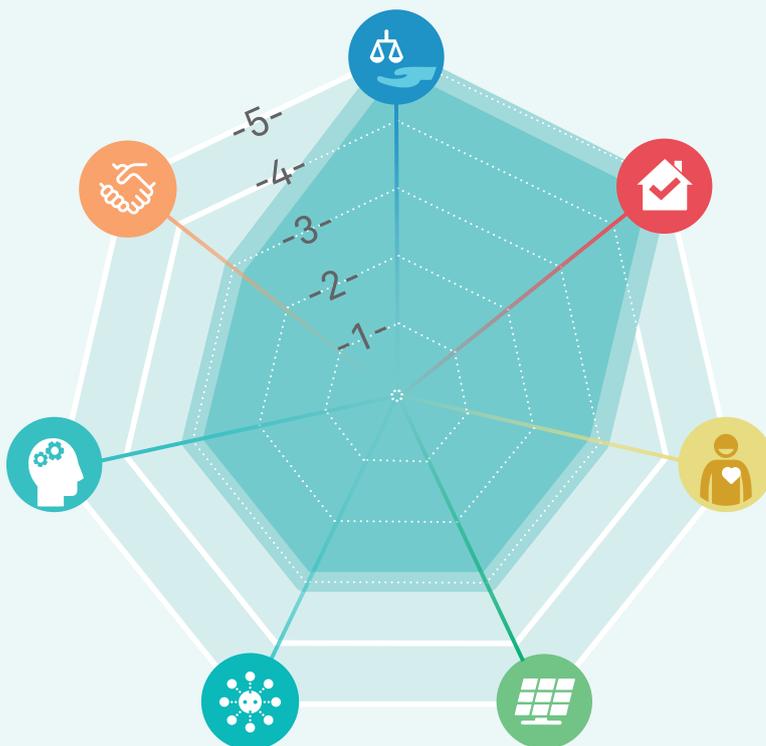
- Number of energy advice point consultations.
- Number of cuts avoided by local sustainable energy action plans.
- Percentage of people suffering from energy poverty (%).

### STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN



## VALUES OF THE CLIMATE EMERGENCY ACTION PLAN

-  SOCIALLY FAIR BARCELONA
-  HABITABLE, SAFE BARCELONA
-  HEALTHY BARCELONA
-  EFFICIENT, RENEWABLE BARCELONA
-  LOW-CARBON, DISTRIBUTIVE BARCELONA
-  BARCELONA THAT LEARNS
-  COMMITTED BARCELONIANS



No cuts

### ASSOCIATED LINES OF ACTION:



Taking care of everyone



To guarantee thermal comfort



Better than new buildings



Reclaiming roof terraces



Climate-based urban transformation



Many more green areas



Not a single drop wasted



Renewables in public areas



Good mobility



Protecting the coastline and our rivers



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Zero waste



Food sovereignty



Cultural action for the climate



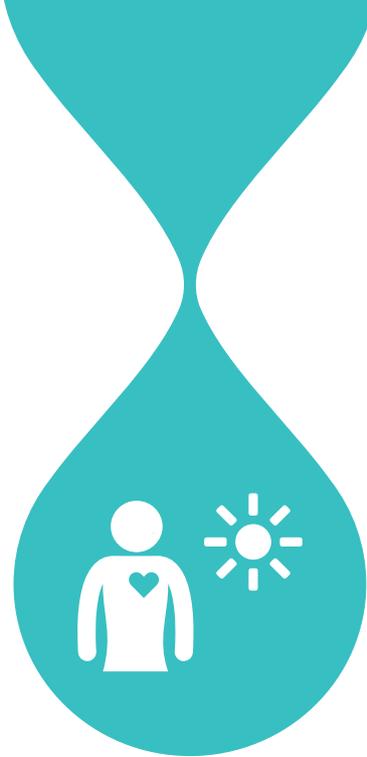
Climate cooperation



Let's get organised

# TO GUARANTEE THERMAL COMFORT

Creating a network of spaces that act as a climate shelter in the event of very high temperatures, and guaranteeing comfortable temperatures in buildings and public spaces.



## JUSTIFICATION AND BENEFITS

Barcelona has suffered eight heat waves in the last 34 years. However, according to the Meteorological Service projections for Barcelona and at the end of the century, they could be significantly more frequent with between one and four a year, depending on the scenario considered. More tropical nights (temperatures above 20°C) and torrid nights (temperatures above 25°C) are also forecast, as well as days with extreme temperatures above 35°C.

High temperatures directly affect people's health, especially those in vulnerable conditions, such as the chronically sick, elderly people and young children, as well as everyday activity in the city and energy consumption patterns. It also needs to be borne in mind that they have an unequal impact on the city, depending on factors such as the state of buildings, the presence of vegetation and socio-economic parameters, among others.

The effects of climate change depend on the district and neighbourhood too. For example, the highest

daytime temperatures are found in Les Corts, Eixample Esquerra, Nou Barris and Ciutat Vella, while the areas with the lowest temperature are next to the coast, thanks to the thermoregulatory effect of the sea. However, at night the situation is reversed, with the highest temperatures recorded on the coast.

So we need to prepare the city to cope with high temperatures by intervening in buildings and public spaces, and also anticipate incorporating and improving services and facilities for the general public during extreme episodes, paying special attention to the most vulnerable.

We need to set out the actions from a gender perspective, incorporating diversity and flexibility criteria into public spaces, facilities and dwellings, to adapt to the new realities and families, and the ageing population (with a higher proportion of elderly women).

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## ACTIONS OF THE PLAN

### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Action Plan to Prevent the Effects of Heat Waves on Human Health (annual).
- Nature Plan Barcelona (2021-2030).
- Urban resilience (2016).
- Barcelona Neighbourhood Plan (2021-2024).
- Plan for Gender justice (2016-2020).
- Programme to Promote the City's Urban Green Infrastructure (2017).

- Tree Master Plan (2017-2037).
- Plan for Energy Saving and Improvements in Municipal Buildings (2017-2020).
- Barcelona Strategy against the Feminisation of Poverty and Job Insecurity (2016-2024).

## ILLUSTRATIVE ACTION



### Action protocols for heat waves, in order to protect the most vulnerable people

In the Specific Municipal Emergency Plan for Heat Waves, Barcelona City Council includes various measures to **protect people who are vulnerable to the consequences of extreme temperatures**. In fact, the heat wave action protocols are automatically kept at the preventive stages from 15 June to 15 September. These stages launch various preventive actions that are activated before the alert stage is reached.

- Staff from the Council's primary-care social services, home-care teams and homeless people care centres receive information and training.
- The general public is informed of what heat waves are and offered advice on how to avoid their effects, in leaflets provided at social services centres, at municipal facilities for the elderly and on the city's beaches.
- The list of vulnerable individuals and individuals and families at risk is updated at every social services centre and through the Catalan health ministry.
- The list of care resources and air-conditioned day centres is updated.
- Vulnerable people receiving home-care services are informed of the steps they need take to protect themselves from the effects of a heat wave.
- A 24-hour helpline, to provide information to those who call, run in coordination with the medical services when health problems are detected, goes into service .

## PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

ACTIONS	DATE	PLAYERS INVOLVED
3.1. <b>To activate a hundred municipal facilities (facilities and parks) to act as climate shelters in the event of an extreme climate emergency</b> (to extend opening hours, equip them, ensure accessibility, inform people, design the website, etc.) <b>and have a reference facility in each district.</b>	2025	Barcelona City Council
3.2. <b>To prioritise the cooling actions</b> (more greenery, redeveloping lakes and fountains to make them accessible, etc.) <b>to be carried out in the territorial areas most vulnerable to heat.</b>	2025	Barcelona City Council

ACCIONS	DATA	AGENTS
3.3. <b>To create the “Barcelona, city of shade” intervention programme on public spaces, to generate more shaded areas.</b> For 2025, to intervene in ten sunshine-exposed spaces (e.g. Passeig Marítim de la Barceloneta, Passeig de l’Exposició del Fòrum) to provide shade and thermal comfort through various solutions: vegetation, fabrics, photovoltaic pergolas or mixed solutions.	2025	Barcelona City Council
3.4. <b>To improve the thermal comfort of 40 state-run schools</b> (Education Consortium), <b>four municipal residences for old people and two early care centres for children with a disability.</b> Increase resilience to changes in the power supply in healthcare, public health and social facilities.	2025	Barcelona City Council Education Consortium, Government of Catalonia, BCN Health Consortium

### SHORT-TERM ACTIONS (2018-2025)

ACCIONS	DATA	AGENTS
3.5. <b>To revise the emergency protocol activation criteria for heat waves,</b> incorporating a variable for night-time temperatures.	2025	Barcelona City Council Government of Catalonia
3.6. <b>To deepen our knowledge of how climate change affects the health and mortality of people in each neighbourhood, through the European research project funded by Climate-fit.city, in which the ASPB and ISGLOBAL participate.</b>	2025	Barcelona City Council Centres de recerca
3.7. <b>To deepen our knowledge of the urban climate by installing a network of fixed weather stations</b> (to collect data that would enable us to know what its effect is on health and other sectors of interest) and <b>temporary or mobile ones</b> (that would enable us to evaluate the effectiveness of the measures applied, such as measuring climate variables before and after pilot interventions in urban space, above all in the settings identified as the most vulnerable).	2025	Barcelona City Council Centres de recerca

### ACTIONS THAT NEED MEDIUM- AND LONG-TERM PROMOTION (2026-2030) :

ACTIONS	DATE	PLAYERS INVOLVED
3.8. <b>To continue identifying, preparing and activating climate-shelter spaces to ensure the degree of desired cover and, if necessary, to create new ones.</b>	2030	Barcelona City Council
3.9. <b>To have a space for water games in a public space in each district.</b>	2030	Barcelona City Council
3.10. <b>To reinforce socio-healthcare facilities and staff teams to deal with exceptional weather events.</b>	2030	Government of Catalonia
3.11. <b>To intervene on the city’s roads and roof terraces and help to mitigate the heat-island effect.</b>	2030	Barcelona City Council

## MUNICIPAL PLAYERS INVOLVED

- Urban Ecology.
- Districts.
- Safety and Prevention.
- Social Rights, Global Justice, Feminism and LGBTI Affairs.
- 2030 Agenda, Digital Transition and Sports.
- Enterprise, Culture and Innovation.
- Barcelona Public Health Agency.
- Barcelona Health Consortium.
- Education Consortium.

## STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN

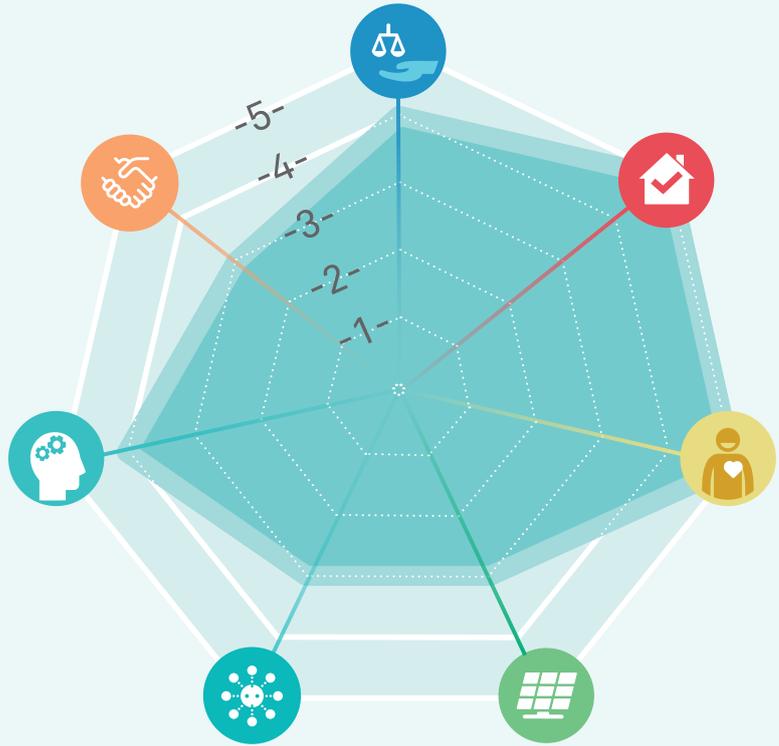


## MONITORING INDICATORS

- Number of shelter spaces made available.
- Number of shelter schools created.
- Number of spaces for elderly people with thermal comfort.
- Members of the population living less than 5 minutes' walk from a climate shelter space (%).
- Number of sunny spaces in which action has been taken to provide shade and thermal comfort.
- Newly created shade area (m<sup>2</sup>).
- Plant cover (hectares).
- Number of annual deaths attributed to heat.
- Number of accessible drinking fountains.
- Number of times the heat wave protocol has been activated.
- Number of water play areas per district.

# VALUES OF THE CLIMATE EMERGENCY ACTION PLAN

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To guarantee thermal comfort

## ASSOCIATED LINES OF ACTION:



Taking care of everyone



No cuts



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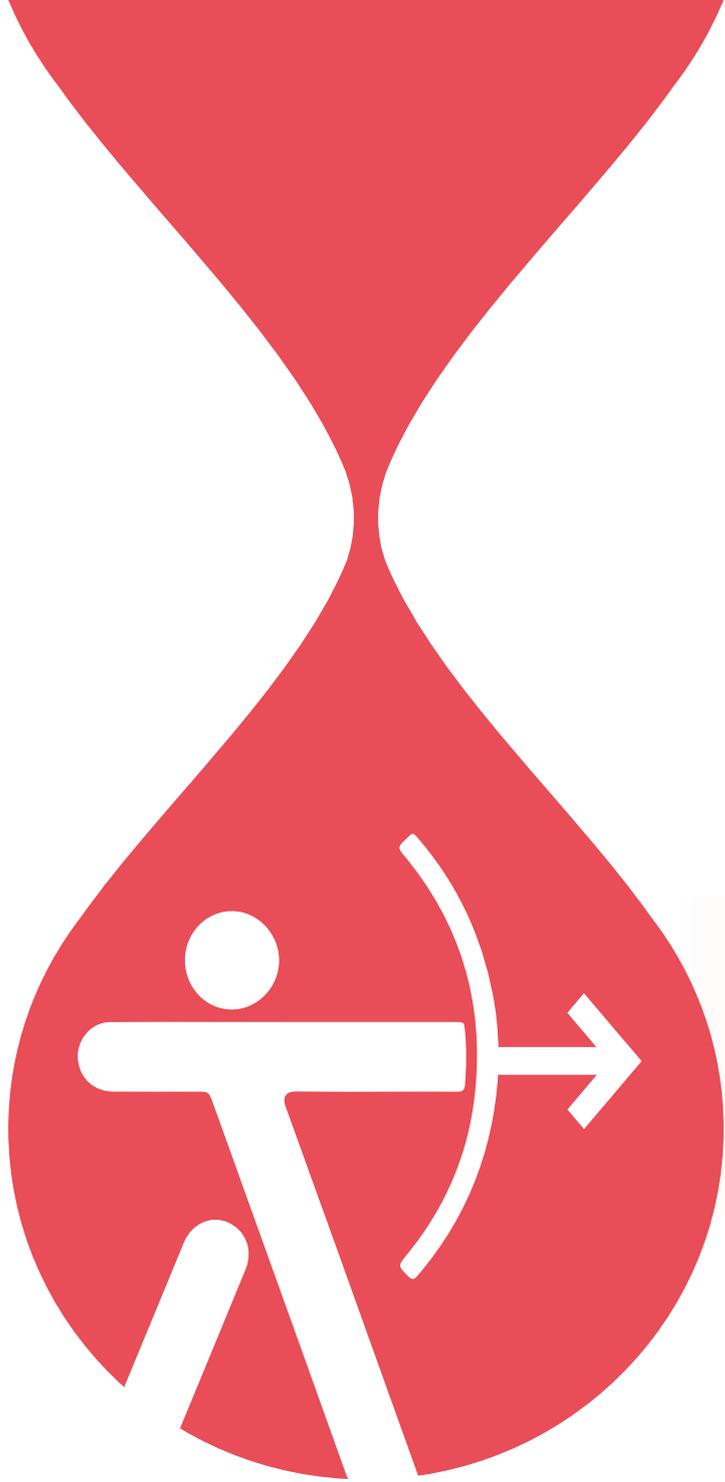


Climate cooperation



Let's get organised





# ENERGY SAVING AND GENERATION

Buildings consume a great deal of energy. But they can also be productive and independent, and generate energy from renewable sources installed on roof terraces, party walls or facades.

The Climate Emergency Action Plan forecasts the energy renovation of existing buildings on a massive scale and new buildings which are exemplary in that respect, with more locally produced solar energy, so we can get closer to a self-sufficient model and buildings with almost zero consumption. These

actions will enable energy to become more accessible and more affordable to everyone. Roofs, walls and facades can be used to plant vegetation, retain rainwater, generate energy and create meeting places.



## GOALS AND TARGETS FOR 2030:

-  Renovate 20% of residential buildings that are over 40 years old.
-  Reduce the 7% of GHG emissions associated with the energy consumption of municipal buildings and facilities.
-  Reach 34,100 m<sup>2</sup> of green roofs, walls and facades.
-  Install 100 emblematic productive roofs or facades on municipal public buildings (10 green roofs in 4 years).

LINE OF ACTION

# 4

## BETTER THAN NEW BUILDINGS

### Rehabilitate buildings to save energy



#### JUSTIFICATION AND BENEFITS

**The domestic, commercial and service sectors account for nearly 60%** of all energy consumed in the city, with a final energy consumption of around 10,000 GWh a year. In terms of greenhouse gases, that represents 40% of all emissions recorded in the city. And a large part of that consumption corresponds to the buildings where the activity is carried out.

The total gross-floor area of buildings in Barcelona in 2017 came to 116.6 million m<sup>2</sup>, 11% more than in 1999. Over half of that corresponded to the residential sector (63 million m<sup>2</sup>), followed by industrial sector premises, warehouses and car parks (23 million m<sup>2</sup>). Note too the area allocated to offices and service sector of 22 million m<sup>2</sup>.

The built surface area in Barcelona in 2014 was 124.5 million m<sup>2</sup>, 16% more than in 1999. Over half of that corresponded to the residential sector (64 million m<sup>2</sup>), followed by industrial sector premises, warehouses and car parks (25 million m<sup>2</sup>). Also noteworthy is the surface area dedicated to offices and the commercial sector (7.3 and 8.4 million m<sup>2</sup> respectively).

As regards energy, 106,400 existing buildings and 240 new-build buildings have been energy-certified (2015). However, those figures only correspond to a percentage of all the buildings in the city. Categories D and E account for 58.2% of certifications, while 36.4% have a consumption and emissions above the average for the existing stock (categories F and G), 5.2% are in the efficient categories (B and C) and only 0.2% are very efficient (category A). In the case of new-build buildings, 38.3% have a D or E rating, 45.8% are efficient buildings (B and C) and only 15.8% are very efficient (A).

These percentages show that new-build buildings are more efficient and that there is considerable potential in existing buildings for improving energy efficiency and reducing greenhouse gas emissions.

The average age of residential buildings is more than 65 years, so they do not comply with today's standards and require a lot of energy. In fact, 72% of the surface area of residential buildings was built before 1979, in other words before thermal standards were introduced.

In that context, the energy renovation of buildings, dwellings and facilities takes on enormous importance. Renovating existing housing and buildings should enable a reduction in energy demand and, consequently, mean less effort on the part of families to cover their energy costs, a key issue, especially in the more vulnerable parts of the city.

Although there are specific energy regulations for new buildings, they are often based on the technology itself and not the features. Therefore, we need to promote the construction of efficient buildings and facilities and make sure they produce part, if not all the energy they require and, in that way, obtain buildings with almost zero consumption.

We also need to work on developing regulations adapted to the city's reality and ensure they are applied and complied with, as well as on tools (both administrative and economic, including incentives and discounts, among others), so the action on construction is effective and builders assume their responsibility as far as reducing consumption and emissions in the city is concerned.

From a municipal perspective, buildings and facilities account for more than 50% of municipal energy consumption. So the City Council has to continue its efforts to secure energy improvements in the existing stock and thus set an example of the possibilities that exist. It is also important to show that buildings can generate part of their energy needs and, in that regard, the City Council needs to pursue its policy of installing power generation systems in public buildings to demonstrate their viability, while encouraging private owners to do likewise. One example of this is the Programme to Promote Solar Power Generation in Barcelona.

So, acting on construction quality and building features, as well as on how they behave in energy use and management terms, at all levels and in all sectors (residential, commercial, service, public and industrial), and ensuring proper maintenance, with the necessary degree of specialisation and resources, are key factors in achieving significant reductions in final energy consumption and, consequently, in the associated emissions. That also requires the contribution of an empowered citizenry aware of the need to change their habits and consume less more efficiently, an area where there is a long way to go, both on a public and a private level.

## ACTIONS OF THE PLAN

### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Barcelona Neighbourhood Plan (2021-2024).
- Plan for Energy Saving and Improvements in Municipal Buildings (2017-2020).
- Programme to Promote Solar Power Generation in Barcelona (2017-2019) and subsequent editions (2020-2030).

## ILLUSTRATIVE ACTION



### Can Portabella, a renovated facility

The renovation of the Can Portabella civic centre shows how the incorporation of energy efficiency criteria, prioritising the use of wood, gives the building a thermal inertia that ensures warm temperatures in winter and cooler temperatures in summer. Twelve centimetres of wood fibre provide external insulation

for the facade and a large side window allows natural light into all the rooms practically the whole day. There is a ventilated roof with 24 cm of recycled cotton insulation that collects photovoltaic power. The battery-powered lift enables considerable energy saving on one of the building's main energy consumers. And, in addition to all that, it has a natural light well and paved insulation in the floor.

Can Portabella ended 2016 with a positive energy balance, as it produced more than it consumed. This model is an example for future projects, as the City Council's aim is to work along these lines to ensure efficiency and minimise energy expenditure in all municipal facilities.

Thanks to architectural strategies and building solutions, the energy demand for heating and cooling is under 14 kWh/m<sup>2</sup> a year. The maximum power required for the air-conditioning system is 10 kW. These facilities are more typical of a single-family building than an 800 m<sup>2</sup> tertiary one. These savings enable the installation of 40 m<sup>2</sup> of photovoltaic panels on the roof, which will provide over 12,000 kWh a year, above the building's estimated demand.

This model is an example for future projects, as the City Council's aim is to work along these lines to ensure efficiency and minimise energy expenditure in all municipal facilities.

## PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

ACTIONS	DATE	PLAYERS INVOLVED
4.1. <b>To study and establish the technical specifications for the new thermal comfort standards that Barcelona wants to achieve locally, and work on changing the mentality of building promoters and users.</b>	2020	Barcelona City Council
4.2. <b>To develop a regulatory framework for using heating/air conditioning in the commercial and services sector</b> , in order to avoid energy being wasted thanks to a social conscience, regulating, among other things, the uses of outdoor heaters and the closure or automatic actions of exterior doors.	2020	Barcelona City Council

## ACCIONS QUE CAL IMPULSAR A CURT TERMINI (2018-2025):

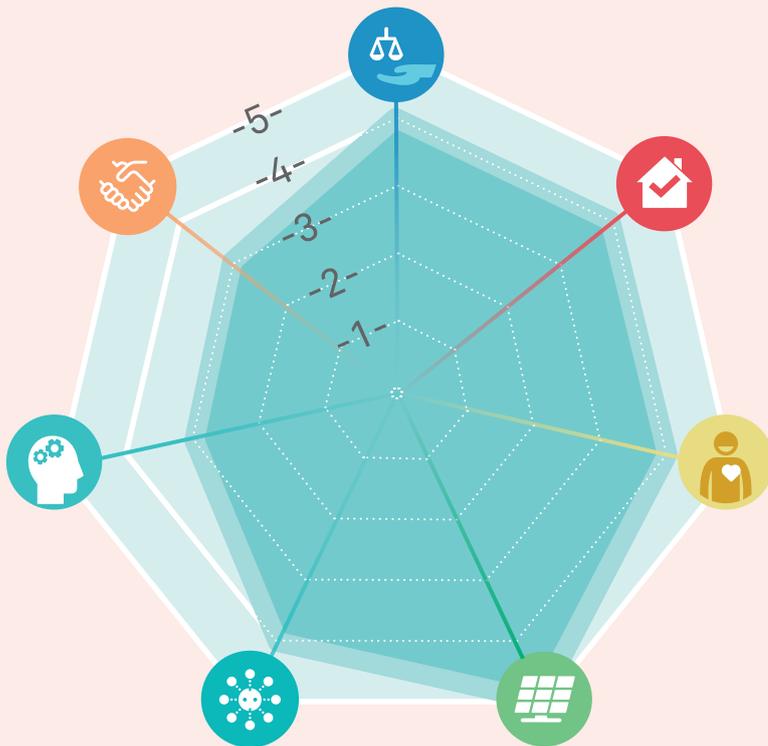
ACTIONS	DATE	PLAYERS INVOLVED
4.3. <b>To create communication and publicity initiatives and encourage energy saving in buildings:</b> <ul style="list-style-type: none"> <li>• Energy-saving marathon involving awareness-raising tasks among council workers (and centre users or visitors) in various kinds of municipal buildings (2018).</li> <li>• Tactical communication actions (ongoing).</li> <li>• Environmental education workshops (ongoing).</li> <li>• Consolidation of the energy resources map (2018).</li> <li>• Publication of handbooks for the public and professionals on developing power generation facilities (2018).</li> <li>• Publication of a manual on the procedure for connecting generation systems for self-consumption (2018).</li> <li>• Dissemination of advice and tools to foster energy saving (energy calculator) (2018).</li> </ul>	Ongoing	Barcelona City Council
4.4. <b>To monitor the energy of buildings, dwellings and public facilities</b> and thereby find out about consumption and the application of energy improvements (ongoing).	Ongoing	Barcelona City Council
4.5. <b>To analyse how long it will take for new, more environmentally responsible systems</b> to be competitive with traditional systems and what the cost-benefit result will be in economic, social and environmental terms.	2020	Barcelona City Council
4.6. <b>To study building systems and solutions adapted to Barcelona to improve their protection against heat and passive cooling</b> , and supplement the current building regulations in force by establishing local technical and regulatory specifications. To incorporate criteria for protecting buildings against climate episodes (e.g. strong winds).	2025	Barcelona City Council
4.7. <b>To implement a building-energy byelaw which ensures that new buildings or those undergoing comprehensive renovation in the city have minimal energy demands and maximum energy generation.</b>	2025	Barcelona City Council

**MEDIUM- AND LONG-TERM ACTIONS (2026-2030):**

ACTIONS	DATE	PLAYERS INVOLVED
4.8. <b>To ensure the efficient energy management of municipal services associated</b> with the water cycle, as well as waste management and collection, and also optimise the energy management and supplies of public lighting and municipal buildings and offices (including infant and primary schools), <b>to cut electricity consumption in the buildings acted on by 10% by 2024.</b>	2030	Barcelona City Council
4.9. <b>To Develop and consolidate the existing heating and cooling grids in the city, and define and promote a new one in La Sagrera.</b>	2030	Barcelona City Council Private managers

**VALUES OF THE CLIMATE EMERGENCY ACTION PLAN**

-  SOCIALLY FAIR BARCELONA
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## MUNICIPAL PLAYERS INVOLVED

- Urban Ecology.
- Economy, Resources and Economic Promotion.
- 2030 Agenda, Digital Transition and Sports.
- Districts.
- Social Rights, Global Justice, Feminism and LGBTI Affairs.

## MONITORING INDICATORS

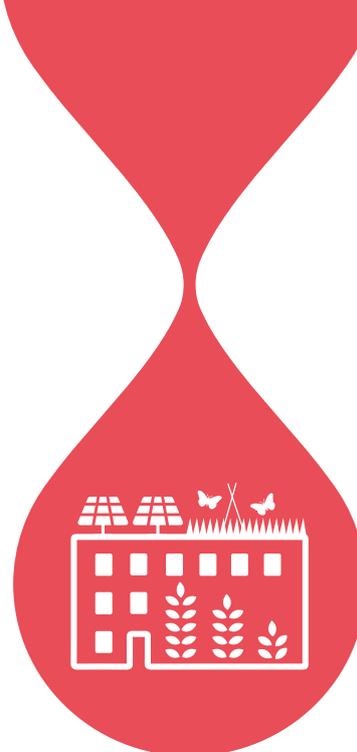
- Number of buildings with A and B energy ratings.
- GHG emissions associated with energy consumption in municipal buildings and facilities (tonnes of CO<sub>2</sub>).
- Renovated buildings of over 40 years of age (%).

## STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN



## RECOVERING TERRACE ROOFS

To make the most of roofs, walls and party walls for generating energy, incorporating greenery and collecting water.



### JUSTIFICATION AND BENEFITS

A dense, compact city such as Barcelona has to make the most of every square metre to correct the adverse effects of climate change. The use of roofs, walls and party walls as productive spaces opens up new urban spaces for thermal activities and various uses, with the dual aim of mitigating the effects of climate change and adapting to it by involving the general public. Terraces, on flat and slightly inclined roofs, account for 67% of total roof surface area in the city, which is 1,764.4 ha.

Those surfaces, together with those of the facades, become potential settings for providing socio-environmental services with added value because they offer the possibility of:

- Generating renewable energy (energy roof)
- Adding plants and biodiversity (green roof)
- Growing food (food roof).
- Storing water (reservoir roof).
- Cooling the city (cool roof).
- Providing a social use (active roof).

There have already been several initiatives promoting productive roofs in Barcelona, such as a number of studies on green roofs, a government measure promoting living terraces and green roofs in the city, the publication of the Guide to Living Terraces and Green Roofs or the Programme to Promote Renewable Energy Generation and various lines of subsidies.

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### ACTIONS OF THE PLAN

#### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Promoting living terraces and green roofs in Barcelona (2014).
- Programme to Promote the City's Urban Green Infrastructure (2017).
- Programme to Promote Solar Power Generation in Barcelona (2017-2019) and subsequent editions (2020-2030).
- Nature Plan Barcelona (2021-2030).

## ILLUSTRATIVE ACTION

### Two competitions for promoting green roofs



Barcelona City Council's Municipal Institute of Urban Landscape has already convened two calls for entries to the Green Roofs Competition, an initiative promoting the establishment of new green roofs in the city. The first edition, which was held in 2017, awarded prizes to ten green roofs in housing-block buildings and to teaching, health and other facilities. All these projects have had a strong environmental, social and landscaping impact. Their implementation led to an extra 5,500 m<sup>2</sup> of greenery, an extra 217 m<sup>2</sup> of solar panels and two windmills, four new rainwater collection facilities, and facilities for wildlife such as ponds for amphibians, insect hotels, bird boxes and an aquaponics system.

The second edition, which was launched in the second quarter of 2020, provides a subsidy of up to 1,500 euros for the first 50 pre-selected proposals as technical expenses for preparing preliminary technical work. Ten winning projects will be chosen from these proposals, which will receive a 75% subsidy for the initiatives and technical studies required, up to a limit of 100,000 euros for each green roof.

## PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

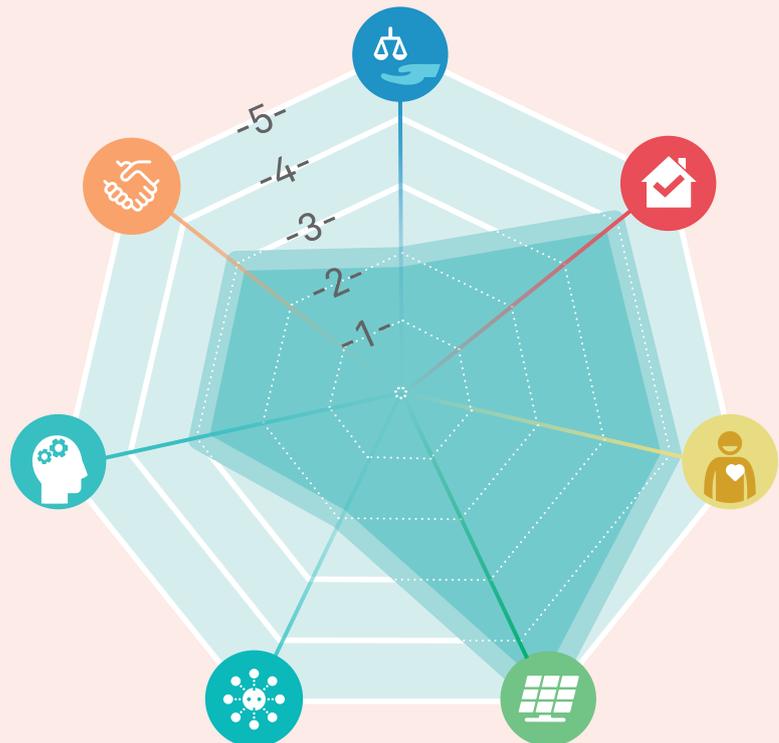
ACTIONS	DATE	PLAYERS INVOLVED
<p><b>5.1. To develop ten green roofs and façades on municipal buildings</b> to serve as an example and, under agreements with the private sector, promote a further fifty productive roofs on buildings, including green, energy, reservoir or reflector roofs through a call for applications for grants and discounts, competitions and other mechanisms. Information campaigns will be held to publicise them.</p>	Ongoing	Barcelona City Council
<p><b>5.2. To fill the city's roof terraces with solar installations, offering facilities for incorporating them</b> (reinterpretation of regulations and simplification of procedures) <b>and boosting the financial incentives, such as grants, subsidies, tax breaks (IBI, ICIO, IAE) and other funding mechanisms,</b> to incorporate 10 MWp of photovoltaic energy and 7 MW thermal solar energy in residential and private tertiary buildings by 2025.</p>	Ongoing	Barcelona City Council Public and private
<p><b>5.3. To start a process whereby up to 25 MWp of photovoltaic energy is installed in big urban spaces</b> (industrial roofs, big tertiaries and pergolas or structures in industrial and logistics environments) by 2025.</p>	2030	Barcelona City Council CZF, Bon Pastor Industrial Estate, industries and operators

**SHORT-TERM ACTIONS (2018-2025):**

ACTIONS	DATE	PLAYERS INVOLVED
5.4. To draw up a byelaw to promote productive roofs for newly constructed buildings, major renovations and changes of use in buildings, which includes incentives and a proposal for the necessary regulatory changes to allow agriculture and construction elements on roofs, and which includes a commitment to maintenance.	2018	Barcelona City Council
5.5. To draw up technical instructions for public buildings that include the use of productive roofs/ walls/ façades.	2018	Barcelona City Council
5.6. To approve a byelaw that makes it compulsory for grey, rain or regenerated water to be used in new buildings or major renovations.	2025	Barcelona City Council

**VALUES OF THE CLIMATE EMERGENCY ACTION PLAN**

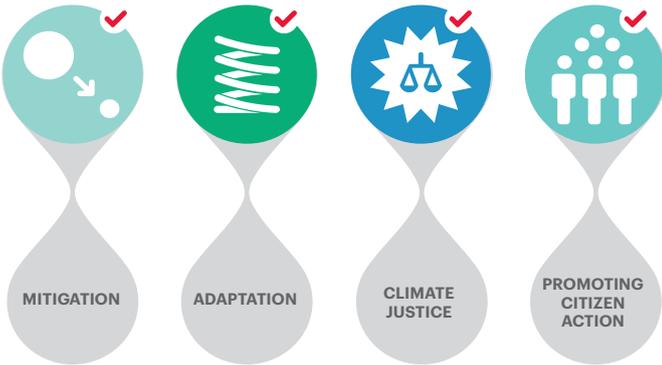
-  SOCIALLY FAIR BARCELONA
-  HABITABLE, SAFE BARCELONA
-  HEALTHY BARCELONA
-  EFFICIENT, RENEWABLE BARCELONA
-  LOW-CARBON, DISTRIBUTIVE BARCELONA
-  BARCELONA THAT LEARNS
-  COMMITTED BARCELONIANS



## MUNICIPAL PLAYERS INVOLVED

- Urban Ecology.
- Economy, Resources and Economic Promotion.
- 2030 Agenda, Digital Transition and Sports.
- Social Rights, Global Justice, Feminism and LGBTI Affairs.
- Districts.

## STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN

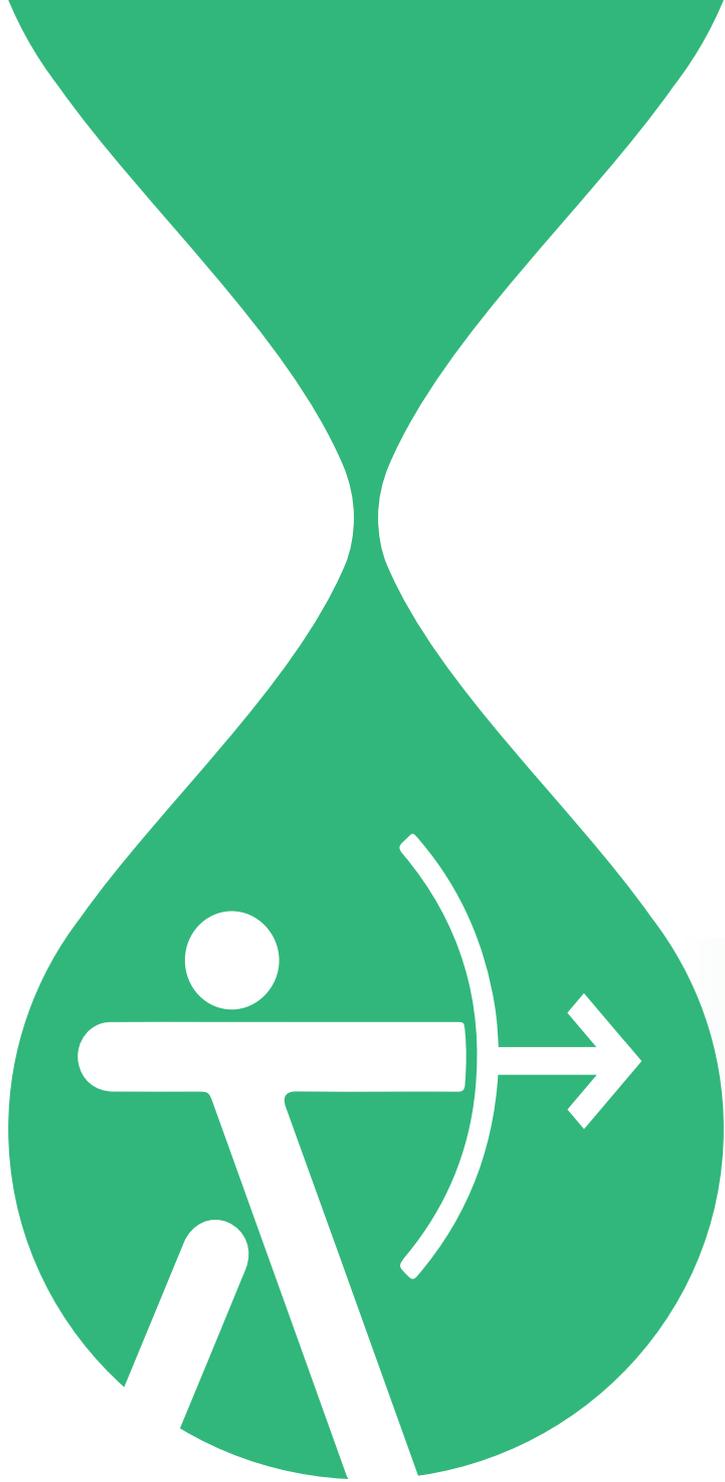


## MONITORING INDICATORS

- Number and surface area (in hectares) of constructed productive roofs by type:
  - Energy roof.
  - Green roof.
  - Agriculture roof.
  - Reservoir roof.
  - Active roof.
- Surface area of green walls and façades (m<sup>2</sup>).
- Number of emblematic productive roofs or façades on municipal public buildings.
- Solar power generation (kilowatts per hour, number and type of installations, square metres of thermal solar surface area, and photovoltaic picowatts).







# URBAN AND MOBILITY MODEL

City planning also requires a climate approach where energy efficiency and self-consumption are key elements, and which also fosters cycling and pedestrian mobility.

The Climate Emergency Action Plan encourages planners to incorporate a metabolic logic in urban space planning, to ensure that it not only functions but is also functional and guarantees

people's well-being at the same time. Creating much more green space and infrastructure in the city, making use of alternative water resources to cut potable water consumption, solar power generation, healthier and more sustainable mobility, and the conservation of the coastline are all strategies that need pursuing.



## GOALS FOR 2030

- ✓
**To reduce GHG emissions by 50% compared to 1992.**
  - To increase solar power generation fivefold.
  - To reduce private motor vehicle travel by 20%.
  - To procure 100% low-carbon public transport buses, taxis and municipal fleets (2025).
  - To have 95% of the population living less than 300 metres away from a bike lane (2018).
  - To have 15 km of pacified streets (Superblocks) (2025).

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- ✓
**To achieve 1.6 km<sup>2</sup> more green space and infrastructure.**
  - To increase tree cover by 5% (2037).
  - To increase the percentage of adapted tree species from 30% to 40%.
  - To take action in 10 sunny spaces to provide shade and thermal comfort (2025).
  - To create 10 biodiversity shelters.
  - To unpave 3 hectares and reclaim organic soil.

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- ✓
**To reduce domestic drinking water consumption to 100 l/inhab/day.**
  - To increase the use of underground water by 2.7 hm<sup>3</sup>.
  - To replace 100,000 m<sup>3</sup>/year of alternative water resources used for municipal uses.
  - To achieve 10 hm<sup>3</sup> of additional drinking water in collaboration with other authorities (2050).
  - To have 200,000 m<sup>3</sup> of sustainable urban drainage systems (SUDS) (2025).

# CLIMATE-BASED URBAN TRANSFORMATION

To transform public spaces to improve their environmental and health conditions, reduce spaces for private vehicles and allocate them instead to social uses.



## JUSTIFICATION AND BENEFITS

The way we plan and design the city, both public spaces and buildings, is a key factor in how it can reduce greenhouse gas emissions and respond to the effects of climate change. Its cross-cutting character calls for the application of structural measures capable of having a powerful impact on the urban environment.

Incorporating the climate variable (which includes the urban heat island effect) as well as resilience and sustainability criteria in the process is a very complex task and involves many players. What we understand by the urban development process begins with planning, continues with urban management and implementing the plan (buildings and public areas), and ends with maintaining the urban spaces. So, although projects have been promoted which, to varying degrees, include a socio-environmental perspective and even though there are many sectoral projects under way, there is still a need for a holistic, systematised and comprehensive vision.

In that regard, it is very significant that the **Metropolitan Urban Development Master Plan** (PDUM) is being drawn up at the same time as the Climate Emergency Action Plan, Bearing in mind that

the drafting of this new urban planning framework provides a very important opportunity for introducing resilience and sustainability criteria.

Because public space is also becoming a space for providing care, where people can rest and recover from illnesses or learn to walk, grow, play and socialise. So, spaces for providing care are not relegated to the domestic sphere but instead find a balance with the street as a “place for living” which makes it possible for there to be a balance between professional and personal spheres, and makes community life possible, the creation of support networks, etc.

Similarly, the superbloc project is an opportunity for removing cars and, therefore, reducing greenhouse gas emissions while opening up more green spaces (adaptation). We need an everyday urbanism, which plans and designs for everyone, whose actions range from designing streets to making them safe and accessible for everyone, which considers mobility infrastructures and associated modes so that the citizen activity associated with caring, raising children and domestic logistics is maintained and strengthened.

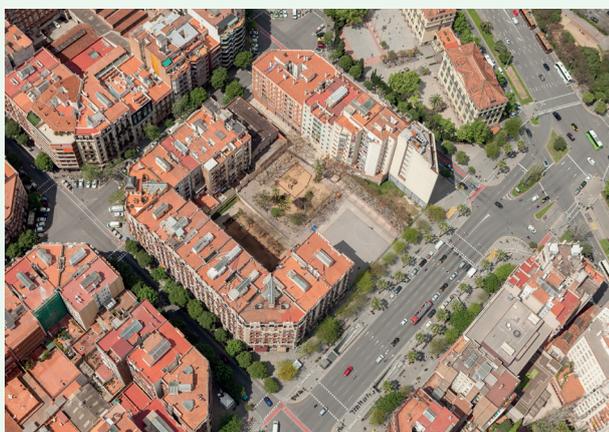
## ACTIONS OF THE PLAN

### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- “Filling the streets with life” by creating Superblocks in Barcelona (2016).
- Plan for Gender justice (2016-2020).
- Programme to Promote the City’s Urban Green Infrastructure (2017).
- Nature Plan Barcelona (2021-2030).
- Barcelona Neighbourhood Plan (2021-2024).

### ILLUSTRATIVE ACTION

#### Reclaiming public space in Eixample’s block interiors



The Eixample block interior map already shows 48 reclaimed interiors put at the disposal of the public. The project to reclaim these spaces began in 1987 and continues to make progress towards the target of people having a green area within 200 metres of their homes.

These re-greened spaces are local spaces that provide opportunities, fostering social cohesion (they are often linked to facilities and provide children’s recreation areas), health (some are equipped with keep-fit areas for elderly people), leisure and even cooling down (some have incorporated small urban beaches). Achieving this required specific amendments to the General Metropolitan Plan.

### PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

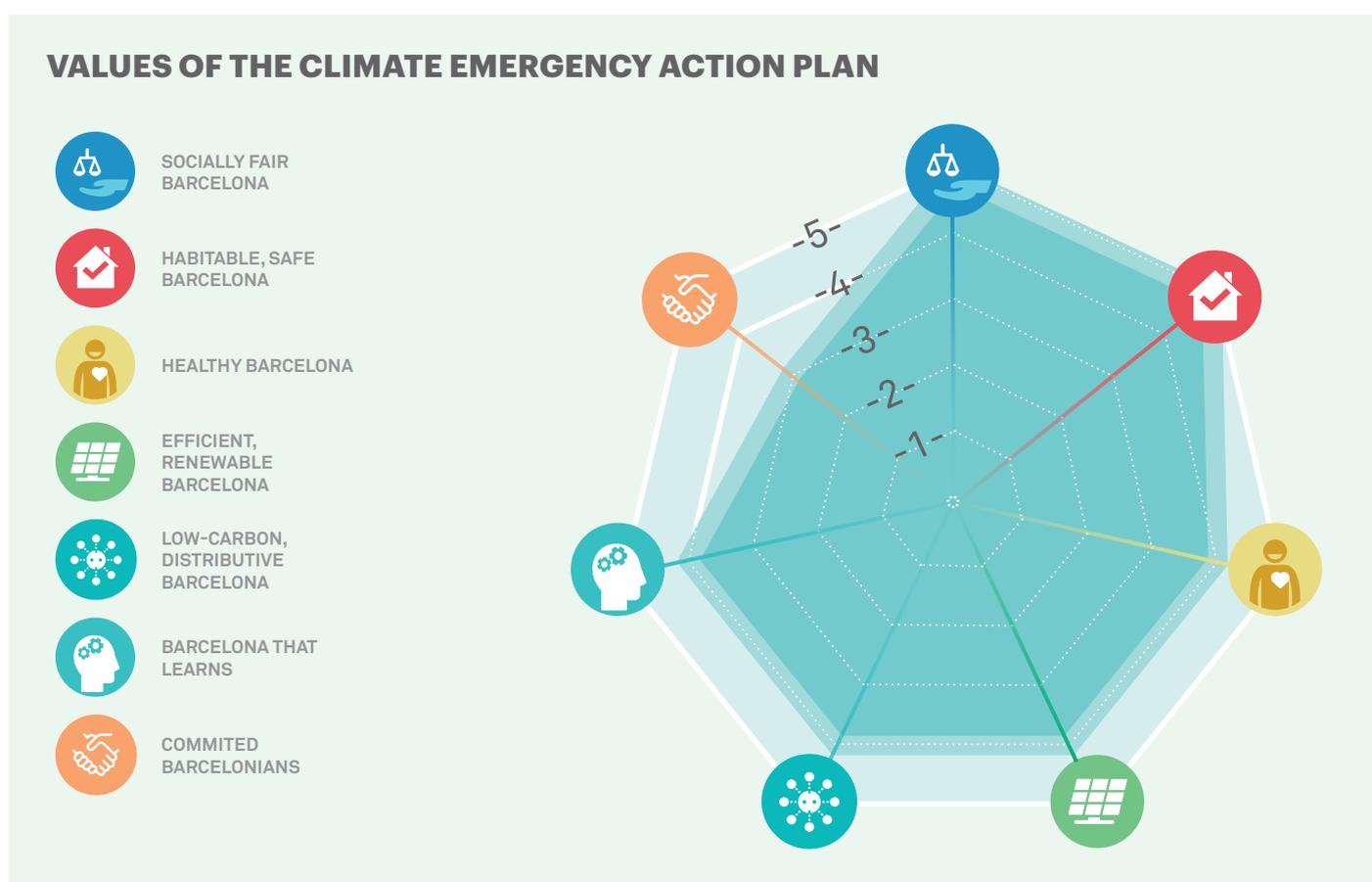
ACTIONS	DATE	PLAYERS INVOLVED
<p><b>6.1. To influence higher-level planning tools</b>, such as the Urban Development Master Plan (PDU) and urban planning legislation (Catalan Urban Planning Act) <b>to incorporate planning considerations</b> that ensure the presence of quality green infrastructure, such as green corridors, reserved spaces that allow water to infiltrate the subsoil, the protection of areas at risk from climate change or agricultural use on a metropolitan scale.</p>	Ongoing	Barcelona City Council

## SHORT-TERM ACTIONS (2018-2025):

ACTIONS	DATE	PLAYERS INVOLVED
6.2. <b>To adapt the necessary current urban-planning regulations so they can help to achieve climate change mitigation and adaptation goals.</b>	Ongoing	Barcelona City Council
6.3. <b>To introduce the climate emergency vector in strategic metropolitan transformations</b> such as: Parc de les Glòries, Avinguda Meridiana, Parc de la Sagrera and the seafront.	Ongoing	Barcelona City Council
6.4. <b>To analyse how climate change specifically affects each district to identify possible risks and vulnerabilities</b> (heat, presence of people vulnerable to climate change, buildings in a bad state of repair, a lack of green spaces etc.) and define what specific action is required, in collaboration with existing plans and their updated versions, such as the Neighbourhood Plan or the Nature Plan Barcelona.	2020	Barcelona City Council
6.5. <b>To locate and characterise the areas at risk</b> (owing to extreme heat, flooding, power cuts, water availability etc.)	2020	Barcelona City Council
6.6. <b>To draw up a design guide with sustainability and resilience criteria</b> (based on the sustainable urban planning workshops) for architects, engineers and so on, as well as key players such as research centres and universities.	2020	Barcelona City Council
6.7. <b>To protect schools with environmental and road safety measures.</b> Action at 200 schools up to 2024.	2024	Barcelona City Council
6.8. <b>To draft a Greenery and Biodiversity Charter, for the purposes of having a tool available that features the technical, environmental and design criteria which will have to be borne in mind when planning green spaces and urban trees, in the spirit of conserving and enhancing the city's plant and animal diversity.</b> This charter must include the technical aspects that plans for a green space or planting roadside trees have to comply with: soil quality, soil volume, planting distances, distances between trees and lamp-posts or other urban furniture, etc. It also has to determine which species are the most suitable to be selected (depending on the necessary resources, which produce allergens and which avoid pests and infestations) as well as recommendations for obtaining more services.	2025	Barcelona City Council
6.9. <b>To differentiate between the various urban fabrics according to the risks that affect them so corrective measures can be incorporated in planning reviews.</b>	2025	Barcelona City Council
6.10. <b>To keep sufficient space in the soil and subsoil to enable the provision of the necessary climate services</b> (greater water infiltration, better quality of soil to allow plants to grow properly, etc.)	2025	Barcelona City Council

## MEDIUM- AND LONG-TERM ACTIONS (2026-2030) THAT NEED PROMOTING:

ACTIONS	DATE	PLAYERS INVOLVED
<p><b>6.11. To rethink and adapt criteria in project and works protocols and in the technical specifications for urban spaces,</b> to equip them with a more cross-cutting vision and ensure compliance with these sustainability and resilience criteria in urban transformation projects.</p>	2030	Barcelona City Council
<p><b>6.12. To speed up the introduction of renewable energies in Catalan territory and ensure that 50% of electricity consumption in Catalonia comes from a renewable source by 2030,</b> as set out in Decree Act 16/2019, of 26 November, on emergency measures for the climate emergency and promoting renewable energy, and Act 16/2017, of 1 August, on climate change.</p>	2030	Generalitat de Catalunya



## MUNICIPAL PLAYERS INVOLVED

- Urban Ecology.
- Barcelona Public Health Agency.
- Social Rights, Global Justice, Feminism and LGBTI Affairs
- Districts.

## MONITORING INDICATORS

- Number of projects evaluated by means of project and works protocols.
- Soil and subsoil surface area reserved for the provision of climate services (m<sup>2</sup>).
- Number of schools protected with environmental and road safety measures.

## STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN



## MANY MORE GREEN AREAS

Achieving another 1.6 Km<sup>2</sup> of green surface area and preserve species that are vulnerable to climate change.



### JUSTIFICATION AND BENEFITS

Biodiversity, which refers to the variety of life, is a key element in the functioning of ecosystems that provide many services, such as water and microclimate regulation, better air quality, food supply, etc. The measures so far adopted to preserve biodiversity are necessary but still not enough.

Climate change could have serious repercussions on the city's ecosystems and alter part of the benefits they bring, even encourage the presence of some pests (cockroaches, monk parakeets, rats and mice). So we need to analyse the best way of dealing with it to prevent its effects from becoming a threat to health or leading to a loss of diversity and ecological functionality and, therefore, lower quality of life for Barcelona's residents.

Greenery plays a key role in such public spaces, with all its associated environmental and social benefits; and it therefore has to be planned and presented with communal life, accessibility and fairness as its key factors.

In addition, rising temperatures and variations in humidity may affect some insect populations and increase the risk of transmission of certain

arboviruses (such as dengue fever and yellow fever and the Zika, West Nile and chikungunya viruses). Various cases are reported every year and supervision and control protocols have already been established.

Another obvious concern on which there is consensus is the sustained loss of biological diversity in recent decades, both in terms of populations as well as species, habitats and landscapes. Some wildlife species that live in Barcelona are particularly sensitive to climate change (amphibians, butterflies, bats, local birds, etc.) and require conservation measures.

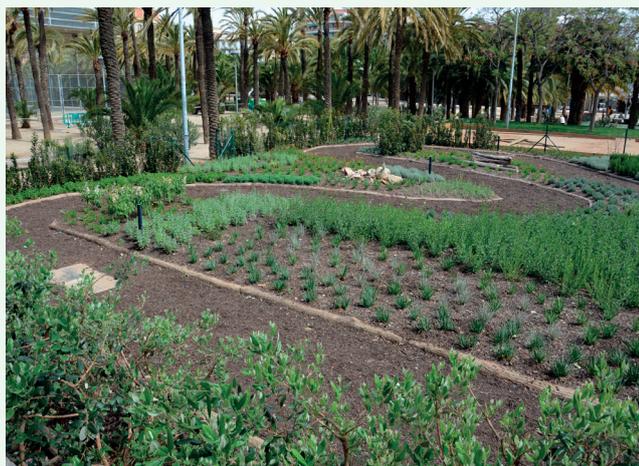
For example, the **Barcelona's Commitment to the Climate sets a target of an additional 1.6 km<sup>2</sup> of green space by 2030**. The Programme for Promoting Urban Green Infrastructures (PIVU) spells out part of the Green Infrastructure and Biodiversity Plan and also specifies how to achieve those additional 1.6 km<sup>2</sup>. It is also worth mentioning the Tree Master Plan (PDA), which sets out the tree selection criteria and promotes a diversity of species, adapted to the urban ecosystem and climate, and anticipates a 5% increase in tree cover by 2037.

## ACTIONS OF THE PLAN

### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS

- Eliminating the use of glyphosate in Barcelona's green spaces, streets and squares (2015).
- Programme to Promote the City's Urban Green Infrastructure (2017).
- Tree Master Plan (2017-2037).
- Nature Plan Barcelona (2021-2030).

### ILLUSTRATIVE ACTION



#### The Parc de Joan Miró includes an area of special interest for biodiversity

This 448 m<sup>2</sup> area encourages the presence of wildlife by means of carefully selected nectariferous plants, which provide food for certain species of butterflies and other pollinators. Small rockeries and tree trunks also offer shelter and feeding possibilities to birds, insectivores and other beneficial species of fauna.

Almost 99% of the garden is made from organic material, while the remaining 1% is for sprinklers and footpaths, so people can walk through the garden without treading on planted areas.

### PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

ACTIONS	DATE	PLAYERS INVOLVED
7.1. <b>To increase public greenery in Barcelona by 40 hectares so it provides high levels of socio-environmental services, prioritising places with the biggest deficit</b> (e.g. Av Meridiana, the La Sagrera linear park, La Marina) and <b>approve an instrument that will enable effective protection of private greenery.</b>	2025	Barcelona City Council

### SHORT-TERM ACTIONS (2018-2025):

ACTIONS	DATE	PLAYERS INVOLVED
7.2. <b>To continue with the fire-prevention and extinction services,</b> paying special attention to areas that are more vulnerable to the risk of fire and the hillside neighbourhoods bordering woodland. To promote and ensure sustainable forest management	Ongoing	Barcelona City Council
7.3. <b>To incorporate climate change criteria into the Special Plan for protecting the natural environment and landscape of the Collserola Mountain Range nature park.</b>	2020	Barcelona City Council
7.4. <b>To find solutions to the problem of mosquito reproduction in scuppers and reservoir roofs.</b>	2020	Barcelona City Council

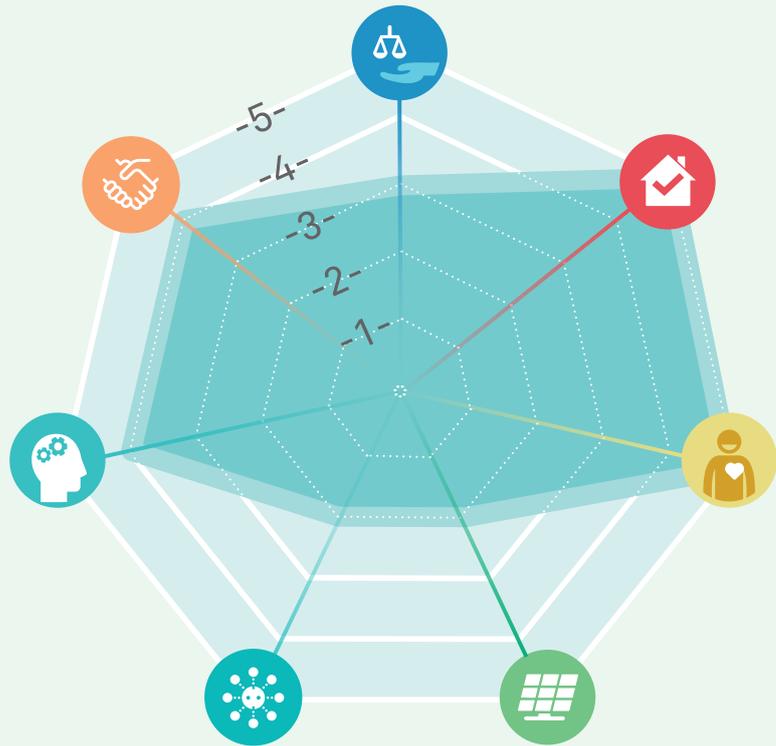
ACTIONS	DATE	PLAYERS INVOLVED
7.5. <b>To consolidate the control programmes for arboviruses and other diseases transmitted by vectors and the mosquito-control protocols.</b>	2025	Barcelona City Council
7.6. <b>To promote urban green corridors</b> , paying special attention to the Ciutadella-Collserola corridor with the intervention on Carrer de Pi i Margall.	2025	Barcelona City Council
7.7. <b>To step up comprehensive pest control</b> (cockroaches, tiger mosquitoes, etc.) <b>with minimum use of insecticides and biocides.</b>	2025	Barcelona City Council
7.8. <b>To produce a catalogue of tree species</b> to be prioritised according to their capacity for resisting certain extreme climate conditions (heat and scarce water) while providing ecosystem services (thermal regulation, shelter and food, pollutant capture, etc.) after conducting the relevant studies and in accordance with the Tree Master Plan (PDA).	2025	Barcelona City Council
7.9. <b>To determine the area</b> (with high temperatures, a large exposed population, intense use of public spaces and presence of groundwater) <b>where more thermoregulatory-type plants are needed or not needed and where areas perhaps with xerophilous plants</b> (which are adapted to dry environments and require little water) <b>are already sufficient. We need to prioritise native or well-adapted species in parks and promote evergreens, and ensure that public-space projects introduce these species, mainly near benches and rest areas.</b>	2025	Barcelona City Council
7.10. <b>To improve our knowledge of the effects of climate change on natural systems</b> (phenology, allergies, pests, etc.)	2025	Barcelona City Council
7.11. <b>To create ephemeral or seasonal gardens</b> (ten a year, one per district).	2025	Barcelona City Council

## MEDIUM- AND LONG-TERM ACTIONS (2026-2030) THAT NEED PROMOTING:

ACTIONS	DATE	PLAYERS INVOLVED
7.12. <b>To implement the programmes needed to protect the species most vulnerable to climate change.</b>	2030	Barcelona City Council
7.13. <b>To create ten biodiversity shelters as an essential part of urban green infrastructure.</b>	2030	Barcelona City Council
7.14. <b>To re-naturalise the bed of the Llobregat and Besòs rivers and improve the quality of the water there</b> (by reducing uncontrolled spills) and in the aquifers (saline barrier).	2030	AMB, ACA
7.15. <b>To reclaim the Rec Comtal.</b>	2030	Barcelona City Council

## VALUES OF THE CLIMATE EMERGENCY ACTION PLAN

-  SOCIALLY FAIR  
BARCELONA
-  HABITABLE, SAFE  
BARCELONA
-  HEALTHY BARCELONA
-  EFFICIENT,  
RENEWABLE  
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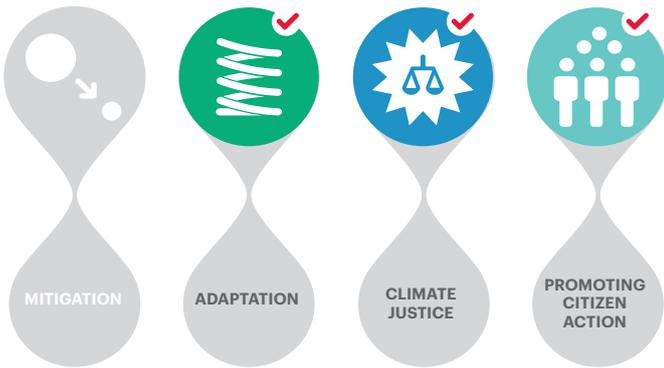
## MUNICIPAL PLAYERS INVOLVED

- Urban Ecology.
- Districts.
- Barcelona Public Health Agency.

## MONITORING INDICATORS

- Total green surface area (differentiate from Collserola) (km<sup>2</sup>).
- Urban green surface area (excluding Collserola) (km<sup>2</sup>).
- Green surface area per inhabitant (m<sup>2</sup>/inhab.)
- Tree cover (%).
- Number of tree species.
- Protected surface area (m<sup>2</sup>).
- Tree species with priority for the Climate Plan (adapted) (%).
- Number of urban allotments (More Sustainable Barcelona Map).
- Number of ephemeral gardens per district.
- Number of mosquito control operations carried out.
- Number of nature reserves.
- Number of tree species.
- Number of naturalized ponds that have been emptied due to drought.
- Unpaved surface in order to recover the organic soil (hectares).

## STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN



Many more green areas

### ASSOCIATED LINES OF ACTION:



Taking care of everyone



No cuts



To guarantee thermal comfort



Better than new buildings



Reclaiming roof terraces



Climate-based urban transformation



Not a single drop wasted



Renewables in public areas



Good mobility



Protecting the coastline and our rivers



Green and circular economy



Responsible consumption



Zero waste



Food sovereignty



Cultural action for the climate



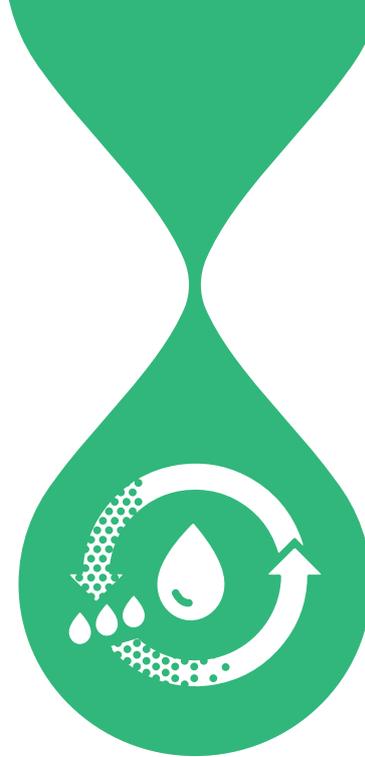
Climate cooperation



Let's get organised

# NOT A SINGLE DROP WASTED

Replacing whenever possible the use of potable water with alternative water resources such as groundwater, rainwater and regenerated water. Facilitating water infiltration into the subsoil.



## JUSTIFICATION AND BENEFITS

Barcelona suffers from recurring episodes of drought that are turning potable water into a very valuable resource and putting our capacity to maintain the city's water supply at risk. Moreover, the city has a very high degree of impermeability (72% of the municipal total).

Various climate projections appear to suggest that climate change could affect the water cycle in the following ways:

- a slight fall in resources, especially towards the end of the century.
- greater variability in the availability of water resources, in periods of drought as well as torrential rain, with the increased risk of saturating the urban drainage systems.
- a slight increase in the demand for water, which could worsen the water supply deficit that currently affects the city.

More specifically, a 12% reduction in surface resources and 9% in underground resources is forecast by 2050, along with a 4% increase in demand for different uses. There is therefore a general need for additional potable water resources in the metropolitan area of 34 hm<sup>3</sup> a year, with Barcelona's need estimated at 18 hm<sup>3</sup> a year.

Following a series of critical situations, a series of measures have been adopted to reduce potable water consumption (currently 107 litres per inhabitant per day for domestic consumption), including awareness campaigns and the construction of a desalination plant.

We also now have the Alternative Water Resources Plan (PLARHAB), which contemplates a series of actions to increase infiltration and expand the use of ground, rain,

regenerated and grey water. Applying the PLARHAB means expanding the groundwater system and increasing the annual volume of the concession in order to take advantage of underground water by 2.7 hm<sup>3</sup> a year, from the current 1.8 hm<sup>3</sup> a year to 4.4 hm<sup>3</sup> a year.

Making the city more permeable enables us to reduce the risk of urban flooding and the impact of overflows on the receiving environment. Achieving that requires integrating water-runoff management into the city's urban model, by means of sustainable urban drainage systems (SUDS), reservoir or green roofs, or increasing the city's permeable green surface area.

Ensuring Barcelona has an optimal and efficient water cycle is one of the challenges facing the city and the metropolitan area, and one which could be posed even more starkly in the future. It is also planned to reduce domestic potable water consumption to 100 litres per inhabitant per day.

Barcelona has 500 km of saturated sewerage network, equivalent to 25% of Barcelona's surface area, and which poses a risk to pedestrian mobility, during ten-year return period rainfall (T10). Making the city more permeable enables us to reduce the risk of urban flooding and the impact of overflows on the receiving environment.

Achieving this requires integrating water-runoff management into the city's urban model, through sustainable urban drainage systems (SUDS), reservoir or green roofs, or by increasing the city's permeable green surface area. Seven master plans have been implemented in Barcelona which have been gradually strengthening and improving the city's drainage and sewerage system, applying innovations and meeting various challenges. The latest was presented in

2020, the Barcelona Comprehensive Drainage Master Plan (PDISBA). This is an urban planning tool aimed at reducing the risks that arise from the drainage

system overflowing, while protecting people, property and the environment and considering the effects of climate change.

## ILLUSTRATIVE ACTION



### Parc de Joan Raventós, a green area that absorbs rainwater

Parc de Joan Raventós is in the Sarrià neighbourhood and has a surface area of 20,000 m<sup>2</sup>. It opened in 2009 following the reclamation of the old Riera de les Monges riverbed. Built with an innovative, sustainable drainage system, it collects rainwater through various kinds of draining surfaces, which filter the water while purifying it, so that it eventually reaches the subsoil. In the event of a downpour, the water is kept in the retention area or anti-flooding areas created for that purpose.

## ACTIONS OF THE PLAN

### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Barcelona Comprehensive Sewer System Plan (2006) and updates planned.
- Programme to Promote the City's Urban Green Infrastructure (2017).
- Tree Master Plan (2017-2037).
- Drought Protocol (2017).
- Technical Plan for Taking Advantage of Alternative Water Resources (2018) and updates.
- Nature Plan Barcelona (2021-2030).

### PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

ACTIONS	DATE	PLAYERS INVOLVED
<b>8.1. To achieve the consumption of 100 l/resid./day domestic potable water</b> by implementing water-saving measures, public campaigns and initiatives at public facilities that consume large amounts of water.	2030	Barcelona City Council

### SHORT-TERM ACTIONS (2018-2025):

ACTIONS	DATE	PLAYERS INVOLVED
<b>8.2. To foster water saving on a municipal level in irrigation, fountains, cleaning and municipal buildings.</b>	Ongoing	Barcelona City Council
<b>8.3. To incorporate up-to-date climate forecasts in future revisions of the Drought Protocol.</b>	2018	Barcelona City Council

ACTIONS	DATE	PLAYERS INVOLVED
8.4. To provide for tree irrigation and increase it where necessary to obtain the desired evapotranspiration and cooling services (optimally by remote control, depending on the water balance).	2020	Barcelona City Council
8.5. To assess and continually monitor the quality of ground water.	2020	Barcelona City Council
8.6. To have a Barcelona city supply plan.	2020	Barcelona City Council
8.7. To increase the sustainable urban drainage systems (SUDS) by 20,000m <sup>2</sup> by 2024.	2024	Barcelona City Council
8.8. To replace 100,000 m <sup>3</sup> /year of potable water with alternative water resources for the municipal uses they are compatible with by 2024.	2024	Barcelona City Council
8.9. Promoting the use of greywater in new housing developments and renovations or for industrial purposes, and studying its inclusion in future versions of the Municipal Urban Environment Byelaw.	2025	Barcelona City Council
8.10. To study the energy impact of supplying water (the desalination plant, regenerated water plants, etc.)	2025	Barcelona City Council
8.11. To study the feasibility of producing regenerated water at the Besòs EDAR for feeding the Besòs aquifer, to maintain the river's ecological flows and feed the purification plant.	2025	Barcelona City Council

## MEDIUM- AND LONG-TERM ACTIONS (2026-2030) THAT NEED PROMOTING:

ACTIONS	DATE	PLAYERS INVOLVED
8.12. To assess and continually monitor the quality of drinking water.	2030	Barcelona City Council
8.13. To permeate (depave) 3 ha and reclaim the organic soil there.	2030	Barcelona City Council
8.14. To use regenerated water from the El Prat Waste Water Purification Plant, with a 5 hm <sup>3</sup> potential, for industrial use in the Zona Franca and compatible residential uses (La Marina neighbourhood) and for recharging the aquifer.	2030	Barcelona City Council AMB, ACA
8.15. To build recharging pools at high points in the city and generate a flow retention and lamination effect, and install systems for capturing rainwater in Collserola so it can be reused. To assess their exploitation cost.	2030	Barcelona City Council
8.16. To use pumped groundwater from underground facilities (the metro, car parks) to infiltrate the aquifer.	2030	Barcelona City Council

## VALUES OF THE CLIMATE EMERGENCY ACTION PLAN



SOCIALLY FAIR  
BARCELONA



HABITABLE, SAFE  
BARCELONA



HEALTHY BARCELONA



EFFICIENT,  
RENEWABLE  
BARCELONA



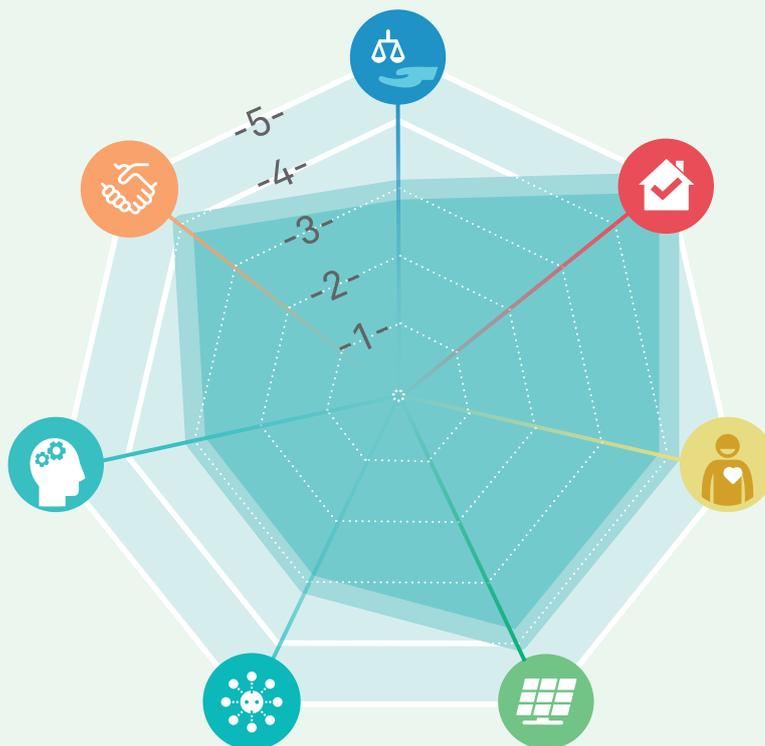
LOW-CARBON,  
DISTRIBUTIVE  
BARCELONA



BARCELONA THAT  
LEARNS



COMMITTED  
BARCELONIANS



## MUNICIPAL PLAYERS INVOLVED

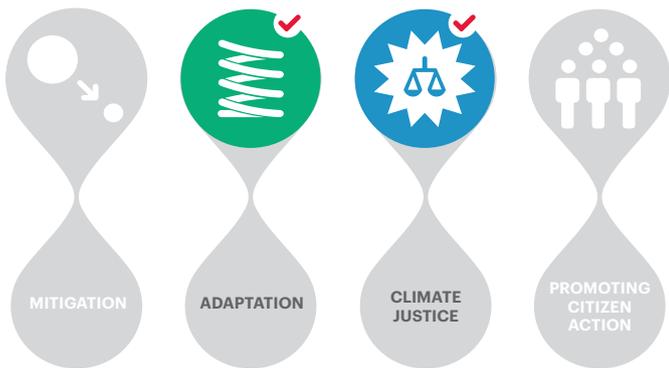
- Urban Ecology (BACSA).
- Districts.
- Barcelona Metropolitan Area.
- Catalan Water Agency.
- Barcelona Public Health Agency.

## MONITORING INDICATORS

- Number of drought alerts and states of pre-alert.
- Water consumption by sector (hm<sup>3</sup> and %).
- Water consumption per inhabitant per day (l/inhabitant/day).
- Sustainability Index (%).
- Water consumption by type and use (hm<sup>3</sup> and %).
- Barcelona City Council water consumption (hm<sup>3</sup>).
- SUDS area (m<sup>2</sup>).
- Regenerated water used (m<sup>3</sup>).
- Greywater used (m<sup>3</sup>).
- Rainwater used on roofs (m<sup>3</sup>).
- Analyses with conductivity values > 2000µS/cm (%) in groundwater wastewater.

- Economic losses (cumulative amount reported to the insurance compensation board as a result of extraordinary events: extraordinary rainfall and sea storms) (millions of Euros).
- Water surface area in ornamental fountains (m<sup>2</sup>).
- Number of public drinking fountains
- Renovated sewer volume (ml).
- Sewer renovation rate (%).
- Average age of the sewer system (years).
- Estimated volume of sewer water filtered into the aquifer (hm<sup>3</sup>).
- Economic losses due to aquifer pollution (€).

# STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN



# RENEWABLES IN PUBLIC AREAS

Incorporating solar-energy facilities in public spaces, through pergolas, party walls and energy-generating surfaces.



## JUSTIFICATION AND BENEFITS

Barcelona is committed to a change of energy model in the short-to-medium term by switching mainly to clean and renewable energy sources. This restructuring has to be linked to a significant change in power generation and consumption patterns by promoting, among other things, the development of systems for generating solar power, the most abundant renewable energy resource we have.

The City Council is therefore pushing for generating systems to be installed in buildings, facilities and public spaces that make use of available, local, waste or renewable resources, principally the sun, to reduce the amount of energy that comes from the grid.

This has included the launch of a solar power generation promotion programme in Barcelona to

boost the installation of solar power systems on buildings and in existing public spaces, whether they are publicly or privately owned, by means of public or private investment.

One example of how to take advantage of public spaces and their structures to generate power is the installation of power-generating pergolas and converting existing pergolas into power generators

There were 15 power-generating pergolas spread across the city in 2016 and the intention is to continue installing them.

## ACTIONS OF THE PLAN

### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Programme to Promote Solar Power Generation in Barcelona (2017-2019) and subsequent editions (2019-2030).

## ILLUSTRATIVE ACTION

### Photovoltaic pergola over a children's play area in Barcelona's Plaça del Centre



When Plaça del Centre, a square in the Les Corts district, was renovated, a pergola was placed over the children's play area which, as well as providing shade, uses solar power to generate electricity.

The pergola is covered with photovoltaic panels with 12.48 kWp of installed power. It is connected to a set of lithium-ion batteries and supplies locally sourced renewable energy to the 25 public lights in the square itself and on the stretch of Avinguda de Madrid that crosses it. In fact it supplies 70% of the square's annual lighting needs. When the energy stored in the batteries proves insufficient, the lights are powered directly from the electricity grid.

## PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

ACTIONS	DATE	PLAYERS INVOLVED
9.1. To speed up the installation of renewable generation in municipal buildings (nursery schools, cultural and sports facilities, etc.) as well as public spaces by incorporating a further 6 MWp of photovoltaic generation in the municipal stock by 2025.	2025	Barcelona City Council

## SHORT-TERM ACTIONS (2018-2025):

ACTIONS	DATE	PLAYERS INVOLVED
9.2. To assess the incorporation of generation in other public space elements, such as pavements, road surfaces, etc.	Ongoing	Barcelona City Council

## MUNICIPAL PLAYERS INVOLVED

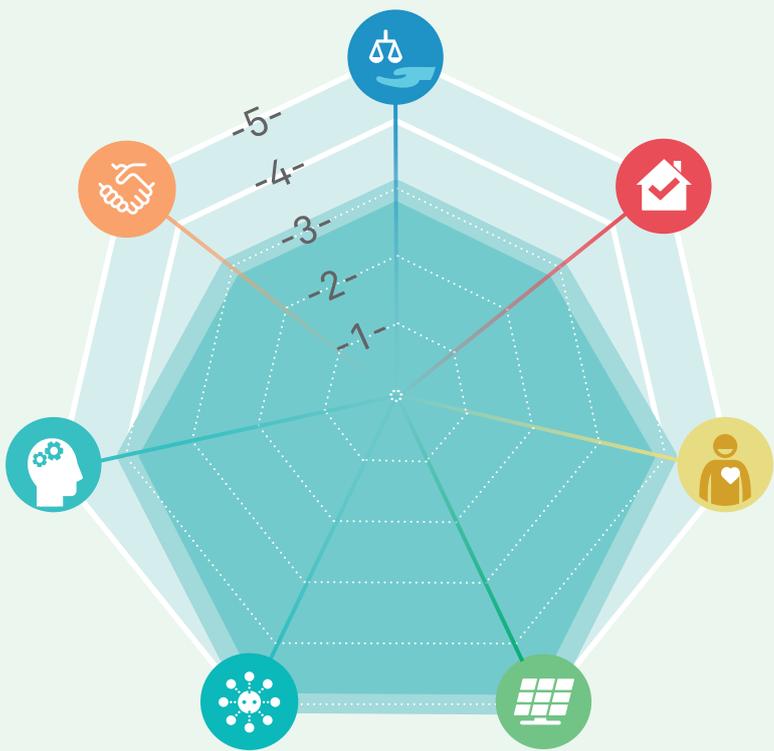
- Urban Ecology.
- Economy, Resources and Economic Promotion.
- 2030 Agenda, Digital Transition and Sports.
- Districts.

## MONITORING INDICATORS

- Installed generating power (kWp).

### VALUES OF THE CLIMATE EMERGENCY ACTION PLAN

-  SOCIALLY FAIR BARCELONA
-  HABITABLE, SAFE BARCELONA
-  HEALTHY BARCELONA
-  EFFICIENT, RENEWABLE BARCELONA
-  LOW-CARBON, DISTRIBUTIVE BARCELONA
-  BARCELONA THAT LEARNS
-  COMMITTED BARCELONIANS



### STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN



 **Renewables in public areas**

**ASSOCIATED LINES OF ACTION:**

 Taking care of everyone

 No cuts

 To guarantee thermal comfort

 Better than new buildings

 Reclaiming roof terraces

 Climate-based urban transformation

 Many more green areas

 Not a single drop wasted

 Good mobility

 Protecting the coastline and our rivers

 Green and circular economy

 Responsible consumption

 Zero waste

 Food sovereignty

 Cultural action for the climate

 Climate cooperation

 Let's get organised

Reducing the use of motorised private vehicles and promoting more sustainable means of mobility, reclaiming more quality safe spaces for pedestrians.



**JUSTIFICATION AND BENEFITS**

Mobility is a key factor in urban development. The public’s everyday life cannot be understood without considering the millions of journeys made on foot, by bike, on public transport and in private vehicles, not to mention commercial vehicles. However, that transport and those vehicles now account for 30% of the city’s greenhouse gas emissions. So this is one of the main sectors where action is required.

Reducing the number of vehicles, while making sure those on the roads are cleaner, and facilitating the switch to more efficient means of transport, by promoting public transport, cycling and going on foot, are two essential lines of action for tackling climate change and improving the city’s environmental quality.

Another priority is promoting a model change by replacing private vehicles with more sustainable forms of mobility for reasons of health. So work is being done to offer other ways of getting round the city, principally public transport but also other shared-vehicle options. The idea is to have a broad range of mobility options in place that meets the needs of every journey and is more efficient.

Removing cars from the streets also means reclaiming public space to bring life back to the streets, create more green spaces, improve rainwater drainage, make more space available to pedestrians and so on.

So we need to rethink how to plan and transform the city in a way that gives more prominence to pedestrians and cyclists, boosts the use of collective public transport by improving existing infrastructures, reduces the use of private vehicles and, in general, ensures that mobility in the city is geared towards improving the quality of life of its citizens. For example, the superbloc programme is an opportunity to remove cars from the city and reclaim space for the general public to use.

Improving mobility also requires coordination with the higher-level authorities to ensure the city’s transport infrastructure plans are implemented and our goals can be achieved.

## ACTIONS OF THE PLAN

### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Urban Mobility Plan (2013-2018) and subsequent updates.
- Bicycle Strategy (2015).
- Barcelona Air Quality Improvement Plan (2015-2018).
- Programme of anti-air pollution measures (2016).
- “Filling the streets with life” by creating Superblocks in Barcelona (2016).
- Developing electric vehicles in Barcelona (2018).

### ILLUSTRATIVE ACTION



### New Bicing service

The launch of the new Bicing service entailed the replacement of practically all the 424 stations and bicycles serving more than a hundred thousand Bicing subscribers.

The new system has been widely accepted and is used even more than the previous system. In addition, new subscribers are being taken on at a good rate since the new system opened.

The new Bicing service’s electric bicycles, which are identifiable by an electric symbol on their basket and back mudguard, can be found in any Bicing station as they use the same type of locking system as push bikes, so all stations are mixed. Availability and location can be consulted through the Bicing website and app, which can filter the stations to show where electrical bicycles are available.

### PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

ACTIONS	DATE	PLAYERS INVOLVED
10.1. To improve the feasibility, competitiveness and capacity of the city’s bus network. Increase the frequency and reduce the journey times of services on the basic local network.	Ongoing	Barcelona City Council AMB
10.2. To study the implementation of supplementary measures for reducing the environmental impact of private motorised transport, for example, parking management, urban transformations, toxicity tolls, etc.	Ongoing	Barcelona City Council
10.3. To make progress in applying formulas that reduce the need for mandatory mobility, by applying work mobility strategies that tend to reduce the need for journeys to/for work (conference calls, teleworking, etc.) and creating sustainable mobility plans.	Ongoing	Barcelona City Council AMB, BCN Provincial Council, Government of Catalonia
10.4. To consolidate the cycling infrastructure and improve the quality, connectivity and safety of the existing network, while prioritising the network’s structural areas. Increase the number of anchoring points and create high-capacity bike parks at strategic points and the main public transport interchanges.	Ongoing	Barcelona City Council AMB

ACTIONS	DATE	PLAYERS INVOLVED
<b>10.5. To step up the scale and pace of the Superblock programme. To transform 15 km of streets into green areas by 2024.</b>	2024	Barcelona City Council
<b>10.6. To improve pavement accessibility and comfort, increase pedestrian zones, improve vertical mobility (escalators and lifts), increase the number of traffic-calmed streets, where maximum priority is given to pedestrians.</b>	2025	Barcelona City Council
<b>10.7. To extend the car-park and regulated-parking strategy to the entire city. To review the criteria applied to all areas of the city, all motor vehicles, including motorbikes and goods transport, and reach an agreement with the AMB and metropolitan city councils on the application of consistent policies.</b>	2025	Barcelona City Council AMB
<b>10.8. To complete the tram network and improve its management.</b>	2025	Barcelona City Council AMB Generalitat de Catalunya
<b>10.9. 10.9.- To calm traffic in the city generally, increase road safety and promote a friendly environment with lower energy consumption and fewer emissions. To give a hierarchical structure to the road network, so that the speed limit for most streets is below 30 km/h.</b>	2025	Barcelona City Council
<b>10.10 To Create park &amp; ride areas in collaboration with other authorities.</b>	2030	Barcelona City Council AMB

## SHORT-TERM ACTIONS (2018-2025):

ACTIONS	DATE	PLAYERS INVOLVED
<b>10.11 To deploy a low emission zone, monitor the stages provided for and apply the necessary adjustments.</b>	Ongoing	Barcelona City Council AMB
<b>10.12 To promote spaces allocated to distributing goods for increasing efficiency and reducing their impact on GHG emissions.</b>	Ongoing	Barcelona City Council
<b>10.13 To substantially increase the range of inter-city buses on offer, with a dedicated inter-city bus-lane infrastructure on the main access roads to the city: B-23, C-31 North and C-33.</b>	Ongoing	AMB, Government of Catalonia and Spanish State
<b>10.14 To improve street-level interchange areas for public transport, intermodal stations and regional and metropolitan bus terminals.</b>	Ongoing	Government of Catalonia and Spanish State
<b>10.15 To provide support at state level for the creation of an ECA area in the Western Mediterranean.</b>	2020	Barcelona City Council
<b>10.16 To provide grants and subsidies for going to work by bike. To promote a pilot test, help businesses to buy bikes and assess the possibility of providing workers with financial compensation for the kilometres they travel by bike to get to work.</b>	2025	Barcelona City Council

ACTIONS	DATE	PLAYERS INVOLVED
<b>10.17 To promote electric vehicles</b> (vans, cars, bicycles, machinery, etc.) <b>with the creation of a new electric-charging infrastructure, with tax allowances for purchasing, recharging and parking, introducing electric distribution and taxi services etc.</b>	2025	Barcelona City Council
<b>10.18 To implement the Barcelona City Council Mobility Plan.</b>	2025	Barcelona City Council
<b>10.19 To introduce green tax-regulation measures to tax the goods-distribution activity of big tech platforms.</b>	2025	Barcelona City Council, ATM, AMB, Government of Catalonia
<b>10.20 To diversify fuels and electric vehicles in captive vehicle fleets.</b>	2025	Barcelona City Council
<b>10.21 To promote a 100% low-emission taxi fleet.</b> In accordance with the measure adopted by the metropolitan area (AMB), no taxi licences will be awarded to diesel vehicles from 2019 on.	2025	Barcelona City Council AMB
<b>10.22 To renovate the bus and coach fleet with less polluting technologies and prioritise zero-emission vehicles. Under the “C40 - Fossil Fuel Free Cities” agreement, only electric buses will be purchased from 2025 on (2025). A fossil fuel free zone also needs to be set up under the C40 commitment.</b>	2025	Barcelona City Council AMB, Government of Catalonia
<b>10.23 To install the necessary infrastructure for electrifying the various wharfs at Barcelona Port, land-based machinery and captive fleets.</b>	2025	Port of Barcelona
<b>10.24 To work for a strongly environmental taxation system for Barcelona Port vessels and the aviation sector.</b>	2025	Port of Barcelona, panish State
<b>10.25 To introduce renewable-generation systems in Barcelona Port</b> (42 MWp in 2030) <b>and at Barcelona Airport, on building roofs and with pergolas in the car parks</b> (40 MWp in 2030).	2025	Port of Barcelona and operators

### ACCIONS QUE CAL IMPULSAR A TERMINI MITJÀ I LLARG (2026-2030):

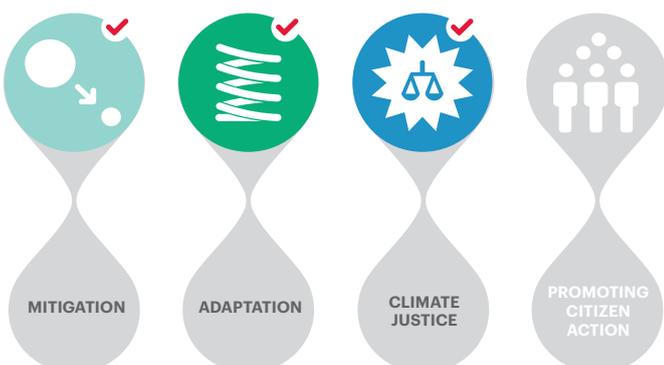
ACTIONS	DATE	PLAYERS INVOLVED
<b>10.26 To electrify and diversify municipal vehicle fleets (including waste-transport vehicles).</b>	2030	Barcelona City Council
<b>10.27 To draw up plans for reducing the emissions from infrastructures and incorporating them into Barcelona Airport’s new master plans, taking into consideration the aviation sector and Barcelona Port.</b>	2030	Barcelona Airport, Spanish State, Port of Barcelona
<b>10.28 To study the elimination of short-distance flights that have an alternative by train (under seven hours) and which are at distances of under 1,000 km, while boosting the high-speed and long-distance rail network and encouraging the creation of night trains, ensuring affordable prices.</b>	2030	Barcelona Airport, AENA. EU

ACTIONS	DATE	PLAYERS INVOLVED
<b>10.29. To continue with the gradual electrification of land fleets and auxiliary units</b> to minimise the consumption of fossil fuels and, at the same time, reduce the impact of local pollution. A process accompanied by contracting 100% renewable energy.	2030	Barcelona Airport
<b>10.30 To encourage the use of rail transport to the airport and fewer car parks. To promote a fleet of electric buses and taxis to provide a service from the airport and to the cruise ship wharf.</b>	2030	Barcelona Airport, Port of Barcelona
<b>10.31 To put into service the Infrastructure Master Plan's metro initiatives</b> that would yield higher profitability more quickly: the central stretch of L9, the L4 link at La Sagrera and the L3 link at Trinitat Vella.	2030	Barcelona City Council Government of Catalonia
<b>10.32 To carry out investments in local and regional commuter services to improve public regional rail transport.</b> Speed up completion of the La Sagrera station.	2030	Government of Catalonia and Spanish State
<b>10.33 To speed up the construction of rail access points to the port, including the Mediterranean corridor, to double the transport of goods by train and reduce lorry traffic.</b>	2030	Barcelona Airport
<b>10.34 To embark on a process of electrifying Barcelona Port</b> (vessels as well as businesses and their activity) <b>accompanied by the procurement of 100% renewable energy.</b>	2030	Spanish State, Port of Barcelona
<b>10.35 To promote Barcelona Port as a base port for cruise ship lines.</b>	2030	Spanish State
<b>10.36 To withdraw the tax exemptions on kerosene in the EU for internal flights in member states and in the common air space.</b>	2030	Port of Barcelona

## MUNICIPAL PLAYERS INVOLVED

- Urban Ecology.
- Districts.
- TMB.

## STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN

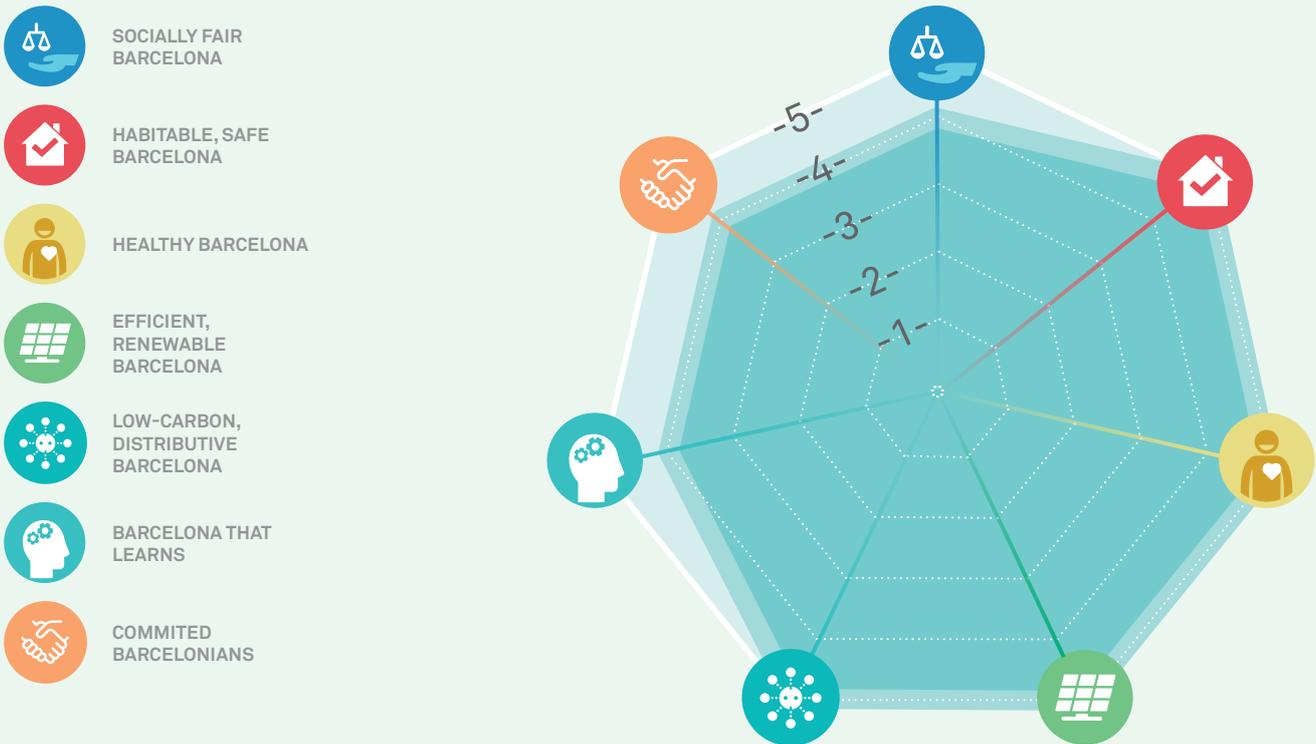


## MONITORING INDICATORS

- Total number of electric vehicle charging points.
- Number of daily journeys in the city.
- Ecomobility in relation to the total number of journeys (%).
- Internal ecomobility (%).
- External ecomobility (%).
- Kilometres of bike lanes installed.
- Number of park & ride zones created.
- Number of superblocks installed.
- Surface area of Superblocks installed (hectares).
- Length of green axes (km).
- Surface area of green squares (hectares).
- Number of green squares.
- NO<sub>x</sub> and PM<sub>10</sub> emissions (µg/m<sup>3</sup>).
- Energy consumption of the municipal vehicle fleet, by type of fuel (kWh/year).
- Number of bicycle-locking places.
- Number of high-capacity parking facilities at strategic points and in major public transport interchanges.

- Streets transformed into green or pacified axes (km).
- Streets with a speed limit below 30 km/h (%).
- Travel by private motor vehicles (%).
- Low-carbon public transport buses, taxis and municipal fleets procured (%).
- Members of the population living under 300 metres from a bike lane (%).

## VALUES OF THE CLIMATE EMERGENCY ACTION PLAN

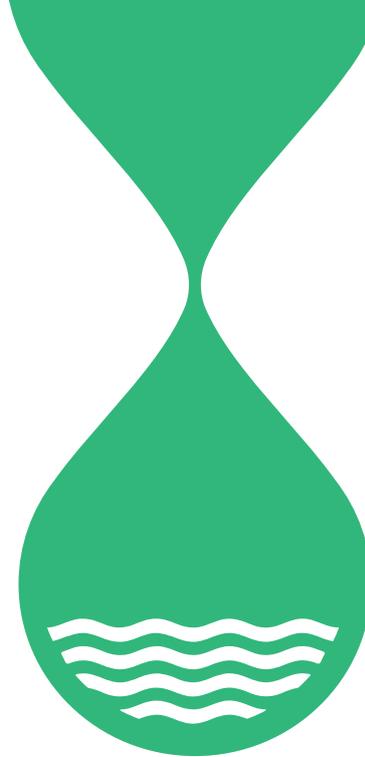


**ASSOCIATED LINES OF ACTION:**

- Good mobility
- Taking care of everyone
- No cuts
- To guarantee thermal comfort
- Better than new buildings
- Reclaiming roof terraces
- Climate-based urban transformation
- Many more green areas
- Not a single drop wasted
- Renewables in public areas
- Protecting the coastline and our rivers
- Green and circular economy
- Responsible consumption
- Zero waste
- Food sovereignty
- Cultural action for the climate
- Climate cooperation
- Let's get organised

# PROTECTING THE COASTLINE AND OUR RIVERS

Conserving and boosting the ecosystem services offered by coastal areas and rivers.



## JUSTIFICATION AND BENEFITS

Barcelona's history has been bound up with the sea since its origins. The coastline has been gradually transformed over the years, and a landscape of lagoons and mud flats has been heavily developed by human hand, predominantly industrial facilities in the 19th century, into the urban seafront we have today.

Opening Barcelona up to the sea has undoubtedly been one of the big challenges and achievements of municipal politics in the last 40 years. As a result of this process, with its beaches and coastal parks, the city now has more than 133 ha of free space, and one of the biggest public spaces in the city. Because, as a look at the old maps shows, those beaches are beyond the "natural" lie of the coastline.

The seas and oceans play a key role in climate change mitigation. More than a quarter of the CO<sub>2</sub> released into the atmosphere is captured and stored at the bottom of our oceans by means of certain physical, chemical and biological processes. However, the increase in emissions and excess of greenhouse gases in the atmosphere could prevent this system from working as it should and, ultimately, reduce its mitigating potential.

On the other hand, the Barcelona shoreline provides some key environmental services: it protects the

infrastructure and neighbourhoods behind the beaches, provides food, is used for leisure and so on. Moreover, there are services that have to be used in tackling the adverse effects that climate change might produce. Then beaches and coastal parks, for example, could be a place to shelter during heat waves, given they have the lowest daytime temperature in the city and there is the sea to cool down in.

But if we are to take advantage of the environmental services the shoreline offers, we need to take care of it. That requires keeping the mass of sea water fit for bathing in and maintaining the marine ecosystems in optimum conditions, because the life cycle of the sea, for example, also helps atmospheric carbon, or blue carbon, capture. Consequently, there is not only a need to adapt the sanitation system, it is also essential to publicise and make people aware of the vulnerability of the marine ecosystem and the action that can be taken to keep it in good condition.

Ensuring the environmental functionality of the city coastline requires making sure the beaches have sediment in sufficient quantity. That means guaranteeing its sedimentary balance by adopting the appropriate measures and increasing its resilience.

## ILLUSTRATIVE ACTION

### The Comprehensive Coastline Management Plan



The Comprehensive Coastline Management Plan (PGIL) is Barcelona City Council's tool for establishing how the city's beaches are to be managed and a joint work framework is to be defined for the players working there.

This plan is covered by Article 6.3 of Act 1/2006, of 13 March, and is based on an agreement between the Catalan regional and Spanish State governments and Barcelona City Council, signed in 2007, that provides a framework for institutional collaboration.

Transferring the sand trapped by the Maresme marina port structures to the beaches to the west complies with the demands of Spain's environment ministry and the Catalan government. Similarly, on the Barcelona coastline and under the PGIL, the sand deposited at the Olympic Port entrance is dredged every year and transferred to the Somorrostro and Barceloneta beaches (currently about 8,000 m<sup>3</sup> a year). It would be necessary to study the feasibility of making the dredging and transfer of sand more effective to see if it would be possible to feed other city beaches, besides increasing the effectiveness of the feeding operation to maximise conservation of the sand transported.

## ACTIONS OF THE PLAN

### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Comprehensive Coastline Management Plan (PGIL) (2007).
- Strategic Plan for the City's Coastal Areas (2018-2025).
- Port Olímpic Master Plan (2018).

### PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

ACTIONS	DATE	PLAYERS INVOLVED
11.1. To define and implement protection strategies and specific uses for each beach.	2030	Barcelona City Council Spanish State

### SHORT-TERM ACTIONS (2018-2025):

ACTIONS	DATE	PLAYERS INVOLVED
11.2. To analyse social perceptions regarding the effects of climate change on the coast (by extending beach-user surveys) with the aim of prioritising and redesigning beach-awareness and communication initiatives.	2025	Barcelona City Council Research centres
11.3. To carry out further studies on vulnerability to erosion and sea flooding.	2025	Barcelona City Council Research centres

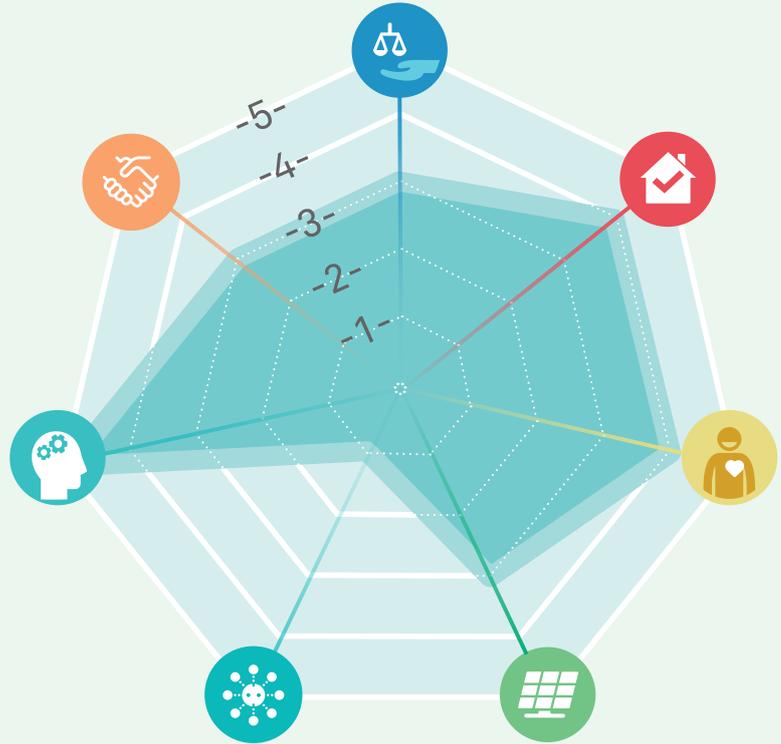
ACTIONS	DATE	PLAYERS INVOLVED
<b>11.4. To establish sediment conservation measures:</b> beach regeneration, change of grain size of the sediment brought in, analysis of other coast-protection options.	2025	Barcelona City Council Spanish State
<b>11.5. To redefine existing coastal uses</b> for their adaptation to future uses and beach availability, and to introduce sustainability criteria into every activity carried out there.	2025	Barcelona City Council
<b>11.6. To promote a sustainable use of the sea,</b> foster environmentally friendly marine activities, through the coastal sea schools, and publicise Barcelona's reef park, etc.	2025	Barcelona City Council

## MEDIUM- AND LONG-TERM ACTIONS (2026-2030) THAT NEED PROMOTING:

ACTIONS	DATE	PLAYERS INVOLVED
<b>11.7. To naturalise the Barcelona coast</b> with the aim of enabling land spaces to become a green corridor and the coastal sea to improve its physical, chemical and biological quality and its biodiversity.	2030	Barcelona City Council
<b>11.8. To give the public access to knowledge of the sea,</b> promote its heritage value and scientific outreach (the CSIC's public area of experimental research, the Beach Centre's educational programme, etc.)	2030	Barcelona City Council
<b>11.9. To apply adaptation and increased resilience measures that are appropriate for the Barcelona coast (2030).</b>	2030	Barcelona City Council AMB
<b>11.10. To increase litoral biodiversity</b> by installing artificial reefs.	2030	Barcelona airport
<b>11.11. To study the effects of climate change on the sea temperature</b> and their implications for water quality, marine biodiversity, fishing and so on.	2030	Barcelona City Council Research centres
<b>11.12. To carry out the first stage of urgent actions under the PDISBA, which focuses on the ecological defence and protection of water bodies that affect and are affected by the urban environment against the effects of climate change on the precipitation model.</b>	2030	Barcelona City Council
<b>11.13. To foster the protection and expansion of the current marine carbon sinks</b> (mainly the Garraf and Maresme meadow woods) between the towns on the Barcelona coast, and encourage collaborative networking.	2030	Barcelona City Council
<b>11.14. To re-plan the model for coastal area uses</b> aligned with a policy for the continuous improvement policy of environmental practices and preventing coastal pollution, with the final goal of maintaining the quality, biodiversity, productivity and dynamism of our sea.	2030	Barcelona City Council

## VALUES OF THE CLIMATE EMERGENCY ACTION PLAN

-  SOCIALLY FAIR BARCELONA
-  HABITABLE, SAFE BARCELONA
-  HEALTHY BARCELONA
-  EFFICIENT, RENEWABLE BARCELONA
-  LOW-CARBON, DISTRIBUTIVE BARCELONA
-  BARCELONA THAT LEARNS
-  COMMITTED BARCELONIANS



## MUNICIPAL PLAYERS INVOLVED

- Municipal Manager’s Office.
- Urban Ecology.
- Districts.

## MONITORING INDICATORS

- Number of beaches with a critical width of under 20 metres.
- Changes to the total surface area of the city’s beaches (m<sup>2</sup>/linear metre).
- Total capacity of beaches (number of users).
- Quality indices for coastal water, river water and biodiversity (%).
- Number of people attending popular-science and citizen-science centres promoting knowledge of the sea.
- Forecast of the time when the water of Barcelona’s beaches will not comply with microbiological quality requirements during the bathing season (%).
- Beach overflow volume (m<sup>3</sup>).
- Volume (m<sup>3</sup>/days of significant rainfall per year) of solid waste from the combined sewer system prevented from reaching the sea during rainy weather.
- Combined System Overflows (CSOs) / rainy days  $\geq$  1mm (%).

## STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN





Protecting the coastline and our rivers

## ASSOCIATED LINES OF ACTION:



Taking care of everyone



No cuts



To guarantee thermal comfort



Better than new buildings



Reclaiming roof terraces



Climate-based urban transformation



Many more green areas



Not a single drop wasted



Renewables in public areas



Good mobility



Green and circular economy



Responsible consumption



Zero waste



Food sovereignty



Cultural action for the climate



Climate cooperation



Let's get organised





# ECONOMY AND CONSUMPTION

The Climate Emergency Action Plan asserts the need to rethink the current economic model, decarbonise the economy and modify consumption patterns. We have to promote an economy that closes cycles, fosters the efficient use of resources, responsible consumption, waste prevention and its subsequent recycling and reuse, and which leads to food sovereignty.

This results in processes and products that emit fewer greenhouse gases, and citizens who adapt their consumption habits to fit a more conscious and responsible model. Boosting local

business innovation and competitiveness is key to creating employment, especially for the most vulnerable population. At the same time, we need to move towards a model that fosters the social and solidarity economy, prioritises satisfying people's needs over profit, based on fairness, solidarity, sustainability, participation, inclusion and community commitment, values which also drive social change.

What this means is a radical transition to a new social and economic model that has to be determined and fair, and which we need to accelerate.



## GOALS AND TARGETS FOR 2030:

-  Obtain 100% clean funding
-  Pursue the zero waste strategy.
  - Achieve 1.2 kg waste/inhab/day.
  - Achieve 65 % selective collection (of all waste generated) and quality organic waste collection, with a maximum of 8% foreign matter in weight.
  - >130,000 t of CO2 saved per year.
  - >4,500 jobs with full roll-out of the Zero Waste strategy.
-  Reach 10% of GDP generated by the social and solidarity economy
-  100% of the population subject to the individualised waste collection system.
-  Triple the fresh vegetables consumed in the city that come from Barcelona province.
-  1 farmers' market per district.
-  Presence of local produce in all municipal markets.
-  0 single-use, non-compostable tableware at public events and in public buildings.
-  Incorporate social and environmental criteria in 80% of public procurement..
-  100% of municipal canteens serving low-carbon food (2021).

LINE OF ACTION

# 12

# GREEN AND CIRCULAR ECONOMY

Promoting a fairer and more sustainable economic model that reduces inequalities, creates quality employment and incorporates environmental criteria in taxation.



## JUSTIFICATION AND BENEFITS

Barcelona aspires to be a city that uses its own resources effectively and one which substantially reduces its impact on other areas, to enable local developments with the capacity for boosting employment, strengthening social cohesion and improving everyone's quality of life.

Boosting the circular economy helps the transition to a more efficient use of resources and low emissions, which should allow us to fight against climate change and the impact it has. Boosting local business innovation and competitiveness is key to creating employment, especially for the most vulnerable population, and strengthening the social and solidarity economy at the same time.

## ILLUSTRATIVE ACTION

**New municipal policy of relationship with financial institutions, with the incorporation of social and environmental criteria and clauses.**



The City Council, in its public leadership role, intends to foster a more plural economy and incorporate new financial entities, new banking services and new financing offers that include social and environmental values into municipal management. Traditional banking covered approximately 92% of municipal financing needs until 2016.

The influence of traditional banking fell from 74.9% to 43.1% between 2014 and 2018 owing to the entry of new funding sources for renewing operations such as sustainability bond issues (4.2%) and ethical banking (4.2%) and public banking resources (48.5%).

This means opening up to banking institutions that are committed to the Emergency Climate Action Plan's main principles.

## ACTIONS OF THE PLAN

### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Plan for Promoting the Social and Solidarity Economy (2016-2019) and subsequent updates.

### PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

ACTIONS	DATE	PLAYERS INVOLVED
12.1. To review dealings with financial institutions to incorporate and promote ethical banking and cooperative-, social- and solidarity-economy entities (ECSS).	Ongoing	Barcelona City Council
12.2. To define a green-, blue- and circular-economy strategy. To promote clusters of companies from the city's renewable-energy and circular-economy sector, such as the Besòs area.	2025	Barcelona City Council

### SHORT-TERM ACTIONS (2018-2025):

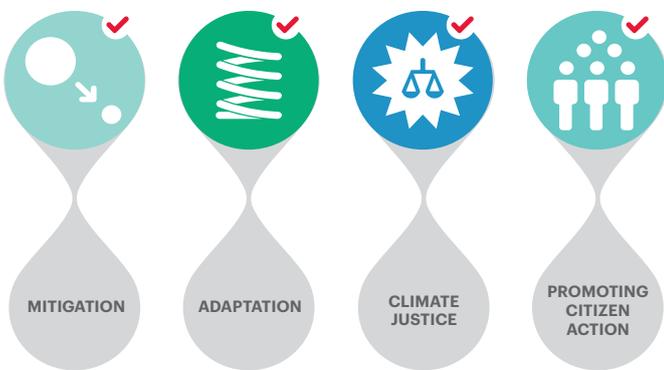
ACTIONS	DATE	PLAYERS INVOLVED
12.3. To promote the consumption of waste valorisation products and supplies.	Ongoing	Barcelona City Council
12.4. To set up programmes for training and employment in the circular economy, through Barcelona Activa.	2020	Barcelona City Council
12.5. To call for the implementation of the Climate Change Act, including tax measures (tax on Co2-e, climate fund, etc.)	2020	Government of Catalonia
12.6. To adapt Barcelona Activa so that it promotes green and local economies.	2020	Barcelona City Council
12.7. Establish a surcharge on the tax on stays in tourist accommodation.	2025	Government of Catalonia
12.8. To draw up a set of guidelines for decarbonisation public procurement with circular-economy and social- and solidarity-economy criteria. To introduce sustainability certification from the City Council's 2030 Agenda.	2025	Barcelona City Council
12.9. To call for the completion and implementation of the Catalan Social and Solidarity Economy Act, along with the resources required for its implementation.	2025	Government of Catalonia
12.10. To promote voluntary agreements by big companies to reduce greenhouse gas emissions.	2025	Government of Catalonia
12.11. To promote a framework and legal instruments for increasing social and sustainable public procurement in Catalonia and Spain.	2025	Barcelona City Council
12.12. To launch a compensation mechanism for the emissions generated by major public works in the city, in favour of actions for combating climate change.	2025	Barcelona City Council

ACCIONS	DATA	AGENTS
12.13. To reform Spanish regulations and thereby enable the creation of new municipal taxes in the area of tourism.	2025	Spanish State
12.14. To advise companies on reducing waste and emissions, both at the planning stage and when implementing improvements (2030).	2025	Barcelona City Council
12.15. To study the options for improving environmental taxation for “low-carbon” companies (2030).	2025	Barcelona City Council

## MUNICIPAL PLAYERS INVOLVED

- Urban Ecology.
- Social Rights, Global Justice, Feminism and LGBTI Affairs.
- Districts.
- Commissioner for Cooperative, Social and Solidarity Economy
- Economy, Resources and Economic Promotion.

## STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN

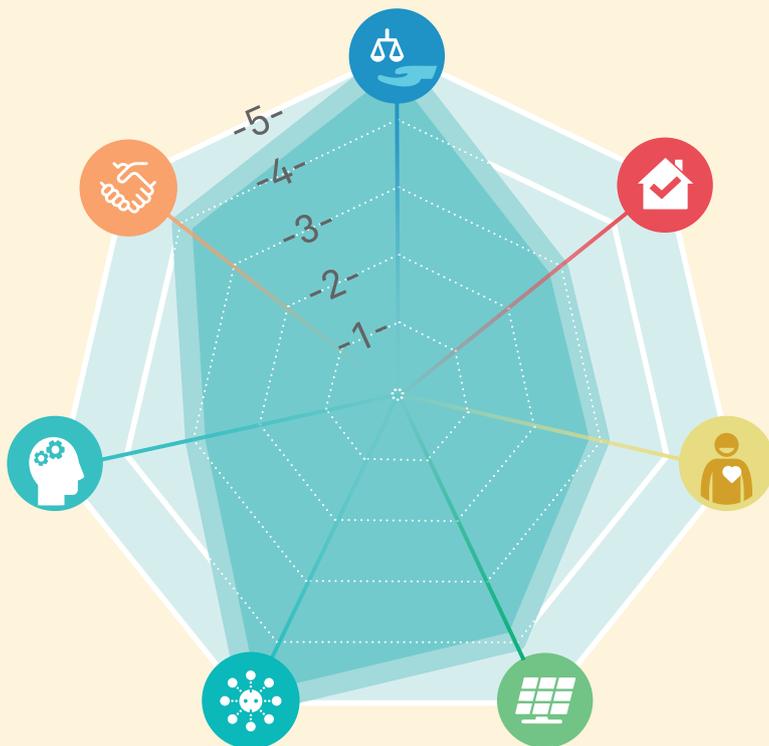


## MONITORING INDICATORS

- Number of jobs created.
- Number of employed persons, salaried and freelancers, and the number of companies linked to the green, social and circular economy.
- Economy devoted to repairing, upcycling or recycling with added value and to exchanging products (%).
- Number of low-carbon contracts.
- Net funding (%).
- GDP generated by the Social and Solidarity Economy (%).
- Public procurement with social and environmental criteria (%).

### VALUES OF THE CLIMATE EMERGENCY ACTION PLAN

-  SOCIALLY FAIR BARCELONA
-  HABITABLE, SAFE BARCELONA
-  HEALTHY BARCELONA
-  EFFICIENT, RENEWABLE BARCELONA
-  LOW-CARBON, DISTRIBUTIVE BARCELONA
-  BARCELONA THAT LEARNS
-  COMMITTED BARCELONIANS



Green and circular economy

#### ASSOCIATED LINES OF ACTION:



Taking care of everyone



No cuts



To guarantee thermal comfort



Better than new buildings



Reclaiming roof terraces



Climate-based urban transformation



Many more green areas



Not a single drop wasted



Renewables in public areas



Good mobility



Protecting the coastline and our rivers



Responsible consumption



Zero waste



Food sovereignty



Cultural action for the climate



Climate cooperation



Let's get organised

# RESPONSIBLE CONSUMPTION

To promote conscious consumption by providing access to sustainable and fair-trade products and services.



### JUSTIFICATION AND BENEFITS

Consumption affects and determines many essential aspects of life (food, housing, clothes, basic utility supplies, leisure, transport, etc.), so the production and consumption model has profound social, economic, environmental and ethical implications for the city itself as well as beyond its boundaries, since services and products are often made in other places. Consumption therefore has a direct effect on GHG emissions because, for example, it is not the same buying local food products as those produced thousands of kilometres away, or replacing an old domestic electrical appliance with a new and efficient one, etc.

Promoting responsible consumption, in a holistic, collectively responsible way as well as habits and lifestyles directed towards the supply and demand of sustainable, socially fair products and services and tending towards a model that fosters the social and solidarity economy (which prioritises satisfying people's needs over profit, based on fairness, solidarity, sustainability, participation, inclusion and community commitment, values that also promote social change), are key to minimising the environmental and social impact of our society.

We also need to promote work-life balance policies that enable conscious household management, responsible consumption and waste-prevention.

Public awareness of responsible consumption in Barcelona is on the increase but we need to define strategies and adopt measures that facilitate access to those products, habits and lifestyles, as well as take action that helps the economic agents in the transition to responsible consumption, with a more sustainable market that is also accessible and affordable for the most vulnerable population.

And provide sufficient time to enable this consumption model to be carried out by city residents through policies that encourage a balanced family and work life, for example. Without time available for conscious household management, responsible consumption, waste prevention, capacity for repair and even recycling will be difficult to carry out. Spaces, time and lifestyles need to be generated to enable a slower, more thought-out, conscious and fair way of living in the city.

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### ACTIONS OF THE PLAN

#### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Barcelona Municipal Waste Prevention Plan (2012-2020).
- Barcelona Zero Waste Strategy (2016-2020).
- Strategy for Promoting Responsible Consumption (2016-2019) and subsequent updates.
- Plan for Promoting the Social and Solidarity Economy (2016-2019) and subsequent updates.
- Food Policy Promotion Strategy (2016-2019) and subsequent updates.

## ILLUSTRATIVE ACTION



**The Responsible Consumption, Social and Solidarity Economy Fair offers an alternative with local, sustainable, socially just products for Christmas.**

In 2016, Barcelona City Council began organising a Christmas fair on the busiest shopping days of the festive season. The fair invites social and solidarity economy organisations and companies to exhibit, sell and advertise their products and services in order to involve the general public in responsible consumption and buying local produce. Around 60 projects and entities take part, offering a wide range of products and services spanning, among others, food, clothes, knowledge and culture, communication, ethical financing, care and health.

Apart from these ideas for responsible consumption, there are cultural activities to attract the general public to a market whose main aim is not to make a profit but to improve the quality of life of as many people as possible. Another aim of this alternative fair is to avoid the compulsive, unthinking consumption typical of Christmas time.

## PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

ACTIONS	DATE	PLAYERS INVOLVED
<b>13.1. Promote responsible consumption through exchange markets,</b> with local products, shops and organisations that reuse and distribute second-hand products, shops that sell in bulk, responsible consumption fairs, etc. To encourage green-energy procurement.	2025	Barcelona City Council

## SHORT-TERM ACTIONS (2018-2025):

ACTIONS	DATE	PLAYERS INVOLVED
<b>13.2. To consolidate the Social and Solidarity Economy Fair and the Responsible Consumption Christmas Fair</b> as meeting points and places for promoting economic initiatives that promote social and environmental justice.	Ongoing	Barcelona City Council
<b>13.3. To expand and strengthen the Network of Municipalities for the Social and Solidarity Economy,</b> which promotes new democratic, solidarity and sustainable ways of producing and consuming, with the aim of moving towards an economic model that is more resistant to the effects of major economic crises.	Ongoing	Barcelona City Council AMB
<b>13.4. To boost the promotion of citizen and social projects and initiatives and provide continuity to the specific line of responsible-consumption subsidies.</b>	Ongoing	Barcelona City Council
<b>13.5. To create a new benchmark space (Espai Consum) in the city that promotes responsible consumption,</b> offers information and specific resources for facilitating responsible consumption and acts as a meeting point for consumption-related players.	2018	Barcelona City Council

ACTIONS	DATE	PLAYERS INVOLVED
<b>13.6. To promote a new way to be more socially and environmentally friendly, with the creation of the FAR [lighthouse] for social and economic innovation,</b> a facility for promoting the social and solidarity economy (SSE ) and SSE advice points in districts, with extended training offers and the creation of a line of funding for business projects under agreements with ethical banks, among other things.	2018	Barcelona City Council
<b>13.7. To imbue the Municipal Consumer Information Office (OMIC) with a responsible-consumption perspective</b> and extend its information and advice resources to include specific issues arising from a new way of doing things, such as the platform economy and the collaborative economy.	2020	Barcelona City Council
<b>13.8. To identify and highlight local authority strategies and good practices for the Authority's responsible consumption</b> and thereby boost its exemplary role in public policies.	2020	Barcelona City Council
<b>13.9. To provide specific internal training on responsible consumption</b> within the City Council.	2020	Barcelona City Council
<b>13.10. To apply and promote the use of social and environmental purchasing criteria in public purchasing and procurement.</b>	2025	Barcelona City Council
<b>13.11. To introduce climate emergency criteria in terms and conditions for advertising goods and services in spaces under public control.</b>	2025	Barcelona City Council

## MEDIUM- AND LONG-TERM ACTIONS (2026-2030) THAT NEED PROMOTING:

ACTIONS	DATE	PLAYERS INVOLVED
<b>13.12. To study the carbon footprint of the various types of consumption and production in Barcelona,</b> taking into account the introduction of global-load emission indicators.	2030	Barcelona City Council

### MUNICIPAL PLAYERS INVOLVED

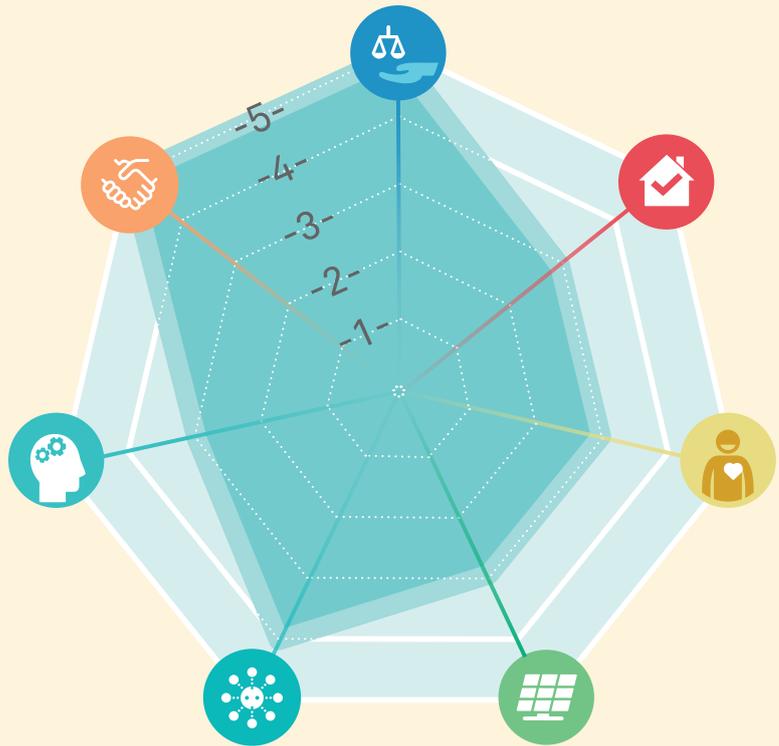
- Urban Ecology.
- Social Rights, Global Justice, Feminism and LGBTI Affairs.
- Districts.
- Economy, Resources and Economic Promotion.
- 2030 Agenda, Digital Transition and Sports.

### MONITORING INDICATORS

- Number of ESS advice centre, Espai Consum and Innoba facility users.
- Number of greened city events.
- Number of users and economic activity at the Christmas Responsible Consumption Fair.
- Responsible consumption grants and subsidies awarded.
- Number of users informed by awareness-raising campaigns.

## VALUES OF THE CLIMATE EMERGENCY ACTION PLAN

-  SOCIALLY FAIR BARCELONA
-  HABITABLE, SAFE BARCELONA
-  HEALTHY BARCELONA
-  EFFICIENT, RENEWABLE BARCELONA
-  LOW-CARBON, DISTRIBUTIVE BARCELONA
-  BARCELONA THAT LEARNS
-  COMMITTED BARCELONIANS



## STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN



 **Responsible consumption**

### ASSOCIATED LINES OF ACTION:

-  Taking care of everyone
-  No cuts
-  To guarantee thermal comfort
-  Better than new buildings
-  Reclaiming roof terraces
-  Climate-based urban transformation
-  Many more green areas
-  Not a single drop wasted
-  Renewables in public areas
-  Good mobility
-  Protecting the coastline and our rivers
-  Green and circular economy
-  Zero waste
-  Food sovereignty
-  Cultural action for the climate
-  Climate cooperation
-  Let's get organised

LINE OF ACTION

14

# ZERO WASTE

Reducing the generation of waste (especially single-use plastics); promoting re-use and improving selective waste collection.



## JUSTIFICATION AND BENEFITS

The best waste is waste that is not created.

At present, waste treatment and management account for approximately 10% of computable greenhouse gas emissions in the city. Reducing waste, separating it out and managing it correctly is therefore key in reducing its impact.

Prioritising measures for prevention, reduction, repair and reuse is the first step in seeking to achieve zero waste. Correct management of waste generated and its possible reuse are end strategies which, while necessary, consume energy and generate emissions. Therefore, the less waste, the better.

## ACTIONS OF THE PLAN

### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Barcelona Municipal Waste Prevention Plan (2012-2020).
- Barcelona Zero Waste Strategy (2016-2020).
- Strategy for Promoting Responsible Consumption (2016-2019) and subsequent updates.
- Plan for Promoting the Social and Solidarity Economy (2016-2019) and subsequent updates.
- Food Policy Promotion Strategy (2016-2019) and subsequent updates.

## ILLUSTRATIVE ACTION

### Repair workshops

Barcelona City Council has a repair workshop programme for civic and neighbourhood centres, that is designed to provide people with the knowledge they need to repair their own electronic devices and small household electrical appliances.

The Plan's main aims are to:

- **Promote waste prevention.**
- **Preserve raw materials** and avoid exhausting their supply on making new appliances.
- **Avoid generating new waste** and, therefore, the economic and environmental costs associated with its subsequent treatment.
- **Give people the tools** for lengthening the useful life of appliances.



**PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:**

ACTIONS	DATE	PLAYERS INVOLVED
<b>14.1. To implement a zero-waste strategy</b> by greening festivals and events, reusable cups/glasses, cutlery and plates, repair workshops and spaces, exchange forums, a library of things, repair spaces, low-waste fairs and conferences, etc.	2025	Barcelona City Council
<b>14.2. To implement individualised collection systems for domestic and commercial waste throughout the city, increasing selective collection up to 65%, to reduce the need for incineration.</b>	2030	Barcelona City Council Government of Catalonia, Spanish State
<b>14.3. To promote fab labs 2.0.</b>	2030	Barcelona City Council
<b>14.4. To eliminate single-use plastics.</b>	2030	Barcelona City Council Government of Catalonia, Spanish State

**SHORT-TERM ACTIONS (2018-2025):**

ACTIONS	DATE	PLAYERS INVOLVED
<b>14.5. To apply regulatory changes that enable the implementation of new Collective Extended Producer Responsibility Systems (SCRAP) and promote the introduction of Deposit, Return and Refund Systems (SDDR).</b>	Ongoing.	Government of Catalonia, Spanish State
<b>14.6. To optimise transport routes</b> to reduce journeys and improve the <b>waste collection service.</b>	2025	Barcelona City Council
<b>14.7. To reach voluntary agreements with the private sector</b> to establish best practices in reducing packaging, waste, single-use plastics, etc.	2025	Barcelona City Council AMB
<b>14.8. To create a domestic waste collection tax that incentivises participation in selective waste collection.</b>	2025	Barcelona City Council

**MUNICIPAL PLAYERS INVOLVED**

- Urban Ecology.
- Districts.
- Economy, Resources and Economic Promotion.
- 2030 Agenda, Digital Transition and Sports.

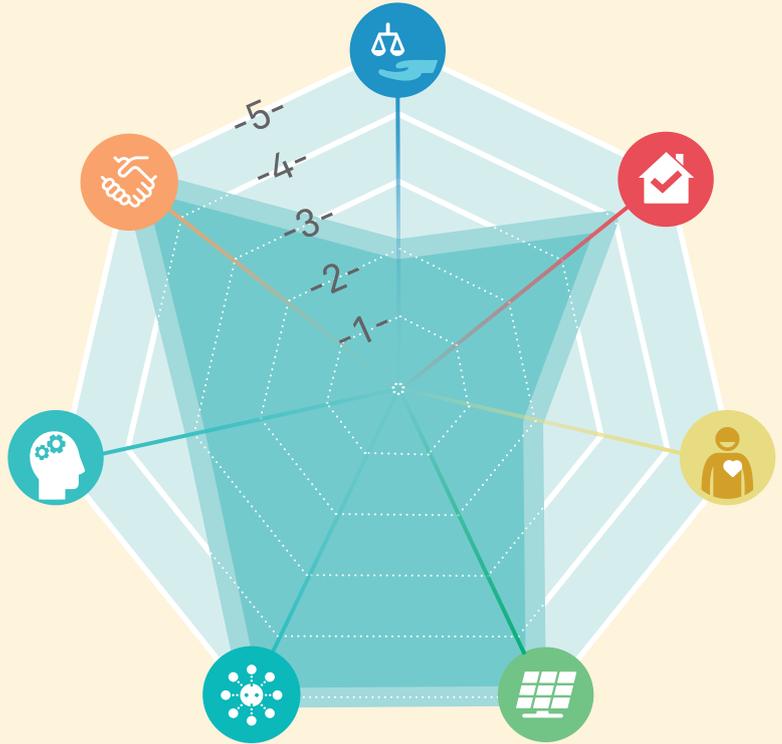
**MONITORING INDICATORS**

- Waste avoided (kg).
- Selective waste collection (%).
- Percentage of the population covered by individualised collection systems (%).

- Total waste generated (tonnes).
- Total waste generated per inhabitant per day (kg/inhab./day).
- Number of single-use, non-compostable items of tableware used at public events and in municipal buildings.
- Emissions saved per year through the reduction of waste (within the framework of the Zero Waste strategy) (tonnes of CO<sub>2</sub>).
- Number of jobs created by the full roll-out of the Zero Waste strategy.

## VALUES OF THE CLIMATE EMERGENCY ACTION PLAN

-  SOCIALLY FAIR BARCELONA
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-  HEALTHY BARCELONA
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-  BARCELONA THAT LEARNS
-  COMMITTED BARCELONIANS



## STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN



### ASSOCIATED LINES OF ACTION:

-  Zero waste
-  Taking care of everyone
-  No cuts
-  To guarantee thermal comfort
-  Better than new buildings
-  Reclaiming roof terraces
-  Climate-based urban transformation
-  Many more green areas
-  Not a single drop wasted
-  Renewables in public areas
-  Good mobility
-  Protecting the coastline and our rivers
-  Green and circular economy
-  Responsible consumption
-  Food sovereignty
-  Cultural action for the climate
-  Climate cooperation
-  Let's get organised

# FOOD SOVEREIGNTY

To promote consumption of local, ecological and healthy products.

### JUSTIFICATION AND BENEFITS

The current agro-food model (industrialised agriculture, involving large amounts of resources and transport, diets that are not really sustainable, etc.) is responsible for a quarter to a third of global GHG emissions. Taking into account the total impact, it is calculated that, for every euro we spend as consumers on an agricultural product, the population as a whole pays two more linked to environmental damage and on people's health.

Switching to a food model with short circuits and local products, ecological and seasonal practices, and less animal protein, means taking the road towards food sovereignty, a territorial model involving more equality between the various agents, job creation, better health and a reduction in greenhouse gas emissions, because there is less need for transport, lower quantities of resources, and less dependence on external resources.

Foodstuffs are a vital product but Barcelona is a consumer, not a producer. Access to local or ecological products is still difficult in a dense urban environment such as Barcelona, but ecological consumption groups and cooperatives, the existing supply of local produce in municipal and farmers' markets, and the presence of shops selling ecological products, are improving access to those types of foods that are healthier and more sustainable, while providing an outlet for the agro-ecological producers near the city and, therefore, a local economy.

However, this market is still insufficient and only within the reach of part of the population. Promoting these kinds of products, practices, short circuits and entities should enable their use to become more widespread, flexible and accessible to everyone, because their benefits have to be capable of reaching as many people as possible and also because increased demand would allow supply to stabilise and diversify.

Barcelona has been a signatory of the Milan Pact since 2015, an international agreement promoted by the FAO (UN's Food and Agriculture Organization) and where the two hundred participating cities undertake to develop sustainable, fair and healthy agri-food models.

Barcelona will be the host city for the Milan Pact's international summit, becoming the World Capital of Sustainable Food for 2021, an enormous opportunity for launching and raising the profile of food sovereignty-related initiatives. Barcelona's bid is based on three cornerstones: promoting healthy diets, especially for children; proposing sustainable food as an economic opportunity for small commerce and highlighting their perspective as a strategy for combating climate change.



## ACTIONS OF THE PLAN

### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Barcelona Municipal Waste Prevention Plan (2012-2020).
- Barcelona Zero Waste Strategy (2016-2020).
- Strategy for Promoting Responsible Consumption (2016-2019) and subsequent updates.
- Plan for Promoting the Social and Solidarity Economy (2016-2019) and subsequent updates.
- Food Policy Promotion Strategy (2016-2019) and subsequent updates.

### ILLUSTRATIVE ACTION



#### Access to a balanced Mediterranean diet in schools provides a great opportunity to promote healthier food habits.

All municipal nursery schools have their own kitchen where they prepare the menus every day. This facilitates the use of fresh, ecological produce.

In fact, the food served in school dining rooms comes from ecological agriculture. For example, all the dairy produce supplied (milk, yoghurt and cheese) are ecological, as is the most popular fruit (apples, pears, oranges and bananas) and the fruit juices, bread, rice, potatoes, pasta and pulses. The vegetables are ecological during the months when it is seasonally possible to get hold of them (e.g. lettuce, onions, carrots and pumpkins throughout the school year, and tomatoes, leeks, green beans and broccoli when they are in season).

When it comes to animal proteins, chicken is ecological throughout the year. The fish children get is hake, cod, monkfish and sole. At nursery school they do not eat pork or pork products, nor perch or halibut. And every meal is accompanied by salad. This commitment to an ecological diet with a strong presence of raw food, greens and vegetable protein not only enables many children to have access to quality food on a fair basis but also allows families, by having a monthly school menu, to incorporate some of these habits into their daily diet.

### PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

ACTIONS	DATE	PLAYERS INVOLVED
<b>15.1. To implement and promote healthier, low-carbon diets in 2021, in schools and all municipal dining rooms:</b> seasonal, ecological, local produce, reducing the consumption of animal protein (especially red meat) and highly processed foods	2020	Barcelona City Council
<b>15.2. To support and promote urban and peri-urban agriculture,</b> as well as the city's agro-ecological sector and the Parc Agrari del Llobregat.	2025	Barcelona City Council AMB
<b>15.3. To create an identification system as well as logistics and commercial facilitation tools,</b> together with Mercabarna, municipal markets, traders associations, agricultural organisation, etc., to significantly increase the presence of short-circuit, sustainable, ecological, local fruit and vegetables in the city's local commerce.	2025	Barcelona City Council Mercabarna and Municipal Markets

**SHORT-TERM ACTIONS (2018-2025):**

ACTIONS	DATE	PLAYERS INVOLVED
<b>15.4. To promote and boost training and activities aimed at providing knowledge on vegetarianism in different areas.</b>	2020	Barcelona City Council
<b>15.5. To create and promote farmer's markets</b> , with Barcelona's local producers.	2025	Barcelona City Council
<b>15.6. To promote and define the healthy and sustainable dining-room model.</b> This is a place for boosting and activating agricultural production. For example: ensure the vegetables, fruit or veal consumed comes from extensive, ecological, local production sources.	2025	Government of Catalonia
<b>15.7. To promote the use of ecological and local food in the restaurant and catering sector.</b>	2025	Barcelona City Council
<b>15.8. To support the appearance of cooperative consumer initiatives</b> with higher scalability and other projects that boost the supply of responsible consumption products and services in the city (preferably SSE services).	2025	Barcelona City Council
<b>15.9. To open a wholesale market for fresh organic food in 2021 at Mercabarna</b> to promote the sale of organic production and to encourage the participation of local organic producers.	2025	Barcelona City Council Mercabarna and Municipal Markets
<b>15.10. To open a food-reuse centre</b> (2,500 Tm/year) at Mercabarna in 2021.	2025	Barcelona City Council AMB
<b>15.11. To boost the marketing of local, organic seasonal vegetables at Mercabarna</b> , especially those produced in abundance in Catalonia (tomatoes, dried onions, lettuce and green beans).	2025	Mercabarna
<b>15.12. To organise the 2021 Milan Pact's meeting of mayors</b> (from 200 cities) for promoting the cities' commitment to healthy food and combating climate change. To make Barcelona the Capital of Sustainable Food in 2021 and press for a change in the food model, locally and internationally.	2025	Barcelona City Council
<b>15.13. To consolidate the green markets project and create new farmers' markets</b> fairly distributed around the city.	2025	Barcelona City Council
<b>15.14. To promote local commerce in the food sector.</b>	2025	Barcelona City Council
<b>15.15. To study the regulation of establishments selling highly processed and high-protein fast food near schools.</b>	2025	Barcelona City Council
<b>15.16. To promote the urban allotments network</b> for its social function and as an outreach tool, and <b>foster ecological peri-urban agriculture and livestock</b> together with supra-municipal authorities.	2025	Barcelona City Council

## MEDIUM- AND LONG-TERM ACTIONS (2026-2030) THAT NEED PROMOTING:

ACTIONS	DATE	PLAYERS INVOLVED
15.17. To promote the creation of food shops and spaces in markets intended to showcase quality food with short expiry dates for the purposes of encouraging savings and reducing food waste.	2030	Barcelona City Council

### MUNICIPAL PLAYERS INVOLVED

- Urban Ecology.
- Social Rights, Global Justice, Feminism and LGBTI Affairs.
- Districts.
- Commissioner for Cooperative, Social and Solidarity Economy
- Enterprise, Culture and Innovation.
- Economy, Resources and Economic Promotion.

### MONITORING INDICATORS

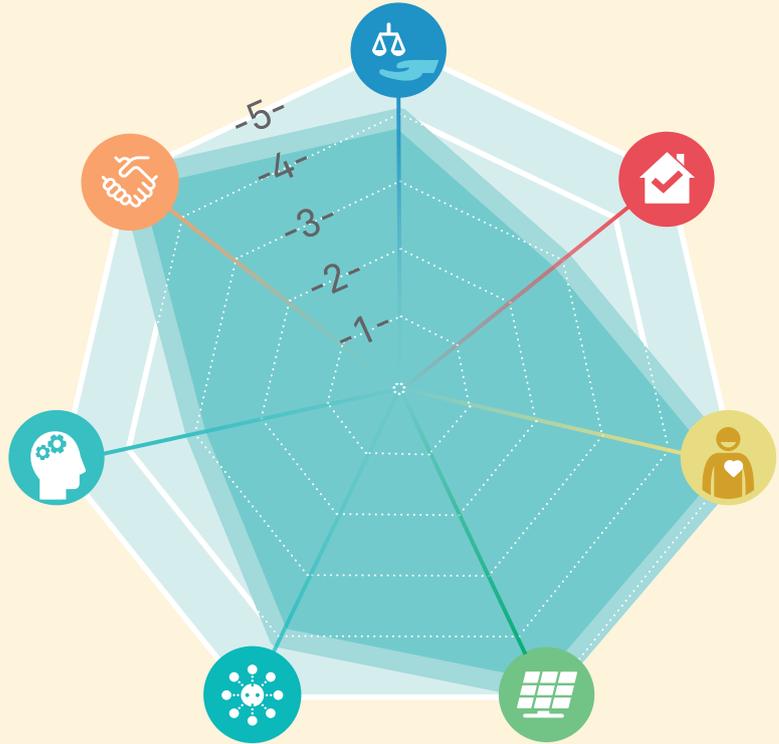
- Number of farmers' markets per district.
- Number of markets selling local products.
- Number of municipal canteens with organic seasonal products.
- Urban and metropolitan surface area devoted to agriculture (hectares).
- Municipal canteens serving low-carbon food (%).
- Fresh vegetables produced in Barcelona province and consumed in the city (%).

### STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN



## VALUES OF THE CLIMATE EMERGENCY ACTION PLAN

-  SOCIALLY FAIR BARCELONA
-  HABITABLE, SAFE BARCELONA
-  HEALTHY BARCELONA
-  EFFICIENT, RENEWABLE BARCELONA
-  LOW-CARBON, DISTRIBUTIVE BARCELONA
-  BARCELONA THAT LEARNS
-  COMMITTED BARCELONIANS



- ASSOCIATED LINES OF ACTION:**
-  Food sovereignty
  -  Taking care of everyone
  -  No cuts
  -  To guarantee thermal comfort
  -  Better than new buildings
  -  Reclaiming roof terraces
  -  Climate-based urban transformation
  -  Many more green areas
  -  Not a single drop wasted
  -  Renewables in public areas
  -  Good mobility
  -  Protecting the coastline and our rivers
  -  Green and circular economy
  -  Responsible consumption
  -  Zero waste
  -  Cultural action for the climate
  -  Climate cooperation
  -  Let's get organised



# CLIMATE CULTURE

Most of the population and, therefore, collective intelligence, is concentrated in cities. If everyone (citizens, businesses, institutions, the local authority, etc.) works together and there is cooperation between cities and regions, the change we need will come about.

Innovation is essential and we have to equip ourselves with the necessary knowledge, tools, structures and resources to tackle climate change. Education and communication are vital instruments for spreading knowledge and helping to raise everyone's awareness. Likewise, we need to facilitate and foster citizen debate and action.



## GOALS AND TARGETS FOR 2030:

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 To use €1 million/year for financial aid to carry out climate-related citizen projects.

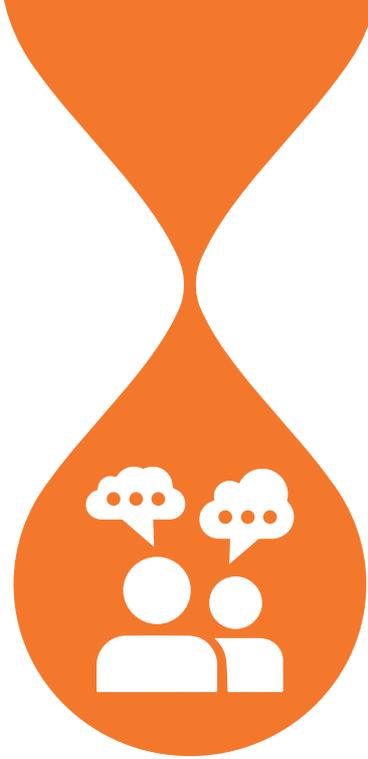
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 To have a person in charge of climate and a cultural facility on sustainability for each district.

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# CULTURAL ACTION FOR THE CLIMATE

To transform a culture based on the consumption of energy and resources into a culture that recognises the planetary boundaries and sustainable ways of life.



### JUSTIFICATION AND BENEFITS

Culture is a key element for overcoming any crisis, as the cultural context is the reference framework which shapes the way people live and act. We are faced with the challenge of transforming a culture based on increasing consumption of energy and resources, ignoring the undesirable effects this has on our habitat, into a culture that recognises planetary limits and fosters sustainable ways of living.

Therefore, we need to expand our knowledge and help raise awareness among individuals, organisations, institutions and businesses in Barcelona, so that everyone can assume their own responsibility and together we can shoulder the city's responsibility.

Education, communication and encouraging citizens to take action are vital instruments for advancing down this road, and must be firmly promoted by the City Council. The More Sustainable Barcelona network, made up by the signatories to the Citizen Commitment to Sustainability, is a key piece in this cultural transformation. New citizen projects developed under the Barcelona's Commitment to the Climate are a very

good example of co-production. We also need to take advantage of the socialisation possibilities offered by ICTs for openly circulating knowledge, ideas and proposals among interconnected citizens.

On top of that, Barcelona has a very interesting community network at neighbourhood level, which could be very useful in dealing with climate change on a smaller scale. This is an opportunity for generating intersectoral (between various professional and interest spheres), interterritorial (between districts and neighbourhoods) and intergenerational dialogue (between the young and elderly population) to spread habits locally.

There are also facilities on a district level that could serve as active catalysts, such as the environmental classrooms (Bosc Turull, Sagrada Família, Centre Cívic Can Deu, Casa de l'Aigua) and the energy advice points. The city has three benchmark environmental facilities: the Fàbrica del Sol, the Beach Centre and the Parc de la Ciutadella's environmental Recreational Family Space.

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### ACTIONS OF THE PLAN

#### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Creation of energy advice points and guaranteeing basic utility supplies (2016).

## ILLUSTRATIVE ACTION



### Specific call for subsidy applications for citizen climate projects

The City Council encourages citizen organisations to play a prominent and active role in the fight against climate change and promotes their initiatives.

The purpose of the subsidies is to provide financial support for projects that promote the reduction of greenhouse gas emissions, adapting the city to climate change and climate justice.

The call highlights the fact they should be cooperative projects involving at least three organisations, with one acting as leader, and that the subsidy may be up to 80% with a maximum of €20,000 per project.

The subsidies have a 200,000 euro budget every two years.

## PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

ACTIONS	DATE	PLAYERS INVOLVED
16.1. To extensively disseminate information on available opportunities, financial aid and support (renovation, energy-efficiency improvements, training and so on.)	Ongoing	Barcelona City Council
16.2. To have a climate and sustainability manager and a facility in each district, for the purposes of promoting climate action and extending sustainability culture to neighbourhoods.	2025	Barcelona City Council
16.3. Providing €1 million/year of financial aid for carrying out projects that contribute to the goals of the Climate Emergency Action Plan and the Climate Emergency Declaration.	2025	Barcelona City Council

## SHORT-TERM ACTIONS (2018-2025):

ACTIONS	DATE	PLAYERS INVOLVED
16.4. To spread knowledge of the climate emergency by using existing communication channels: messages at primary healthcare centres (CAPs), metro channels, etc.	Ongoing	TMB, Health Consortium
16.5. To raise awareness of the various player's commitments, initiatives and good practices.	Ongoing	Barcelona City Council
16.6. To establish the necessary mechanisms for ensuring participation from people who are vulnerable to climate change.	2020	Barcelona City Council
16.7. To strengthen support programmes in schools, shops and local organisations as spaces for climate awareness and action. To develop an educational programme on climate change for city schools, including climate transition programmes geared towards young people (secondary schools, universities).	2025	Barcelona City Council

ACTIONS	DATE	PLAYERS INVOLVED
<b>16.8. To publicise the climate emergency declaration through a travelling exhibition</b> that covers the city's ten districts as well as various schools.	2025	Barcelona City Council
<b>16.9. To ensure access to climate information.</b> To promote citizen science to obtain and share data on temperature, relative humidity, warnings, phenology, bird migrations and so on. To carry out more publicity and adapt information channels. To have climate information available relating to people's everyday lives and activities.	2025	Barcelona City Council
<b>16.10. To promote climate emergency initiatives (energy improvements, guaranteed environmental quality, sustainable mobility etc.) from the cultural facilities run by the ICUB or with municipal participation.</b>	2025	Barcelona City Council
<b>16.11. To incorporate information and discussion on the climate emergency and future model into the cultural programme, with the involvement of cultural facilities</b> (libraries, museums, community centres, neighbourhood centre, youth centres) and dedicate international days and weeks to the climate crisis.	2025	Barcelona City Council
<b>16.12. To introduce criteria for reducing the climate impact, and the 2030 Sustainable Development Agenda at five major city events</b> (for example, La Mercè, the Marathon, Grec Festival, Smart City Expo World Congress, Mobile World Congress) and neighbourhood festivals.	2025	Barcelona City Council
<b>16.13. To promote the creation of citizen co-responsibility networks and climate-action groups at the neighbourhood level.</b>	2025	Barcelona City Council

## MEDIUM- AND LONG-TERM ACTIONS (2026-2030) THAT NEED PROMOTING:

ACTIONS	DATE	PLAYERS INVOLVED
<b>16.14. To strengthen participation from the region's social fabric in defining urban-planning, greenery and mobility proposals for mitigating the effects of climate change (throughout the process).</b>	2030	Barcelona City Council
<b>16.15. To have an energy-efficiency and climate-change interpretation centre available at a city level.</b>	2030	Barcelona City Council

### MUNICIPAL PLAYERS INVOLVED

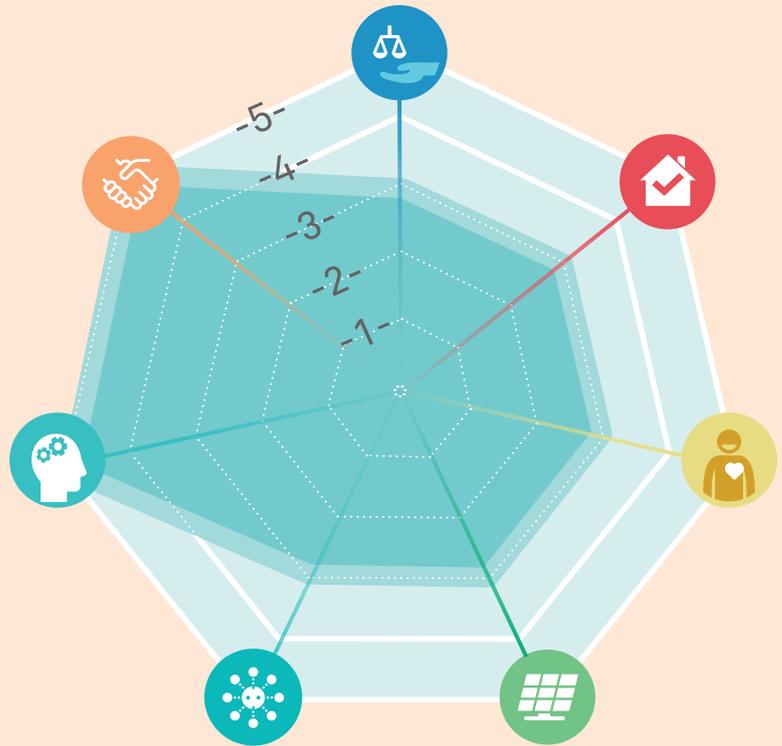
- Urban Ecology.
- Districts.
- Barcelona Institute of Culture.
- Barcelona Education Consortium.
- Barcelona Municipal Institute of Education.

### MONITORING INDICATORS

- Number of organisations committed to citizen climate projects.
- Number of co-produced climate projects.
- Number of districts with climate and sustainability benchmarks.
- Number of districts with environmental education facilities.
- Number of energy advice point consultations.
- Number of greened city events.
- Financial aid to carry out climate-related citizen projects (€/year).

## VALUES OF THE CLIMATE EMERGENCY ACTION PLAN

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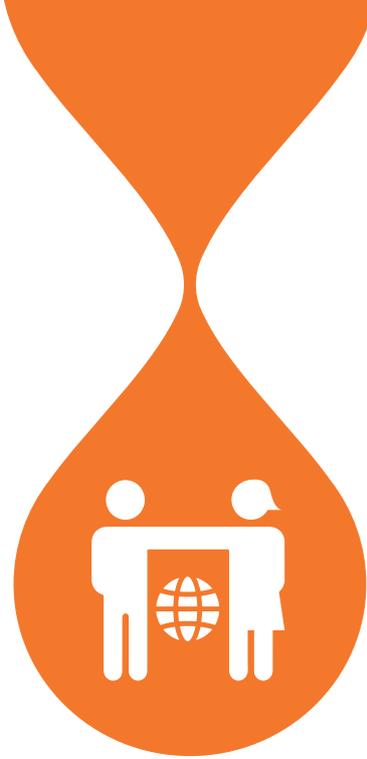


## STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN



- ASSOCIATED LINES OF ACTION:**
-  Cultural action for the climate
  -  Taking care of everyone
  -  No cuts
  -  To guarantee thermal comfort
  -  Better than new buildings
  -  Reclaiming roof terraces
  -  Climate-based urban transformation
  -  Many more green areas
  -  Not a single drop wasted
  -  Renewables in public areas
  -  Good mobility
  -  Protecting the coastline and our rivers
  -  Green and circular economy
  -  Responsible consumption
  -  Zero waste
  -  Food sovereignty
  -  Climate cooperation
  -  Let's get organised

# CLIMATE COOPERATION



To facilitate collective learning/ action projects and involve people and organisations in them. To grant financial aid for implementing projects that help to tackle climate change.

## JUSTIFICATION AND BENEFITS

In a mainly urban world, cities are the key to ensuring social equity, sustainable development and quality of life. However, the consumption habits of the inhabitants of the most prosperous cities such as Barcelona often generate a big ecological debt that falls on the most vulnerable societies, regions and countries. As a city in the Northern hemisphere, Barcelona must take the initiative and drastically reduce its emissions in order to improve social justice and not compromise the

sustainability or everyday lives of the most vulnerable populations.

We need to make people more aware that our habits and the way we consume impact on everyday life and increase the risks for other parts of the world, as well as promote international cooperation projects aimed at reversing the ecological debt that the city has acquired.

## ACTIONS OF THE PLAN

### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Cooperation for Social Justice Master Plan (2018-2021).

### PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

ACTIONS	DATE	PLAYERS INVOLVED
17.1. To prepare for taking in climate refugees.	2030	Barcelona City Council

## ILLUSTRATIVE ACTION



### Support for solid urban waste management in the outlying districts of Maputo (Mozambique)

Barcelona City Council's Department of Global Justice and International Cooperation funds projects to promote climate justice in Mediterranean, African and Latin American countries.

Maputo generates more than 1,100 tonnes of solid waste very day but almost 500 tonnes of that is not

collected. In the city's outlying districts, which lack many basic services, solid urban waste management (GRSU) is now becoming a serious environmental, social and health problem.

Urban areas like the Maxaquene neighbourhood have grown out of the chaotic occupation of public spaces. That makes it enormously difficult to introduce, roll out and maintain basic services and the consequences of that are seriously affecting the daily lives of the people who live there.

The main purpose of the Maxaquene project is to improve GRSU in the neighbourhood by strengthening the network of primary collection associations with a social and solidarity focus, along with raising community awareness regarding the importance of recycling and the social, economic and environmental benefits of the work done by informal recyclers (*catadors*).

The activities have mainly been designed and implemented by two local organisations, Kutenga and Comsol, with the support of the Maxaquene neighbourhood development platform and in collaboration with the NGO Enginyeria Sense Fronteres (Engineering Without Borders).

## SHORT-TERM ACTIONS (2018-2025):

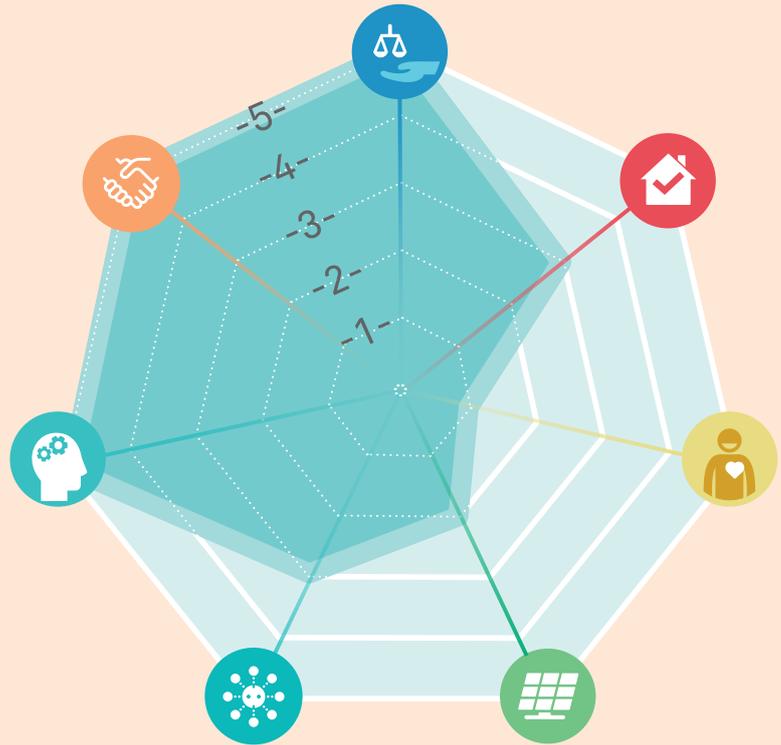
ACTIONS	DATE	PLAYERS INVOLVED
<b>17.2. To generate more active social involvement in highlighting the effects of climate change on the most vulnerable countries and societies</b> , and to launch educational and awareness-raising campaigns on Barcelona's ecological debt.	Ongoing	Barcelona City Council
<b>17.3. To define a comprehensive strategy for reducing Barcelona's ecological debt</b> that prioritises actions that have the biggest impact on third parties.	2025	Barcelona City Council

## MEDIUM- AND LONG-TERM ACTIONS (2026-2030) THAT NEED PROMOTING:

ACTIONS	DATE	PLAYERS INVOLVED
<b>17.4. To generate more knowledge around the impact of the climate crisis on global inequalities, migrations (climate refugees) and human rights.</b>	2030	Barcelona City Council
<b>17.5. To promote cooperation between cities on climate justice</b> , in the subsidy call and direct, city-city cooperation.	2030	Barcelona City Council

## VALUES OF THE CLIMATE EMERGENCY ACTION PLAN

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## STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN



## MUNICIPAL PLAYERS INVOLVED

- Mayor's Office.
- Districts.
- Social Rights, Global Justice, Feminism and LGBTI Affairs.
- Economy, Resources and Economic Promotion.

## MONITORING INDICATORS

- Number of international cooperation projects that have been carried out to correct climate change.
- Budget for international cooperation projects designed to improve climate justice (€).

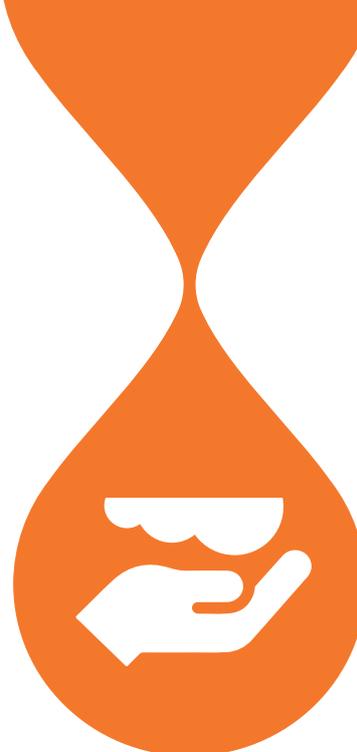


### ASSOCIATED LINES OF ACTION:



## LET'S GET ORGANISED

Incorporating organisational changes and changes to working methods that enable sustainability and resilience criteria to be integrated into the city's planning, transformation and management.



### JUSTIFICATION AND BENEFITS

Climate change is a global challenge that requires local actions. It is also a phenomenon that involves lots of environmental vectors (water, energy, biodiversity, waste, etc.). Consequently, it cannot be tackled in isolation by a specific local authority department. It requires a cross-departmental approach that takes the complexity of this phenomenon into account. That means involving the whole local authority, along with the other key players in the city.

Another major challenge is to incorporate the climate change variable into long-term city planning and management, not just because it implies setting goals and targets or acquiring commitments in the long term but also due to the uncertainty inherent in future projections and in managing climate impacts and the

risks that flow from them. We will have to deepen our knowledge and improve the information available to us for making decisions, managing and putting climate action into practice.

This new working approach will also require tools that enable a more detailed analysis of the impacts and how these will affect people, generate internal training for the technical team involved and ensure accessibility to this new information.

In turn, that will require changes on an organisational and working methodology level which will enable sustainability and resilience criteria to be integrated into city planning, transformation and management processes from a global, systemic city perspective.

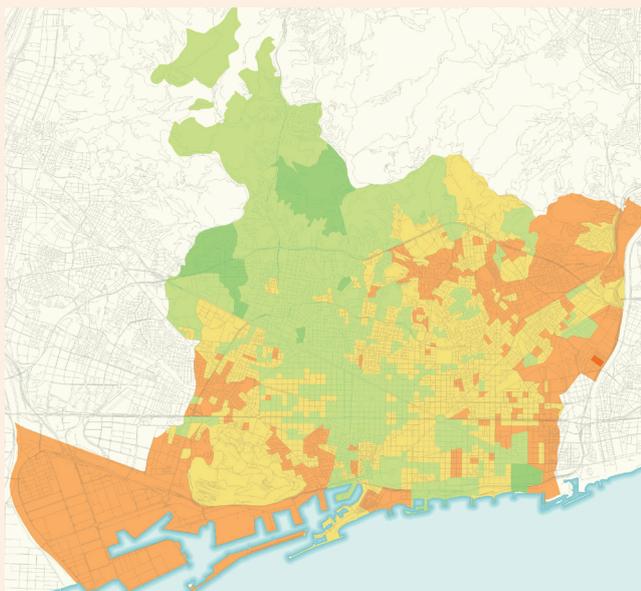
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### ACTIONS OF THE PLAN

#### ACTIONS ALREADY ENVISAGED IN THE EXISTING PLANS:

- Urban resilience (2016).
- Barcelona Science Plan (2020-2030).

## ILLUSTRATIVE ACTION



**The urban resilience information and analysis platform aims to provide a comprehensive overview of the city, by bringing together all the critical or relevant information gathered from the various systems involved.**

Managing the city is a complex task due to the multiple operators involved and because, despite the obvious interdependencies between the different urban systems, they often manage their information separately.

This platform opens up a new possibility of managing and sharing information with all the agencies involved and enables the joint analysis of data which, up to now, was impossible to correlate, thereby providing new information to support decision-making processes both at a strategic and operational level.

## PRIORITY INITIATIVES IN THE POST-COVID-19 CONTEXT:

ACTIONS	DATE	PLAYERS INVOLVED
<b>18.1. To increase climate research (Barcelona Science Plan) to improve knowledge of climate change in the city.</b> To communicate new knowledge through the website, science conferences, talks, etc..	Ongoing	Barcelona City Council
<b>18.2. To create a climate office to work</b> across all areas on climate change from within the organisation and establish a committee to monitor the implementation of the Climate Plan initiatives, made up of a core team driving the plan and other key players.	2020	Barcelona City Council
<b>18.3. To study the reduction of energy expenditure associated with working-hour adaptations.</b>	2020	Barcelona City Council
<b>18.4. To implement the carbon budget.</b>	2025	Barcelona City Council
<b>18.5. To revise municipal emergency plans in the light of the new information generated on climate change.</b>	2025	Barcelona City Council
<b>18.6. To improve the public information provided during pollution episodes and warnings of new risks.</b>	2025	Barcelona City Council

## SHORT-TERM ACTIONS (2018-2025):

ACTIONS	DATE	PLAYERS INVOLVED
<b>18.7. To study each neighbourhood's contribution to the generation of greenhouse gases</b> to determine possible inequalities.	Ongoing	Barcelona City Council
<b>18.8. To include, within a resilience platform, a common repository of climate information</b> that ensures accessibility to all the players involved.	Ongoing	Barcelona City Council

ACTIONS	DATE	PLAYERS INVOLVED
<b>18.9. To improve communication systems with critical city facilities and services during extreme climate episodes.</b>	Ongoing	Barcelona City Council
<b>18.10. To publish relevant information, through Open Data, not just on climate impact but also on monitoring of initiatives carried out (transparency).</b>	Ongoing	Barcelona City Council
<b>18.11. To define and calculate the monitoring indicators of the Climate Emergency Action Plan</b> and citizen co-production products and to draw up and publish periodic reports that comply with the Covenant of Mayors for Climate and Energy.	Ongoing	Barcelona City Council
<b>18.12. To review and update the Climate Emergency Action Plan.</b>	Ongoing	Barcelona City Council
<b>18.13. To establish the necessary external coordination mechanisms</b> and communication between the various authorities (especially Barcelona Provincial Council, the Metropolitan Area and the Catalan government), as well as with other key city players, for the purposes of creating synergies and enabling the achievement of the Climate Plan's goals, while boosting the role of the Citizen Council for Sustainability.	2018	Barcelona City Council
<b>18.14. To incorporate a line of climate action for launching resilience committee projects.</b>	2018	Barcelona City Council
<b>18.15. Develop an internal training plan</b> that incorporates specific training in jobs directly involved in climate action, as well as outreach and awareness-raising sessions on the importance of climate change.	2020	Barcelona City Council
<b>18.16. To learn more about the impact of climate change on the continuity of the city's services and critical infrastructures</b> (healthcare services, utility supplies, etc.) and their inter-dependence.	2020	Barcelona City Council
<b>18.17. To study how climate change may have economic repercussions on the city</b> (changes in the prices of basic utilities and food supplies, in tourist-load capacities, etc.) To reduce emissions from tourist activities.	2020	Barcelona City Council
<b>18.18. To create a resilience atlas</b> that includes vulnerability maps and ensures the information is accessible to all the municipal players involved in the processes for urban planning, transformation and services.	2020	Barcelona City Council
<b>18.19. To map the Climate Emergency Action Plan initiatives launched and publish them in the resilience atlas.</b>	2020	Barcelona City Council
<b>18.20. To learn more about how climate change will affect Barcelona,</b> through participation in the European RESCCUE project.	2025	Barcelona City Council
<b>18.21. To systematise the use of climate information</b> among municipal experts, set up tools that enable new information to be shared more effectively (resilience platform) and give staff the skills to use them, through the necessary training (extending the use of geographic information systems within the organisation to improve analysis capacity, etc.)	2025	Barcelona City Council

## MEDIUM- AND LONG-TERM ACTIONS (2026-2030) THAT NEED PROMOTING:

ACTIONS	DATE	PLAYERS INVOLVED
<b>18.22. To establish internal coordination mechanisms</b> for ensuring notification of the progress made and monitoring the accompanying sectoral plans.	2030	Barcelona City Council
<b>18.23. To take part in city networks</b> and encourage the exchange of good practices and collaborate with leading international institutions, to position Barcelona as a model for climate action and report the results in accordance with the commitments made.	2030	Barcelona City Council

### MUNICIPAL PLAYERS INVOLVED

- Urban Ecology.
- Districts.
- Social Rights, Global Justice, Feminism and LGBTI Affairs.
- Safety and Prevention.
- Economy, Resources and Economic Promotion.
- Culture, Education, Science and Community
- Barcelona Public Health Agency.

### MONITORING INDICATORS

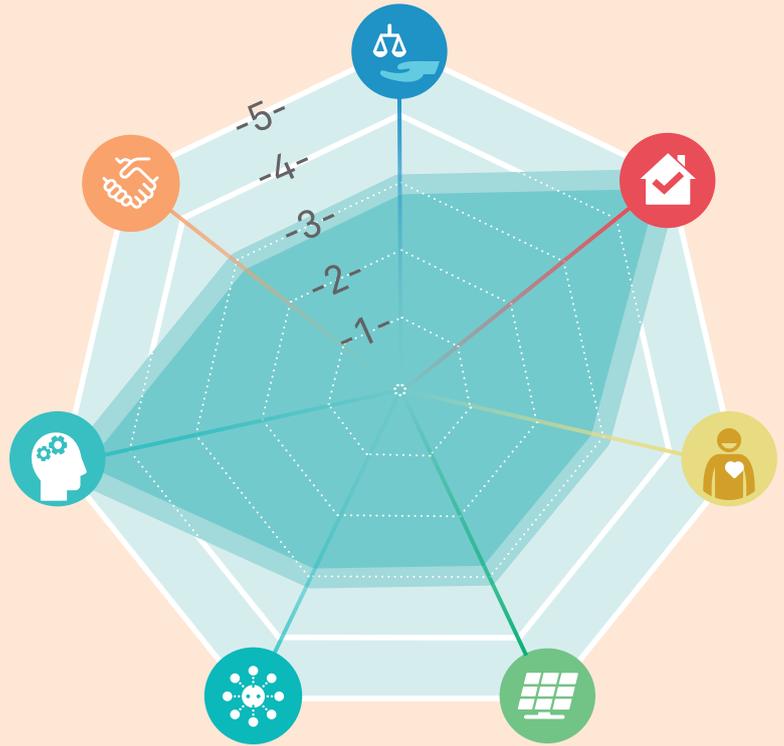
- Number of people trained on climate change.
- Amount of participation in research projects and improving our knowledge of climate change.
- Amount of content published on the resilience platform and other tools for access to information.

### STRATEGIC LINES OF THE CLIMATE EMERGENCY ACTION PLAN



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Let's get organised

## ASSOCIATED LINES OF ACTION:



Taking care of everyone



No cuts



To guarantee thermal comfort



Better than new buildings



Reclaiming roof terraces



Climate-based urban transformation



Many more green areas



Not a single drop wasted



Renewables in public areas



Good mobility



Protecting the coastline and our rivers



Green and circular economy



Responsible consumption



Zero waste



Food sovereignty

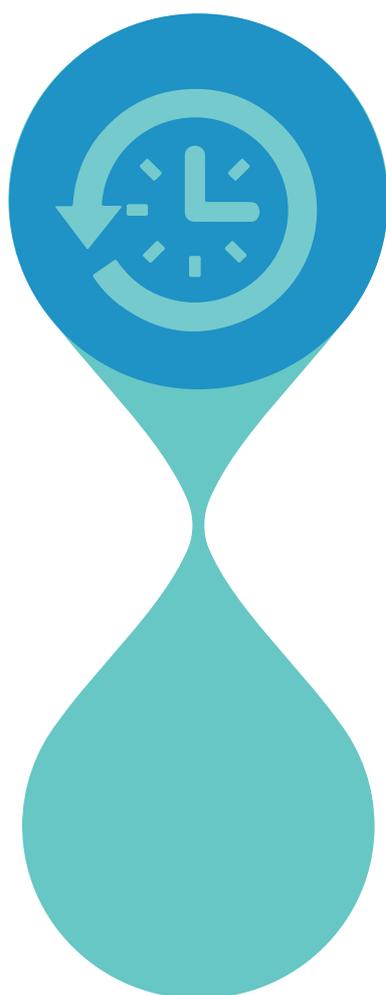


Cultural action for the climate



Climate cooperation

# 12. TIMEFRAME



## Line of action 1. **TAKING CARE OF EVERYONE**

	Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
1.1. To improve the social network of elderly people who live alone and reinforce existing projects and specific actions aimed at vulnerable groups such as the promotion of the telecare service.	●	.	2020	.
1.2. To deploy the necessary mechanisms to increase the significance of public aid focusing on energy, the environment and social justice.	●	.	2025	.
1.3. To create at least 10 neighbourhood villages geared towards providing a comprehensive care service for dependent persons, with local home care service teams.	●	.	2025	.
1.4. To make progress in the guarantee of the right to food in an inclusive and dignified manner.	●	.	2025	.
1.5. To foster green employment in economic sectors linked to climate change. To give the Labora project an environmental vision.	●	.	2025	.
1.6. To reduce the nuisance caused by bad smells by improving waste collection and sewage systems in the event of hot weather.	.	●	.	.
1.7. To create support roles to facilitate and advise on the renovation actions to be carried out.	.	.	2020	.
1.8. To specifically train Home Assistance Service (SAD) workers to identify situations of energy poverty and vulnerability to heat/cold, as well as to propose initiatives for improving thermal comfort in the home.	.	.	2020	.
1.9. To generate knowledge on the distinct effects of the climate crisis on women and Barcelona's most vulnerable groups.	.	.	.	2030



## Line of action 2. **NO CUTS**

	Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
2.1. To promote and prioritise self-production of energy from renewable sources and to make it accessible also to vulnerable households.	●	·	2025	·
2.2. To guarantee energy and water supplies and uninterrupted service of the critical facilities and infrastructures in emergency situations.	●	·	2025	·
2.3. To deploy the municipal energy operator that promotes the production of renewable energies in the municipality.	·	●	·	·
2.4. To create a municipal energy supplier at the service of all citizens.	·	·	2018	·
2.5. To revise the domestic sewage tax so it includes discounts for sensitive groups.	·	·	2020	·
2.6. To turn the current energy advice points into climate advice points in order to continue to guarantee basic services for people in a vulnerable situation.	·	·	2020	·
2.7. To improve our knowledge of the relationship between energy poverty and health.	·	·	2025	·
2.8. To promote “energy banks” that can help to cover the needs of energy-vulnerable households.	·	·	2025	·
2.9. To promote actions and agreements to ensure the public supply of potable water to the city.	·	·	·	2030



## Line of action 3. **TO GUARANTEE THERMAL COMFORT**

	Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
3.1. To make 100 municipal facilities (facilities and parks) available to act as climate shelters in the event of an extreme climate emergency, and have a reference facility in each district.	●	·	2025	·
3.2. To prioritise the cooling actions carried out in those geographic areas that are most vulnerable to heat.	●	·	2025	·
3.3. To create the “Barcelona, city of shade” intervention programme on public spaces, to generate more shaded areas.	●	·	2025	·
3.4. To improve the thermal comfort of 40 state-run schools (Education Consortium), 4 municipal care homes for the elderly and 2 early intervention centres for children with disabilities.	●	·	2025	·
3.5. To review the heat wave emergency protocol activation criteria.	·	·	2025	·
3.6. To deepen our knowledge of how climate change affects the health and mortality of people in each neighbourhood, through the European research project funded by Climate-fit.city, in which the ASPB and ISGLOBAL participate.	·	·	2025	·
3.7. To learn more about the urban climate with the implementation of a network of fixed weather stations as well as pop-up or mobile stations.	·	·	2025	·
3.8. To continue identifying, preparing and activating climate shelter spaces to ensure the desired degree of cover and, if necessary, to create new ones.	·	·	·	2030
3.9. To have a space for water games in a public area in each district.	·	·	·	2030
3.10. To reinforce socio-healthcare facilities and staff teams to deal with exceptional weather events.	·	·	·	2030
3.11. To intervene on the city’s roads and roof terraces and help to mitigate the heat-island effect.	·	·	·	2030



## Line of action 4. **BETTER THAN NEW BUILDINGS**

	Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
4.1. To study and establish the technical specifications for the new thermal comfort standards that Barcelona wants to achieve locally, and work on changing the mentality of building developers and users.	●	.	2020	.
4.2. To develop a regulatory framework for the use of heating/air conditioning in the commercial and services sector.	●	.	2020	.
4.3. To undertake communication and publicity actions to encourage energy savings in buildings.	.	●	.	.
4.4. To monitor the energy performance of buildings, housing and public facilities to provide knowledge of their consumption and the energy improvements applied.	.	●	.	.
4.5. To analyse how much time will be required for the new, more environmentally responsible systems.	.	.	2020	.
4.6. To study traditional energy solutions and how to fit them into the modern building context.	.	.	2025	.
4.7. To draw up a building energy byelaw that ensures that new buildings or those undergoing wholesale renovation in the city are minimum-demand and maximum-generation as regards energy.	.	.	2025	.
4.8. To guarantee efficient energy management of the municipal services linked to the water cycle and waste management and collection in order to achieve a 10% saving in electricity consumption in the buildings concerned.	.	.	.	2030
4.9. To develop and consolidate the existing heating and cooling grids in the city, and define and promote a new one in La Sagrera.	.	.	.	2030



## Line of action 5. **RECOVERING TERRACE ROOFS**

	Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
5.1. To develop 10 green roofs and façades in municipal buildings.	●	●	.	.
5.2. To fill the city's roof terraces with solar installations, making it easier to install them and boosting the financial incentives, such as grants and subsidies, tax breaks and/or other funding mechanisms.	●	●	.	.
5.3. To start a process whereby up to 25 MWp of photovoltaic energy is installed in large urban spaces by 2025.	●	.	.	2030
5.4. To draft a byelaw to encourage productive roofs for new buildings and major renovations and in cases of changes of use of buildings.	.	.	2018	.
5.5. To draw up technical instructions for public buildings that include the use of productive roofs/walls/façades.	.	.	2018	.
5.6. To approve a byelaw that makes the use of greywater, rainwater or regenerated water compulsory in new buildings or major renovations.	.	.	2025	.



## Line of action 6.

# CLIMATE-BASED URBAN TRANSFORMATION

	Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
6.1. To influence high-level planning instruments to incorporate urban factors that ensure a true presence of high-quality greenery.	●	●	.	.
6.2. To adapt the necessary current urban-planning regulations so they can help to achieve climate change mitigation and adaptation goals.	.	●	.	.
6.3. To incorporate the climate emergency aspect into strategic metropolitan transformations, such as: Parc de les Glòries, Avinguda Meridiana, Parc de la Sagrera or the seafront.	.	●	.	.
6.4. To further analyse how climate change specifically affects each district in order to identify possible risks and vulnerabilities and define specific actions to address them.	.	.	2020	.
6.5. To locate and characterise the areas at risk.	.	.	2020	.
6.6. To draw up a design guide with sustainability and resilience criteria tailored for architects, engineers and so on, as well as for key players, such as research centres and universities.	.	.	2020	.
6.7. To protect schools with environmental and road safety measures. Actions at 200 schools until 2024.	.	.	2024	.
6.8. To draft a Greenery and Biodiversity Charter to provide a tool that features the technical, environmental and design criteria that will have to be borne in mind when planning green spaces and urban trees, in order to conserve and enhance the city's plant and animal diversity.	.	.	2025	.
6.9. To differentiate between the various urban fabrics according to the risks that affect them so that corrective measures can be incorporated in planning reviews.	.	.	2025	.
6.10. To keep sufficient space in the soil and subsoil to allow for the provision of the necessary climate services.	.	.	2025	.
6.11. To rethink and adapt criteria in the project and works protocols and in the technical specifications for urban spaces.	.	.	.	2030
6.12. To speed up the installation of renewable energies in Catalonia so that 50% of electricity consumption in Catalonia will be from renewable sources by 2030.	.	.	.	2030



## Line of action 7.

# MANY MORE GREEN AREAS

	Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
7.1. To increase 40 hectares of public green spaces in Barcelona to provide high socio-environmental services, prioritising those places with the greatest deficit, and approve an instrument for the effective protection of private green spaces.	●	.	2025	.
7.2. To maintain the prevention and firefighting services.	.	●	.	.
7.3. To incorporate climate change criteria into the Special Plan for the protection of the natural environment and landscape of the Serra de Collserola natural park.	.	.	2020	.
7.4. To find solutions to the problem of mosquito reproduction in scuppers and reservoir roofs.	.	.	2020	.
7.5. To consolidate the control programmes for arboviruses and other diseases transmitted by vectors and the mosquito-control protocols.	.	.	2025	.

7.6.	To promote urban green corridors, paying special attention to the Ciutadella-Collserola corridor with the action on Carrer de Pi i Margall.	.	.	2025	.
7.7.	To step up comprehensive pest control with minimum use of insecticides and biocides.	.	.	2025	.
7.8.	To produce a catalogue of tree species.	.	.	2025	.
7.9.	To decide which zones need more thermoregulatory vegetation, and those where this is not necessary and xerophile vegetation may be sufficient. In parks, priority must be given to native or well adapted species.	.	.	2025	.
7.10.	To improve our knowledge of the effects of climate change on natural systems.	.	.	2025	.
7.11.	To create ephemeral or seasonal gardens (10 per year, one per district) (2025).	.	.	2025	.
7.12.	To develop the necessary programmes for protecting the species that are most vulnerable to climate change.	.	.	.	2030
7.13.	To create 10 biodiversity shelters as an essential part of the urban green infrastructure.	.	.	.	2030
7.14.	To restore the beds of the Llobregat and Besòs rivers and improve their water quality as well as that of the aquifers.	.	.	.	2030
7.15.	To reclaim the Rec Comtal.	.	.	.	2030



## Line of action 8. **NOT A SINGLE DROP WASTED**

		Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
8.1.	To achieve a consumption of 100 l/inhab./day of domestic drinking water.	●	.	.	2030
8.2.	To foster water saving on a municipal level in irrigation, fountains, cleaning and municipal buildings.	.	●	.	.
8.3.	To incorporate up-to-date climate forecasts in future revisions of the Drought Protocol.	.	.	2018	.
8.4.	To provide for tree irrigation and increase it where necessary in order to obtain the desired evapotranspiration and cooling services.	.	.	2020	.
8.5.	To assess and continually monitor the quality of groundwater.	.	.	2020	.
8.6.	To have a city supply plan for Barcelona.	.	.	2020	.
8.7.	To increase the sustainable urban drainage systems (SUDS) by 20,000 m <sup>2</sup> by 2024.	.	.	2024	.
8.8.	To replace 100,000 m <sup>3</sup> /year of potable water with alternative water resources for the municipal uses for which they are appropriate by 2024.	.	.	2024	.
8.9.	To promote the use of greywater in new housing developments and renovations or for industrial purposes, and to study its inclusion in future versions of the Municipal Urban Environment Byelaw.	.	.	2025	.
8.10.	To study the energy impact of supplying water (the desalination plant, regenerated water plants, etc.).	.	.	2025	.
8.11.	To study the feasibility of producing water regenerated at the Besòs waste water treatment plant (EDAR).	.	.	2025	.
8.12.	To assess and continually monitor the quality of drinking water.	.	.	.	2030
8.13.	To permeate (unpave) 3 ha and reclaim the organic soil.	.	.	.	2030
8.14.	To use regenerated water from the El Prat Wastewater Purification Plant, with a 5 hm <sup>3</sup> potential, for industrial use in the Zona Franca and compatible residential uses (La Marina neighbourhood) and for recharging the aquifer.	.	.	.	2030

8.15. To build infiltration basins at high points of the city that result in easier infiltration and generate a flow retention and lamination effect, and to install rainwater capture systems in Collserola so it can be reused.	.	.	.	2030
8.16. To use pumped groundwater from underground facilities for municipal uses if this is possible in view of the quality of the water.	.	.	.	2030



### Line of action 9. **RENEWABLES IN PUBLIC AREAS**

	Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
9.1. To speed up the implementation of renewable energy in municipal buildings and public spaces by incorporating a further 6 MWp of photovoltaic generation in the municipal stock by 2025.	●	.	2025	.
9.2. To consider incorporating this generation in other public space elements, such as pavements, road surfaces, etc.	.	●	.	.



### Line of action 10. **GOOD MOBILITY**

	Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
10.1. To improve the reliability, competitiveness and capacity of the city's bus network. To increase the frequency and reduce the journey times of services on the basic local network.	●	●	.	.
10.2. To consider the implementation of additional measures to reduce the environmental impact of private motor transport.	●	●	.	.
10.3. To make progress in the application of ways to reduce the amount of travel required.	●	●	.	.
10.4. To consolidate the cycling infrastructure and improve the quality, connectivity and safety of the existing network while prioritising the axes that give the network its structure.	●	●	.	.
10.5. To step up the scale and pace of the Superblock programme. To transform 10 km of streets into green hubs by 2024.	●	.	2024	.
10.6. To improve pavement accessibility and comfort, increase pedestrian zones, improve vertical mobility, and increase the number of traffic-calmed streets, where maximum priority is given to pedestrians.	●	.	2025	.
10.7. To extend the strategy of car parks and regulated parking to the whole city.	●	.	2025	.
10.8. To complete the tram network and manage it better.	●	.	2025	.
10.9. To calm traffic in the city generally, to increase road safety and foster a friendly environment with lower energy consumption and fewer emissions.	●	.	2025	.
10.10. To create Park & Ride areas in collaboration with other authorities.	●	.	.	2030
10.11. To roll out the Low Emission Zone, monitor the stages envisaged and make any necessary adjustments.	.	●	.	.
10.12. To promote spaces allocated to distributing goods in order to increase efficiency and reduce their impact on GHG emissions.	.	●	.	.
10.13. To substantially increase intercity bus services.	.	●	.	.
10.14. To improve the street-level public transport interchange areas, the intermodal stations and the regional and metropolitan bus terminals.	.	●	.	.

10.15.	To provide support at state level for the creation of an ECA area in the Western Mediterranean.	.	.	2020	.
10.16.	To provide grants and subsidies for cycling to work. To promote a pilot scheme, help businesses to buy bicycles and assess the possibility of providing workers with financial compensation for the kilometres cycled to work.	.	.	2025	.
10.17.	To promote electric vehicles by creating a new charging infrastructure.	.	.	2025	.
10.18.	To draft and implement Barcelona City Council's Business Travel Plan (PDE).	.	.	2025	.
10.19.	To introduce green taxation measures in order to tax the goods distribution of big tech platforms.	.	.	2025	.
10.20.	To diversify fuels and electric vehicles in captive vehicle fleets.	.	.	2025	.
10.21.	To promote a 100% low-emission taxi fleet.	.	.	2025	.
10.22.	To renew the bus and coach fleet with less polluting technologies, and to give priority to zero-emission vehicles.	.	.	2025	.
10.23.	To implement the necessary infrastructure to electrify the Port of Barcelona wharfs, land-based machinery and captive fleets.	.	.	2025	.
10.24.	To work towards a taxation system with a markedly environmental character for vessels in the Port of Barcelona and the aviation sector.	.	.	2025	.
10.25.	To install renewable generation systems in the Port of Barcelona and Barcelona Airport, on building roofs and with pergolas in car parks.	.	.	2025	.
10.26.	To electrify and diversify municipal vehicle fleets (including waste-transport vehicles).	.	.	.	2030
10.27.	To draw up plans for reducing the emissions of infrastructures and incorporate them into the new master plans for Barcelona Airport, considering the aviation sector, and the Port of Barcelona.	.	.	.	2030
10.28.	To consider eliminating short-haul flights for journeys that can be taken by train (under seven hours) and for distances of under 1,000 km.	.	.	.	2030
10.29.	To continue with the gradual electrification of land fleets and auxiliary units to minimise the consumption of fossil fuels.	.	.	.	2030
10.30.	To encourage the use of rail transport over the airport and fewer car parks.	.	.	.	2030
10.31.	To put into service the metro actions taken under the Infrastructure Master Plan that would provide a faster and higher return.	.	.	.	2030
10.32.	To increase investment in local/commuter and regional services to improve public regional rail transport. To speed up completion of the La Sagrera station.	.	.	.	2030
10.33.	To speed up the construction of rail accesses to the Port, including the Mediterranean corridor, in order to double the transport of goods by train and reduce lorry traffic.	.	.	.	2030
10.34.	To begin a process of electrifying the Port of Barcelona, together with contracting 100% renewable energy.	.	.	.	2030
10.35.	To push for the Port of Barcelona to be a base port for cruise companies.	.	.	.	2030
10.36.	To remove the tax exemptions on kerosene in the EU both for domestic flights and in the common air space.	.	.	.	2030



## Line of action 11. **CONSERVING THE SEAFRONT**

	Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
11.1. To define and implement specific use and protection strategies for each beach.	●	.	.	2030
11.2. To analyse the social perception of the effects of climate change on beaches.	.	.	2025	.
11.3. To carry out further studies on vulnerability to erosion and sea flooding.	.	.	2025	.
11.4. To establish sediment conservation measures.	.	.	2025	.
11.5. To redefine current coastal uses.	.	.	2025	.
11.6. To promote the sustainable use of the sea.	.	.	2025	.
11.7. To naturalise the Barcelona coast.	.	.	.	2030
11.8. To increase public knowledge of the sea.	.	.	.	2030
11.9. To apply adaptation and increased resilience measures that are appropriate for the Barcelona coast.	.	.	.	2030
11.10. To increase coastal marine biodiversity by installing new artificial reefs.	.	.	.	2030
11.11. To study the effects of climate change on sea temperature and their implications for water quality, marine biodiversity, fishing and so on.	.	.	.	2030
11.12. To carry out the first stage of urgent actions under the PDISBA, which focuses on the ecological defence and protection of water bodies that affect and are affected by the urban environment against the effects of climate change on the precipitation model.	.	.	.	2030
11.13. To foster the protection and expansion of the current marine carbon sinks between the towns along the Barcelona coast, and encourage collaborative networking.	.	.	.	2030
11.14. To re-plan the model for coastal area uses aligned with a policy for the continuous improvement of environmental practices and prevention of coastal pollution.	.	.	.	2030



## Line of action 12. **GREEN AND CIRCULAR ECONOMY**

	Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
12.1. To review dealings with financial institutions to incorporate and promote ethical banking and cooperative, social and solidarity economy entities (ECSS).	●	●	.	.
12.2. To define a green-, blue- and circular-economy strategy. To promote clusters of companies from the city's renewable-energy and circular-economy sector, such as the Besòs area.	●	.	2025	.
12.3. To promote the consumption of waste recovery products and supplies.	.	●	.	.
12.4. To set up circular economy training and employment programmes through Barcelona Activa.	.	.	2020	.
12.5. To call for the implementation of the Catalan Climate Change Act, including fiscal measures.	.	.	2020	.
12.6. To adapt Barcelona Activa to promote green and local economies.	.	.	2020	.

12.7.	To establish a charge on the tax on stays in tourist accommodation.	.	.	2025	.
12.8.	To draw up public procurement guidelines for decarbonisation with Circular and Social and Solidarity Economy criteria. To introduce sustainability certification from the City Council's 2030 Agenda.	.	.	2025	.
12.9.	To call for the Catalan Social and Solidarity Economy Act to be finalised and rolled out, along with the necessary resources to do so.	.	.	2025	.
12.10.	To encourage voluntary agreements by big companies to reduce greenhouse gas emissions.	.	.	2025	.
12.11.	To promote a legal framework and instruments to increase social and sustainable public procurement in Catalonia and Spain.	.	.	2025	.
12.12.	To promote a mechanism to compensate for emissions generated by major public works in the city, in support of actions to combat climate change.	.	.	2025	.
12.13.	To reform Spanish law to enable new municipal taxes to be created in every area, particularly tourism.	.	.	2025	.
12.14.	To advise companies on the reduction of waste and emissions, both at the planning stage and when implementing improvements.	.	.	2025	.
12.15.	To study the options for improving environmental taxation for “low-carbon” companies.	.	.	2025	.



### Line of action 13. **RESPONSIBLE CONSUMPTION**

		Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long- term actions (2026-2030)
13.1.	To promote responsible consumption through exchange marketplaces.	●	.	2025	.
13.2.	To consolidate the Social and Solidarity Economy Fair and the Christmas Responsible Consumption Fair.	.	●	.	.
13.3.	To expand and strengthen the Municipalities for the Social and Solidarity Economy Network association.	.	●	.	.
13.4.	To boost the promotion of citizen and social projects and initiatives and provide continuity to the specific line of responsible-consumption subsidies.	.	●	.	.
13.5.	To create a new benchmark centre (Espai Consum) in the city that will promote responsible consumption.	.	.	2018	.
13.6.	To promote a new way of doing things that is more socially responsible and environmentally friendly with the creation of the socio-economic innovation FAR (lighthouse).	.	.	2018	.
13.7.	To enrich the Municipal Consumer Information Office (OMIC) with a responsible consumption perspective.	.	.	2020	.
13.8.	To identify and highlight the government's responsible consumption strategies and good practices in order to boost its role as a model in public policies.	.	.	2020	.
13.9.	To provide specific in-house training on responsible consumption within the City Council.	.	.	2020	.
13.10.	To apply and increase the use of social and environmental purchasing criteria in public purchasing and procurement.	.	.	2025	.
13.11.	To introduce climate emergency criteria in the terms and conditions for advertising goods and services in spaces under public control.	.	.	2025	.

13.12.	To study the carbon footprint of the different types of consumption and production in Barcelona, considering whether to introduce global emission indicators.	.	.	.	2030
 <b>Line of action 14. ZERO WASTE</b>		Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
14.1.	To roll out the “zero waste” strategy.	●	.	2025	.
14.2.	To roll out individualised collection systems for domestic and commercial waste throughout the city, increasing selective collection to 65% in order to reduce the need for incineration.	●	.	.	2030
14.3.	To promote Fab Labs 2.0.	●	.	.	2030
14.4.	To eliminate single-use plastics.	●	.	.	2030
14.5.	To apply regulatory changes to allow new Collective Increased Producer Responsibility Systems (SCRAP in Catalan) to be introduced and promote the introduction of Deposit, Return and Refund systems (SDDR).	.	●	.	.
14.6.	To optimise transport routes to reduce journeys and improve the waste collection service.	.	.	2025	.
14.7.	To reach voluntary agreements with the private sector in order to establish best practices in reducing packaging, waste, single-use plastics, etc.	.	.	2025	.
14.8.	To create a domestic waste collection tax that acts as an incentive for participating in selective waste collection.	.	.	2025	.
 <b>Line of action 15. FOOD SOVEREIGNTY</b>		Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
15.1.	To put in place and promote healthier, low-carbon diets at schools and in all municipal canteens by 2021.	●	.	2020	.
15.2.	To support and promote urban and suburban agriculture, as well as the city’s agro-ecological sector and the Parc Agrari del Llobregat.	●	.	2025	.
15.3.	To create an identification system, as well as logistical and commercial facilitation instruments, together with Mercabarna, the municipal markets, trade associations and agricultural organisations, among others.	●	.	2025	.
15.4.	To promote and boost training and activities aimed at providing knowledge on vegetarianism in different areas.	.	.	2025	.
15.5.	To create and promote farmers' markets with Barcelona’s local producers.	.	.	2025	.
15.6.	To promote and define the sustainable, healthy dining-room model.	.	.	2025	.
15.7.	To promote the use of local and organic products in the restaurant and catering sector.	.	.	2025	.
15.8.	To provide support in setting up consumer cooperative initiatives.	.	.	2025	.
15.9.	To open a wholesale market at Mercabarna for fresh organic food in 2021 that promotes the sale of ecological produce and encourages local organic producers to participate in it.	.	.	2025	.
15.10.	To open a food recycling centre at Mercabarna in 2021 (2,500 MT/year).	.	.	2025	.

15.11.	To boost the marketing of local, organic seasonal vegetables at Mercabarna, particularly those produced in abundance in Catalonia.	.	.	2025	.
15.12.	To organise the 2021 Milan Pact meeting of mayors (from 200 cities) where a city food and climate change commitment can be promoted.	.	.	2025	.
15.13	To consolidate the green markets project and create new farmers' markets fairly distributed around the territory.	.	.	2025	.
15.14.	To promote local commerce in the food sector.	.	.	2025	.
15.15.	To consider introducing legislation on establishments selling highly processed and high-protein fast food near schools.	.	.	2025	.
15.16.	To promote the urban allotments network for its social function and as an outreach tool, and foster organic suburban agriculture and livestock together with other supra-municipal authorities	.	.	2025	.
15.17.	To promote the creation of food shops and spaces in markets intended to showcase quality food with short expiry dates for the purposes of encouraging savings and reducing food waste.	.	.	.	2030



### Line of action 16.

## CULTURAL ACTION FOR CLIMATE

		Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
16.1.	To widely publicise information on the opportunities, subsidies and support available.	●	●	.	.
16.2.	To have a facility and a person in charge of climate and sustainability in each district, with the aim of promoting climate action and extending the sustainability culture to the neighbourhoods.	●	.	2025	.
16.3.	To provide €1 million/year of financial aid for carrying out projects that contribute to the goals of the Climate Emergency Action Plan and the Climate Emergency Declaration.	●	.	2025	.
16.4.	To spread knowledge of the climate emergency through existing communication channels.	.	●	.	.
16.5.	To raise awareness of the various players' commitments, initiatives and good practices.	.	●	.	.
16.6.	To establish the necessary mechanisms for ensuring participation from people who are vulnerable to climate change.	.	.	2020	.
16.7.	To reinforce the support programmes in schools, shops and entities as spaces for climate awareness and action.	.	.	2025	.
16.8.	To publicise the climate emergency declaration with a travelling exhibition that goes round the 10 city districts and various schools.	.	.	2025	.
16.9.	To ensure access to climate information.	.	.	2025	.
16.10.	To promote climate emergency actions from the cultural facilities run by the Barcelona Institute of Culture or with municipal participation.	.	.	2025	.
16.11.	To incorporate information and discussion on the climate emergency and future models into the Culture programming and with the involvement of cultural facilities.	.	.	2025	.
16.12.	To introduce criteria for reducing the climate impact and introducing the 2030 Agenda Sustainable Development criteria at five major city events and neighbourhood festivals.	.	.	2025	.
16.13.	To promote the establishment of citizen co-responsibility networks and climate action groups on a neighbourhood level.	.	.	2025	.

16.14.	To strengthen participation by the region's social fabric in the definition of urban-planning, greenery and mobility proposals for mitigating the effects of climate change.	.	.	.	2030
16.15.	To have an energy and climate-change interpretation centre available at a city level.	.	.	.	2030



### Line of action 17. **CLIMATE COOPERATION**

		Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
17.1.	To get ready to take in climate refugees.	●	.	.	2030
17.2.	To generate more active social involvement in highlighting the effects of climate change on the most vulnerable countries and societies.	.	●	.	.
17.3.	To define a comprehensive strategy for reducing Barcelona's ecological debt that prioritises those actions with the biggest impact on third parties.	.	.	2025	.
17.4.	To generate more knowledge around the impact of the climate crisis on global inequalities, migrations (climate refugees) and human rights.	.	.	.	2030
17.5.	To promote climate justice cooperation between cities in both calls for grants and subsidies and direct city-city cooperation.	.	.	.	2030



### Line of action 18. **LET'S GET ORGANISED**

		Priority initiatives in the post Covid-19 context	Ongoing	Necessary short-term actions (2018-2025)	Necessary medium- and long-term actions (2026-2030)
18.1.	To increase climate research (Barcelona Science Plan) in order to improve knowledge of climate change in the city.	●	●	.	.
18.2.	To create a climate office.	●	.	2020	.
18.3.	To study the reduction of energy expenditure associated with working-hour adaptations.	●	.	2020	.
18.4.	To implement the carbon budget.	●	.	2025	.
18.5.	To revise municipal emergency plans in the light of the new information generated on climate change.	●	.	2025	.
18.6.	To improve the information provided to the public during pollution episodes and warnings of new risks.	●	.	2025	.
18.7.	To study each neighbourhood's contribution to the generation of greenhouse gases in order to identify any possible inequalities.	.	●	.	.
18.8.	To include, within a resilience platform, a common repository of climate information that ensures accessibility for all the players involved.	.	●	.	.
18.9.	To improve communication systems with critical city facilities and services during extreme climate episodes.	.	●	.	.
18.10.	To publish relevant information, through Open Data, not just on climate impact but also on the monitoring of the initiatives carried out (transparency).	.	●	.	.

18.11. To define and calculate the monitoring indicators of the Climate Emergency Action Plan and citizen co-production products, and to draw up and publish periodic reports that comply with the Covenant of Mayors for Climate and Energy.	.	●	.	.
18.12. To review and update the Climate Emergency Action Plan.	.	●	.	.
18.13. To establish the necessary external coordination and communication mechanisms between the various authorities and the city's other key players to create synergies.	.	.	2018	.
18.14. To incorporate a climate line of action for putting resilience committee projects into practice.	.	.	2018	.
18.15. To develop an in-house training plan.	.	.	2020	.
18.16. To learn more about how climate change will affect Barcelona through participation in the European RESCCUE project.	.	.	2020	.
18.17. To study how climate change can have economic repercussions on the city. To reduce emissions from tourist activities.	.	.	2020	.
18.18. To create a resilience atlas.	.	.	2020	.
18.19. To map the Climate Emergency Action Plan initiatives launched and publish them in the resilience atlas.	.	.	2020	.
18.20. To learn more about the impact of climate change on the continuity of the city's services and critical infrastructures.	.	.	2025	.
18.21. To systematise the use of climate information.	.	.	2025	.
18.22. To establish internal coordination mechanisms for ensuring the notification of the progress made and monitoring the related sectoral plans.	.	.	.	2030
18.23. To participate in city networks.	.	.	.	2030

# 13. MONITORING



The Climate Emergency Action Plan proposes a large number of measures to achieve its strategic goals and targets. In order to assess whether the measures put into practice achieve the expected results, it also provides for a variety of indicators to monitor their development which adhere to some essential requirements: relevance, availability of easy-to-calculate data, sensitivity to changes, completeness, ease of interpretation and comparability. They include the following:

- **Impact indicators**, which measure the result achieved by the actions taken, the level of goal achievement (e.g. the reduction in GHG emissions).
- **Action indicators**, which measure the effort put in (e.g. the hours of training taught).
- **Resource indicators**, which measure the resources allocated to carrying out

the various actions (e.g. renovation grants).

- **Environment indicators**, which measure the conditions of external elements that have a link with the plan's actions (e.g. the number of hot days).
- **Perception indicators**, which measure how the public have perceived (valued) the actions and their impact.
- **Performance indicators**, which show the percentage of plan performance as an average of the performance percentages of the actions planned. This enables a quantitative, objective evaluation of the state of the plan.

The purpose of these indicators is to accurately monitor the performance of the Climate Emergency Action Plan projects and the consequences they have in the city and on its big data, in order to provide an ongoing evaluation of the plan's real impact and overall reach.

The indicators will be calculated at the start of the plan, to provide some initial data, and then updated annually. A monitoring report will be published every two years to show the level of compliance with the Covenant of Mayors for Climate and Energy. Evaluation meetings will also be held with the public and other stakeholders involved to monitor the development of collaborative projects promoted by citizen action under the Barcelona's Commitment to the Climate.

This way it will be possible to control, show and communicate how the Climate Emergency Action Plan is being applied, to enable possible deviations to be corrected and redirect measures, where necessary. In that sense, this is a dynamic plan, because it will be periodically updated and programmed in line with these results

All the information will be public and posted on the Climate Emergency Action Plan website.

# 14. WOULD YOU LIKE MORE INFORMATION?



You will find all the information on climate change in Barcelona on the Climate Emergency Action Plan website:

- Video of the Climate Plan.
- Video of the coproduction process of the plan and Barcelona's Commitment to the Climate projects.
- [Citizen action projects linked to the Barcelona's Commitment to the Climate and good practices.](#)
- Analysis of the current situation regarding adaptation to climate change.
- Energy balance (2014) and sectoral studies.
- Studies on the impact of climate change on Barcelona (climate projections and the effects on heat, the availability of water, the risk of flooding, biodiversity, energy flows, air quality, etc.).
- Plan monitoring reports
- What can you do?
- Related news
- And plenty more!

Check it out at: <http://lameva.barcelona.cat/barcelona-pel-clima/ca>

# 15. INITIALS AND SYMBOLS

ASPB:	Barcelona Public Health Agency	NGO:	Non-governmental organisation
BCASA:	Barcelona Cicle de l'Aigua, SA	PAE:	Energy advice point
CBC:	Barcelona's Commitment to the Climate	PDA:	Tree Master Plan
CO <sub>2</sub> :	Carbon dioxide	PDUM:	Metropolitan Urban Development Master Plan
COP21:	United Nations Framework Convention on Climate Change held in Paris in 2015	EP :	Energy poverty
CSIC:	Advanced Scientific Research Centre	PECQ:	Barcelona Energy, Climate Change and Air Quality Plan
ECSS:	Cooperative, social and solidarity economy	PGIL:	Comprehensive Coastline Management Plan
EDAR:	Waste water treatment plant	GDP:	Gross Domestic Product
ESS:	Social and solidarity economy	PIVU:	Programme for Promoting Urban Green Infrastructures
GHG:	Greenhouse gas	PLARHAB:	Barcelona Alternative Water Resources Plan
LPG :	Liquefied petroleum gas	PM <sub>10</sub> :	Particulate matter
GRSU:	Solid urban waste management	POCS:	Action Plan to Prevent the Effects of Heat Waves on Human Health
GWh:	Gigawatts per hour. A gigawatt is 1,000,000 kilowatts (KWh)	RCP4.5 and 8.5:	Representative Concentration Pathway 4.5 (corresponds to the committed scenario) and 8.5 (corresponds to the passive scenario). These are emission scenarios for the estimated change in greenhouse gas emissions and concentrations during the 21st century set by the International Panel on Climate Change when drafting their fifth assessment report. The four RCP scenarios are: RCP2.6, RCP4.5, RCP6 and RCP8.5. These names are based on the possible range of radiative forcing values in 2100 (2.6; 4.5; 6.0 and 8.5 W/ m <sup>2</sup> , respectively).
MVeh:	Millions of vehicles	RFD:	Disposable household income
NO <sub>2</sub> :	Nitrogen dioxide	SUDS:	Sustainable urban drainage systems
O <sub>3</sub> :	Ozone	T10:	10-year return period
OAC:	Citizen Help and Information Office	tCO <sub>2</sub> -e:	Tonnes of CO2 equivalent
OMIC:	Municipal Consumer Information Office		



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Barcelona City Council.  
November 2021.

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The Emergency Climate Action Plan for 2030 has received valuable participation from municipal technical staff from every sectoral manager's office and district at Barcelona City Council, as well as support from the Barcelona Public Health Agency, the Collserola Mountain Range Nature Park Consortium, Barcelona Port, Barcelona-El Prat Josep Tarradellas airport and the Barcelona Metropolitan Area.

It was co-produced by representatives of various associations, companies, businesses, schools and organisations, most of which are part of the More Sustainable Barcelona network, and with involvement from the Citizen Sustainability Council. Also taking part in relation to the Climate Emergency Declaration was the Climate Emergency Board. And last but not least, citizens participated on an individual level through the Decidim platform and organised meetings.

Participants on a professional level included Barcelona Regional (studies on the impact of climate change in Barcelona, in defining the plan's scenarios and in the energy assessment); the Catalan Meteorological Service (producing climate forecasts); Ana Villagordo (support in editing and graphic coordination); La Page (design and layout); Lavola (support in diagnosing the current climate -change situation in Barcelona); Toni París (support in the energy assessment); Technical Secretariat of More Sustainable Barcelona (organisation of participatory processes); Espai Tres (support in the participatory processes); El Centre (videos on the co-production process and citizen projects) Laia Ventayol (production of the Climate Plan video).

Printed on 100% recycled paper.

The CO<sub>2</sub> emissions associated with the publication of this document have been offset through the Clean CO<sub>2</sub> project in Brazil.

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**Climate Emergency Action**  
**Plan 2030**

November 2021