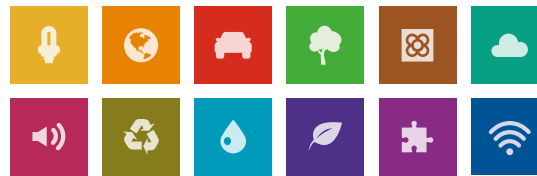


Barcelona,
a city committed
to the environment



Summary



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change mitigation

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37



Municipal greening
and the green
economy

41



Joint responsibility

45



Smart City

49

Basic Data 2013

Region



02° 07' 31" E
longitude
41° 25' 10" N latitude
412 m above sea level



10,216 hectares
municipality
158 inhab/ha
density



29.10 km²
green areas



4,395 m beaches

Climate



15.8 °C annual average
35.1 °C maximum
-1.6 °C minimum



967.0 hPa average
987.2 hPa maximum
932.6 hPa minimum



580.0 mm total
40.2 mm
maximum rainfall
112 days of rain



2,776.4 hours
of sunshine per year



69 % relative humidity

9 days of storms

Population



1,611,822 inhabitants
4,788,422 inhabitants in the
metropolitan region
82.6 % population Spanish
17.4 % population foreign



83 years
life expectancy (2012)
8.2 birth rate
9.2 death rate



7,571,766 tourists
16,485,074
overnight stays

Social indicators



€18,700/year
disposable household
income per capita



18.3 %
at risk of
poverty (2011)



89.40 %
secondary school
graduation rate
(2012-2013)



78.1 %
households with
internet access

Economic indicators



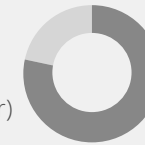
€38.500
average GDP at market
prices per inhabitant
Base year 2000



17.2 %
unemployment



78.0 %
participation
rate (4th quarter)



65.4 %
employment

Environ-
mental
indicators



18.1 m²/inhab
green areas
✓ 2003 - 17.39 m²/inhab



16,782 GWh
total energy consumption
(2012)
✗ 1999 - 15,664.78 GWh



108.4 l/inhab per day
domestic water consumption
✓ 1999 - 137.5 l/inhab. per day



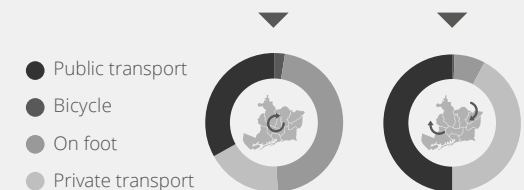
730,285 tonnes
urban solid waste
✓ 2003 - 860,338 tonnes



36.2 %
separated waste collection
✓ 2003 - 23.95 %



7.7 million
trips per day



40 micrograms/m³
average annual level of NO₂
✓ 2003 - 55 micrograms/m³



24 micrograms/m³
average annual particle
level (PM₁₀)
✓ 2008 - 36 micrograms/m³



Energy and climate change mitigation

Barcelona, a city committed to combating climate change

Energy and climate change mitigation



Vision of the future

Becoming a self-sufficient city with zero emissions

Current situation

Final energy consumption (2012) ▶



CO₂ emissions (2012) ▶



Lines of work

Committed to combating climate change
‘Signing of the Covenant of Mayors’

Innovation
‘Electrifying vehicle fleets’
‘Smart street lighting’

Self-generation
‘Solar on new and renovated buildings’
‘Renewable energies in municipal buildings’

Efficiency
‘DH&C networks taking advantage of residual cold and heat’

Self-sufficiency and reducing emissions
‘Energy Self-Sufficiency Plan’



Energy and climate change mitigation

Barcelona, in the fight against climate change, aims to become a self-sufficient city with zero emissions.

That's why a change in the energy model is required, aimed at reducing demand and consumption (savings and efficiency), increasing the self-generation of energy with renewable and residual sources and optimising infrastructure networks already in place.

General context and current situation

Over the last few years there has been an upward trend in energy consumption with consumption going from 15,664.78 GWh in 1999 to 18,036.88 GWh in 2010. This rise, however, has not been constant as the growth rate was in excess of 3% until 2005 whereas consumption gradually fell between 2005 and 2010, the year when it started to rise again. In 2012 total consumption stood at 16,782 GWh and consumption per capita at 10.35 MWh/year.

The energy consumed by Barcelona is quite evenly shared between households (with 29.3%) and commercial and service sectors (with 29.0%).

The rest is consumed by industry (17.8%), transport (22.8%) and other sectors (1.0%).


In 2012 the degree of self-sufficiency, i.e. the energy generated by local resources (renewable and residual) as a percentage of the total energy consumed by Barcelona was 2.08%.


These renewable energy sources are: 49% from solar thermal energy, 10% from photovoltaic solar energy, 32% from biogas, 2% from mini hydraulic power plants and 8% from biomass.

Regarding greenhouse gas emissions, Barcelona is among those cities in the western world with the lowest per capita emissions.


The efforts made to combat climate change, with measures to improve energy efficiency and savings and to promote renewable energy sources, have resulted in low levels of emissions. In 2012 Barcelona emitted a total of 3,690,037 tonnes of CO₂, representing 2.28 tonnes CO₂-eq per capita, notably lower than the emissions rate in 1999 which was 3.19 tonnes CO₂-eq.

Measures taken

 **Energy, Climate Change and Air Quality Plan 2011-2020 (PECQ).** This plan reinforces the link between climate change and air quality, prioritising the management of demand and promoting participation among those involved right from the initial stages. The main aim is, by 2020, to have reduced per capita emissions of GHG by 23% compared with the 2008 level. The Plan includes two parallel programmes: a city programme and a municipal programme (the latter complementing the Covenant of Mayors), particularly the Plan for the Energy Self-Sufficiency of Municipal Buildings (PAEEM), which aims to save 2,355 tonnes CO₂-eq/year in energy consumption by municipal facilities.


 **Measures to overcome barriers to hiring ESCOs.** In order to analyse in depth the contractual situation of Energy Service Companies (ESCOs), a study has been carried out entitled “Technical assistance to

assess and overcome current technical barriers to hiring ESCOs by Barcelona City Council”.


 **Promoting the regulation and control of buildings as an energy-saving and efficiency strategy.** A “Basic guide on energy efficiency in municipal buildings” was published, describing specific efficiency measures for buildings. A communication protocol was also established to monitor energy consumption in buildings.

 **Installation of new smart street lighting in Barcelona.** In accordance with the new **General Plan for Lighting**  , in 2013 work started on installing new street lighting that is brighter, more efficient and uses new technology. Up to 2015, 15 million euros will have been invested to renew 100 street sections and 2,500 lighting points in the city.

 **Encouraging localised energy generation.** In 2011 a new Environment By-Law was passed making it compulsory to install thermal and photovoltaic solar systems on almost all new and renovated buildings in the city. The Council is also implementing other renewable energy installations at municipal buildings and facilities.

 **DH&C networks that take advantage of residual cold and heat.** Barcelona has Districlima, the first urban network that takes advantage of the heat left over from treating urban solid waste. This network was first set up in 2002 and has been expanded since then, now totalling 13 km with 81 buildings connected. Ecoenergies is another network that takes advantage of cold energy from the gasification of liquefied natural gas at the Enagas plant at Barcelona port. This network is currently 7 km in length.

Future measures

 **Barcelona Energy Self-sufficiency Plan.** This Plan aims to maximise the generation of renewable energy within the city itself, as well as reduce the overall consumption of energy via energy efficiency measures. The Plan’s goal is to increase self-sufficiency, reducing emissions by 20% in 2020 and by 80% in 2050.

Some of the Plan’s measures: promote the refurbishment of buildings in energy terms, encourage self-sufficient, zero energy blocks, foster the electrification of vehicles, encourage new installations of renewable energy sources, install self-sufficient urban elements (rented bicycle sites, beach bars, etc.).



Resilience and climate change adaptation

Barcelona is adapting to the risks and effects of climate change

Resilience and climate change adaptation



Vision of the future

Becoming a city that tackles risks and guaranteeing citizens' quality of life

Current situation

Climate change:
Main impacts ▶



+ 0.5°
by 2020



- 40%
rainfall in summer
X 2 frequency
of downpours
and droughts



sea level
+ 20-60 cm
by 2100

Main challenges ▶



Heatwaves



Urban heat island effect



Drought



Floods



Wildfires



Coastal erosion



Reduction in tourism



Increase in
demand for water



Change in energy
consumption patterns

Lines of work

Governance tools

'Resilience boards (TISU)'
'Situation room'

Guaranteed resource supply

'Desalination plant'
'Energy self-generation'

Flood management

'Rainwater storage tanks'

Planning

'Resilience and climate change adaptation plan'

Protecting the sea front

'Plan to stabilise beaches'



Resilience and climate change adaptation

Barcelona wants to be a city able to proactively tackle its challenges, impacts and crises, overcoming them while learning, getting stronger and guaranteeing its citizens' quality of life.

General context and current situation

Barcelona, like a number of cities in the world, is facing increasing risks from climate change. Cities are highly vulnerable to risks due to the high density of both population and services. It's difficult to quantify the long-term risk but the economic and personal costs of the increase in risks associated with climate change could be very high.

Barcelona is vulnerable to impacts resulting from climate change. The main risks predicted, some of which have already started to be felt, are: rising sea level, with the estimate that 1 metre of beach is lost with each centimetre the Mediterranean rises; rising temperatures, especially in summer, with heatwaves;

changes in the rainfall pattern with more frequent and severe downpours and droughts.

Climate change presents new challenges for the city. Some of these challenges are related to:

- **people's health**, due to the increase in heatwaves which can lead to heart, respiratory and allergic complaints;
- **natural assets and resources**, due to the increase in wildfires and changes in the patterns of demand for water and energy;

→ **the coastline**, due to erosion resulting from strong easterly winds and sea storms;

→ **economic activities**, due to changes in the distribution of tourists to the Mediterranean throughout the year;

→ **waste water infrastructures**, due to the increase in heavy rainfall, overloading the capacity of treatment plants.



Measures taken

Creation of tools to improve governance.

Barcelona City Council has set up a Resilience Department to lead and coordinate projects. In 2009 it also created Urban Resilience Boards (TISU in Catalan) with the collaboration of all parties involved, organised into sector-based work groups in order to reduce any vulnerabilities identified. A Situation Room was also set up as an information management platform, made up of the different agents involved, to jointly analyse data which had not been correlated previously, as well as to contribute new knowledge to improve any decisions taken.

Exchange of knowledge with other cities

through international projects and networks of cities and organisations to share experiences, such as ICLEI with projects such as Cities Adapt and Ramses, UNISDR with the 'Making Cities Resilient' campaign and C40, a city network that's working on resilience and climate change risk assessment.

Preventing the effects on people's health.

The Action Plan to Prevent the Effects of Heatwaves on Health (POCS in Catalan) has been implemented every year since 2004, aiming to predict, as early as possible, any high-risk weather conditions and minimise any negative effects.

Increasing environmentally-friendly services and conserving biodiversity.

The Barcelona Green Infrastructure and Biodiversity Plan 2020 was set up to manage the green infrastructure to define the municipal government's challenges, targets and commitments regarding the natural environment and biodiversity. On the other hand, the shade and cooler temperatures provided by vegetation is used as a means of regulating microclimates and minimising the urban heat island effect. One particularly important aspect of the biodiversity conservation plan is the programme to protect amphibians, one of the most sensitive groups to climate change.

Guaranteeing the supply of water and energy.

With regard to water, some of the measures implemented are: production of the Technical Plan to Maximise Alternative Water Resources 2012-2015, the construction and start-up of the desalination plant and the Municipal Action Plan for the Risk of Drought. With regard to energy: production of the Energy Self-Sufficiency Plan, a commitment to local energy sources via solar energy by-laws and waste treatment and improving energy efficiency with the New Energy Production Plant in Zona Franca.

Flood management and coastal protection.

There's a network of water storage tanks to stop rainwater from running directly into the sea as this is heavily contaminated after running through the city, as well as to prevent flooding. Barcelona also has a Beach Stability Plan whose aim is to protect the sea front and prevent the loss of sand in sea storms.

Future measures

Planning for resilience and climate change adaptation.

Barcelona City Council is currently drawing up this Plan with the aim of involving all agents and improving coordination, systemising a methodology to

identify and assess risks, define measures to improve existing systems, define a resilience monitoring system, raise overall awareness of resilience and climate change, etc.



Mobility and urban transport

Barcelona, for safer, fairer, more sustainable and efficient mobility

Mobility and urban transport



Vision of the future

Becoming a city where mobility is more sustainable with a better quality of life in the districts

Current situation

Daily journeys ▶

7,662,339

Internal journeys

64.6 %

Connecting journeys

35.9 %



Public transport



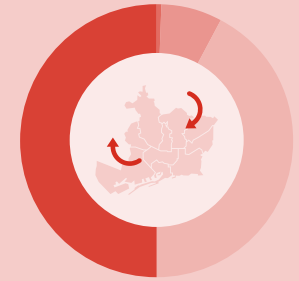
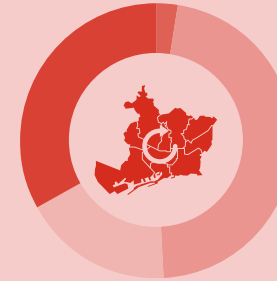
Bicycle



On foot



Private transport



Lines of work

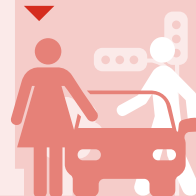
Promoting cycling

'Increasing cycle lanes'
'Improvements for Bicing'



Street pacification

'Widening the area for pedestrians'
'Containment of private vehicles'



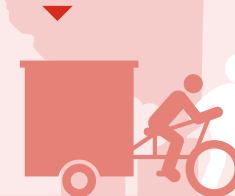
Connectivity and efficiency

'Orthogonal bus network'
'Electrifying mobility'



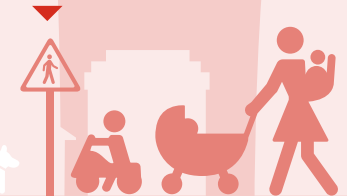
Goods management

'Electric vehicles for the last mile'



Safety

'Road safety plan'





Mobility and urban transport

Barcelona wants to become a city where mobility is more sustainable, where the quality of life is improved in the city's districts, democratising the use of public space and promoting more sustainable forms of movement, especially electric vehicles.


General context and current situation


Transport in Barcelona is currently the main cause of air and noise pollution and also a significant source of energy consumption. The transport industry in Barcelona is responsible for: 37% of the city's GHG emissions, over 50% of the emissions of NO_x and particles, over 80% of the city's noise.

Mobility has gradually decreased in Barcelona over the last few years, both for internal journeys, although there was a slight upswing in 2010 and 2011, and also for connecting journeys, probably related to the economic recession which started in 2007.


Mobility using more sustainable modes has increased over the last few years, without doubt because of the effects of the economic crisis. Specifically, journeys on foot and by bicycle have increased, public transport has remained relatively stable and the use of private vehicles has decreased.


Measures taken

 **Encouraging journeys on foot and by bicycle and public transport.** Various actions have been carried out, such as widening the area for pedestrians, traffic calming, consolidation of school paths, drawing up the Bicycle Promotion Plan, extending the cycle lane and underground networks and making public transport more accessible.

 **New, more efficient orthogonal bus network.** In 2012, Barcelona Council and TMB started to redesign the current bus network based on an orthogonal network of fewer but faster and more efficient lines, as well as making it easier to understand. This new network will have 28 lines (17 vertical, 8 horizontal and 3 diagonal) replacing the current ones, of which 10 have currently been implemented.

 **Making the public transport fleet more environmentally friendly.** TMB has reconverted its fleet of buses to reduce their environmental impact. Some of the technologies incorporated are low emission diesel buses, those running on compressed natural gas, hybrid and electric vehicles.


 **Pilot test for goods distribution via electric tricycles.** A micro-platform has been built in the district of Ciutat Vella, creating a mini-quay for loading and unloading where a fleet of electric tricycles completes the delivery process, along the route known as “the last mile”.


 **Containing private vehicles and reducing accidents.** The aim of municipal policy is to limit the space devoted to roads with measures to calm traffic and reduce accidents (“30 zones” and combining pedestrian and vehicle areas), as well as regulating parking by

implementing “green” metered zones and diversifying the types of parking available (free, free at night, blue zones, for motorbikes, reserved, etc.).

Future measures

 **Infrastructure Master Plan (PDI) of the Metropolitan Region of Barcelona 2011-2020.** Strategic instrument for actions regarding infrastructures, continuing the previous PDI 2001-2010. It consists of five programmes: extension of the train network, deployment of the state railway network, increased connectivity between different modes of transport, road public transport infrastructures, modernisation and improvement of existing railway networks.

 **Urban Mobility Plan 2013-2018 (PMU).** Strategic planning instrument that sets the goals and future lines for mobility. Some of the targets set for 2018 are: reduce the number of serious injuries by more than 20% and the number of deaths by more than 30%, comply with EU parameters regarding NO₂ and PM₁₀ at all stations, increase the average frequency of buses to 6' and improve goods management with logistic micro-platforms and new technologies.

 **Strategy to implement electric vehicles in Barcelona.** Barcelona wishes to encourage the implementation of electric vehicles to improve air quality, reduce noise and energy dependence, help to develop renewable energies, etc. To this end, collaboration is required between all administrations, institutions and companies in the sector to ensure the presence of such vehicles, the possibility to recharge them (there are currently 263 charging points), provide financing, implement suitable mobility policies, etc.



Urban green and biodiversity

Barcelona enjoys and benefits from green spaces

Urban green and biodiversity



Vision of the future
Becoming a city where nature and urban life interact and develop

Current situation

Urban green ▶

18.05 m²
of green space per inhabitant

35.3 %
of Barcelona's municipality is **green space**



Biodiversity ▶



1,172
plant species



299
indigenous animal species

Lines of work

Protecting spaces
'Collserola NP'
'Montjuïc Cliff'

Preserving biodiversity
'Amphibian programme'
'Control of invasive species'

Social and environmental green services and connectivity
'Network of green corridors'
'Vertical gardens'
'Living roofs'

Well-being and enjoyment
'Network of urban allotments'

Raising awareness and involvement of citizens
'Bioblitz'





Urban green and biodiversity

Barcelona sees the city of the future as a city where nature and urban life interact and develop. That's why it wants an ecological infrastructure that provides environmental and social services, conserves and improves biodiversity and takes advantage of all opportunities to provide a place for nature.

General context and current situation

Urban green spaces provide ecological values that are essential for the city such as nature, biodiversity, complexity and connectivity and socio-cultural values such as health, well-being, beauty, countryside, culture and helping social relations.

One of the city's priorities is and has been to develop these environmental and social services for green spaces, protect existing free spaces and extend and connect them whenever possible.

Barcelona has remarkable natural assets. Barcelona has 3,615 hectares of green, accounting for 35.3% of the municipality's area (2013 data). Of the overall amount of green, only 30% is strictly public and

urban while 20% corresponds to private green spaces (acting as a lung for the city and providing environmental benefits but without the public being able to use them) and the remaining 50% is the wooded green area of the municipality of Barcelona that lies within Parc de Collserola. In total there is 18.05 m² of green space per inhabitant.

The city's predominant urban green is modest in size.

Apart from the two large wooded parks (Collserola and Montjuïc), green spaces occupy between 1 and 5 hectares and are located in the middle of the urban development, within reach of citizens. 57% of the green spaces measure less than 1,500 m² and, in general, they are not very interconnected. There are other types of urban green

apart from parks and gardens: squares, allotments, flower beds, ornamental pools and ponds, walls and roofs, etc.


Barcelona has some particularly significant indigenous fauna,

All amphibians, reptiles, mammals (except those considered to be pests) and some birds are considered to be important. The fish species in freshwater have been introduced, however.

Barcelona has a wide diversity of tree species


within the city (200 species) although this is not spontaneous biodiversity but the result of the management model for green spaces. The trees lining the streets are also important, totalling around 161,000 units with 150 different species and cultivars.


Measures taken


 **Conservation of areas in the city.** On the one hand, the Collserola range of hills was declared the Collserola Nature Park in 2010. On the other, the final approval of the amendment to the General Metropolitan Plan of Montjuïc Mountain, prioritising free areas of natural interest and guaranteeing protection of the cliff. This cliff has assets that are highly significant when considered as a whole: landscape, fauna, flora, history, science, social assets, etc.

 **Preserving biodiversity.** Several conservation programmes have been implemented, such as: monitoring and managing urban biodiversity in buildings, the Swallows Project, monitoring the peregrine falcon, preserving the jackdaw, monitoring the city's most


common birds, helping the non-captive fauna at Barcelona Zoo, protecting amphibians and a butterfly garden. Biodiversity conservation guides have also been produced for different natural habitats which include a description of the habitat, its problems and proposed actions, among other elements.

 **Increase in green surface area.** New parks and gardens have been created, such as Parc de les Rieres d'Horta (4 hectares), the "rambla" or promenade resulting from covering the railway line from Riera Blanca to Sants and the future renovation of Plaça de les Glòries. Interior patios or "islands" have also been reclaimed in the Eixample district, as well as implementing a plan to install new vertical gardens on walls in the city.

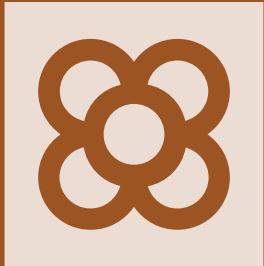
 **Consolidation of the urban allotment network.** Barcelona currently has 329 plots distributed in 14 urban allotments which, in total, represent almost 25,000 m². More than 500 people benefit from these, including the elderly, organisations and the disabled.

 **Awareness-raising campaigns.** To make its citizens more aware of the city's natural areas and biodiversity, the Council publishes guides and other materials, promotes natural areas, environmental education in schools, activities at municipal facilities such as the Fàbrica del Sol and the environmental games centre at Parc de la Ciutadella, etc.

Future measures

 **Planning for nature and biodiversity.** The Barcelona Nature and Biodiversity Plan 2020 is a strategic instrument that defines challenges, goals and commitments regarding the conservation of nature. Some of the measures included are the green corridor

project, the living roofs project, the promotion of green roofs, handling the problems caused by wild boar, the city beehive network to promote urban beekeeping and the Tree Master Plan (PDA).



Sustainable land use

Barcelona, a city that promotes and fosters urban quality

Sustainable land use



Vision of the future
Becoming a metropolis of districts at a human pace

Current situation



102.3 km²
surface area



1,611,822 inhabitants
15,749 inhabitants per km²

! + 50 % of Catalonia's population resides in the Barcelona Metropolitan Area

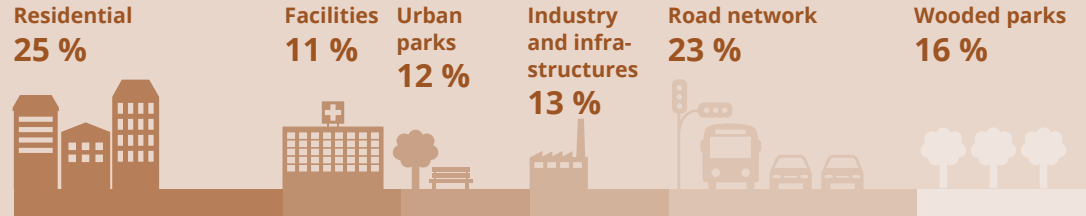
Planning instruments ▶

Barcelona Metropolitan General Plan (PGM)
1976

Barcelona Metropolitan Spatial Plan (PTMB)
2010

Urban Development Master Plan (PDU) -currently being drafted-
2013

Land uses (2013) ▶



Lines of work

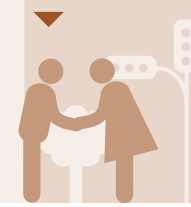


Urban innovation
'Super-blocks'
'BUITS' Plan



Governance

'Urban Habitat'
'Advisory Board for Urban Habitat'
'Public Space Board'



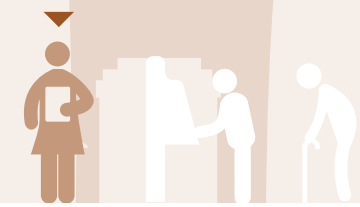
Regeneration 'Micro urban developments'
'Districts Plan' 'Plan to Improve Public Space'



Strategic projects
'Les Glòries'
'La Sagrera'



Planning
'Urban Development Master Plan'





Sustainable land use

Barcelona aims to become a metropolis of districts at a human pace, a city designed for people as its priority, a comfortable city seeking excellence in public space that takes into account the different elements comprising the urban habitat - the human habitat.

General context and current situation

Barcelona has grown over the course of its history and consolidated its position as a major zone in the Mediterranean region. Over 50% of Catalonia's population resides in the Barcelona Metropolitan Area.

The urban planning of the city reflects the different periods of its history, which have turned Barcelona into a diverse, dense and compact city. In 1976 the **Barcelona Metropolitan General Plan (PGM)** still effective today, was passed to correct the deficiencies accumulated over

the years. In 2010 the Catalan government approved the **Metropolitan Spatial Plan of Barcelona (PTMB)** to structure the Barcelona Metropolitan Region as an environmentally sustainable, economically efficient and socially equitable and fair reality.

Measures taken

Improvement of the city's governance. On the one hand, the **Hàbitat Urbà** governance area has been set up to operate across the board, striving to fulfil the aim of turning Barcelona into a smart and self-sufficient city, designed for people and integrating urban planning, environmental and urban services, infrastructures, ITC and housing within the same area. On the other hand, the Advisory Board for Urban Habitat has been created – a collegiate advisory body made up of experts and professionals from the fields involved in work on the urban habitat. Lastly, architecture commissions monitor


the architectural quality of the major projects carried out in the city.


Planning to maintain a compact city. First of all, District Plans are intended for those urban districts and areas with a combination and overlapping of shortcomings in planning, building and well-being that require comprehensive actions. Secondly, the Plan for the Comprehensive Improvement of Barcelona's Public Space 2013-2015 covers actions for wide-ranging renovation in 65 streets and 13 parks. Thirdly, the



installation of vertical gardens on some of the city's buildings, such as in 22@, improves the urban landscape and makes an efficient use of natural energy. Lastly, the ordinance on pavement cafés sets out to improve their quality and environmental sustainability.



Citizen participation. *Hàbitat Urbà* promotes spaces for the main social agents to become involved in conceptualising and implementing projects and plans connected with urban planning, such as the Assessment Commission for the BUIITS Plan.

 **Improvement and revitalisation of the city's public spaces and key symbolic elements.** The BUIITS Plan  covers projects for hitherto unused municipal sites, where there is no intention to build in the short term or the final use has not yet been decided. The new micro urban development projects propose action on deteriorated or unused sites in the city. Lastly, the projecte 22@  is turning 200 hectares of industrial sites in Poblenou into an innovative, productive district providing modern spaces for the strategic concentration of knowledge-intensive activities.


 **Preservation of Montjuïc.** For this purpose the Metropolitan General Plan has been modified related to Montjuïc and a cooperation agreement has been signed to promote a large joint cultural area.





 **Reduction of the environmental and social impact of public space.** The deployment of Barcelona Lighting Master Plan has started, municipal works have been made more environmentally friendly and resilience criteria have been incorporated when planning and managing urban services.


 **Urban transformation.** In the new Marina del Prat Vermell  district the existing uses are being turned into combined uses, making its residential role more compatible with economic activity.


 **Sharing knowledge.** *Hàbitat Urbà* promotes the City Protocol Project  together with other cities, related to the anatomy of the city and its habitat.


Future measures

 **Defining new instruments.** The Metropolitan Urban Development Master Plan will focus more on conversion than urban development, combining regulatory efficiency with a certain degree of flexibility to enable reasonable adaptations to changing situations.

 **Carrying out urban development projects in strategic zones.** Some of the most significant projects are the alterations to Les Glòries , the new La Sagrera , central station and urban centre, the scaling of a new park in Tres Turons and the extension of Passeig de les Aigües .

 **Introduction of five pilot “super-blocks”.** These are urban units based on specific objectives of sustainable mobility, the revitalisation of public space, fostering of biodiversity and urban green space, social cohesion, energy self-sufficiency and citizen participation.

 **Remodelling emblematic aspects of the city.** Some of the more significant projects are the redevelopment of the Pere IV thoroughfare, the “smart” alterations to Passeig de Gràcia, the remodelling of Avinguda Paral·lel, the alterations to Avinguda Diagonal and the works planned for Balmes and Mitre.

 **Improving the range of children's recreation areas.** The Children's Corner Plan establishes the creation of new children's facilities, the renovation of existing play areas and the introduction of innovative items connected with new technologies as well as themed actions.



Local air quality

Cleaner air to guarantee citizens' health in Barcelona

Local air quality

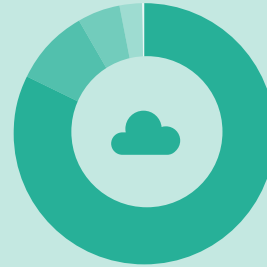


Vision of the future

Improving the quality of the air we breathe in the city

Current situation

Main sources of air pollution generated in Barcelona (NO₂ and PM₁₀) ▶



76.0 % Traffic



2.4 % Port



8.7 % Residential and tertiary



0.2 % Cement mixers and extraction



5.1 % Industry

	NO ₂ (EU annual limit value: 40 µg/m ³)	PM ₁₀ (EU annual limit value: 40 µg/m ³)	PM _{2.5} (EU annual limit value: 25 µg/m ³)	
Urban background stations	✓	✓	✓	
Moderate traffic stations	✓	✓	✓	
Heavy traffic stations	✗	✓	✓	✓ compliance ✗ exceedance

Lines of work

Actions in key areas
 'Mobility' 'Energy' 'Port'
 'Construction'
 'Awareness-raising'

Commitment and planning 'Agreement of the Network of Cities and Towns towards Sustainability for Cleaner Air' 'Barcelona Air Quality Improvement Plan 2011-2015'

Innovation 'Resurfacing with autoclaved aerated concrete or new photocatalytic materials'

Communication and information transparency 'Website for spreading air quality information in the city'

0-emissions mobility within the city
 'Barcelona Urban Mobility Plan 2013-2018'



Local air quality

Barcelona wants to improve the quality of the air we breathe in the city and to guarantee compliance with the levels permitted by the regulations. The city is moving towards energy self-sufficiency and aspires to be as efficient as possible and to reach zero emissions to guarantee the health and quality of life of its citizens.

General context and current situation

Traffic emissions, those that come from large mobility infrastructures (port and airport), residential emissions, and construction emissions dictate the level of air pollution in Barcelona. But air pollution is also caused by emission sources located some distance from the city, so-called regional background pollution. The strategy to improve air quality requires cross-cutting and comprehensive action from all of the sectors involved.


Formal approval of the Air Quality Improvement Plan Horizon 2015 is expected for mid-2014. Nevertheless, in


2013 many of the measures it contains were implemented, mainly affecting the mobility of people and goods, as well as citizens' habits.


Managing aspects related to air quality involves different agents: the Network for Monitoring and Forecasting Air Pollution ⊕, made up of a set of measurement stations distributed throughout Catalonia (Barcelona has 11 stations), the Barcelona Public Health Agency ⊕ and Hàbitat Urbà ⊕.


The air in Barcelona complies with the majority of the pollution parameters ⊕ regulated by state and European standards on the assessment and management of air quality. In 2013, a significant and overall improvement was detected in the levels of the two critical pollutants (PM₁₀ and NO₂) in air quality in Barcelona. The annual limit value for NO₂ is complied with in all moderate traffic stations and urban background stations in the city, being exceeded only in heavy traffic stations (districts of Eixample and Gràcia-Sant Gervasi).




Measures taken

 **Signing the Agreement of Cities and Towns towards Sustainability for Cleaner Air.** The City Council has committed to promoting measures of a structural nature, with a general geographic scope, and coordinating in a responsible way with the different administrations and institutions.


 **Implementation of the Barcelona Air Quality Improvement Plan 2011-2015.** In order to improve air quality and to reach the levels permitted in the regulations, some of the measures implemented include: promotion of electric vehicles, new orthogonal bus


network, greening of municipal vehicles, the Energy Self-Sufficiency Plan, gasification of Barcelona Port, greening of construction, and the new [website](#)  for spreading information on air quality in the city.

 **Programme for the inspection and cleaning of combustion facilities.** Citizens and companies are obliged to comply with the presentation of an annual certificate of inspection and cleaning of combustion facilities (heating, boilers, etc.) that do not operate with natural gas.

 **Promotion of studies on air quality as a basis for defining the measures to be implemented.** Of particular note is the emissions inventory of Barcelona (currently being updated) that allows for a diagnosis of air quality in the city. There are also the studies “Public health benefits from reducing air pollution in the metropolitan area of Barcelona ”, which shows that the improvement of air quality carries clear benefits for health, and “Ecological services provided by urban nature in Barcelona ”, which estimates the amount of air pollutants absorbed by green spaces in the city.



Future measures

 **Implementation of innovative measures to improve air quality.** One measure of note is the study on the efficiency and application of CMA (calcium magnesium acetate) on the roads to reduce the re-suspension of particulates, resurfacing with autoclaved aerated concrete, and the use of new photocatalytic materials to reduce the concentration of NO_x in the air.

 **Construction of a gas supply plant in Barcelona Port.** The boats that use this fuel for their

main or auxiliary engine will benefit from a reduction in port charges.

 **Development of the Barcelona Urban Mobility Plan (PMU) 2013-2018.** This is structured in 5 blocks, each with its own objectives and the respective actions to achieve them: mobility on foot, mobility by bicycle, public transport, urban freight distribution, and private vehicles (cars and motorbikes).

 **New website  for spreading air quality information in the city.** This website will show data in real time and on the basis of the weather forecasts it will make its own forecast of pollution levels for the following 24 to 48 hours. It will also inform on other relevant aspects related to air quality and will include a warnings system for the population.



Acoustic quality

Barcelona, controlling and preventing noise for a more comfortable city

Acoustic quality



Vision of the future
Improving Barcelona's acoustic quality

Current situation

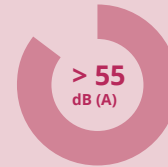
By day ▶



Traffic, is the main source of noise



85.45 %
Population exposed



96 %
compliance of the noise capacity in sections of streets



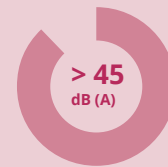
By night ▶



Nightlife, is the main source of noise



87.79 %
Population exposed

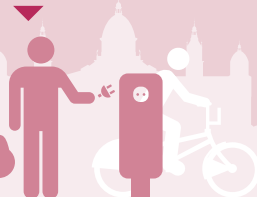


86 %
compliance of the noise capacity in sections of streets



Lines of work

Minimising noise
'Electric vehicle'
'Noise-reducing asphalt'
'Covering railway lines'



Assessment and planning 'Plan to Reduce Noise Pollution in Barcelona 2010-2020'
'Barcelona Strategic Noise Map'



Control and monitoring 'Outdoor sound level meters, noise limiters for night-time venues and concerts'



Raising citizen awareness 'Summer campaigns and pilot tests in nightlife zones'



Education at schools '2015-2016 Education Programme to deal with noise at schools'





Acoustic quality

Barcelona Council is committed to improving the city's noise quality by fostering and implementing priority measures and programmes, cooperation, coordination and information structures enabling the city's general noise pollution to be cut down, above all in the zones where noise limits are exceeded, and protecting quieter zones from any increase in noise levels.

General context and current situation

Barcelona City Council is striving to improve the acoustic quality of the city by carrying out measures structured in the Strategic Noise Map and Plan to Reduce Noise Pollution of the City of Barcelona 2010-2020. Updating Barcelona's Strategic Noise Map [⊕] enables us to make a regular diagnosis of the city and appraise the measures implemented.

The main sources of noise in the city are traffic during the day and nightlife-associated activities at night. Other sources of noise are industry, shopping hubs and railway infrastructures. From the point of view of people's perception of noise, the trend seen over the last few years has continued with the main cause for complaint being noise made by people in public spaces.

Compared with the 2009 map, the number of people exposed to the highest noise levels by day and night has dropped. Most of the city's districts have remained at noise levels similar to the previous edition of the map or have improved their exposure to noise in the last five years. 96% of street sections comply with their noise capacity during the day and 86% comply with this at night.


Measures taken


Assessment and multidisciplinary planning of measures. The Plan to Reduce Noise Pollution of the City of Barcelona 2010-2020 [⊕] is the reference framework for all measures taken by the Council as regards controlling and reducing noise. Barcelona's Strategic Noise Map is an instrument that provides an

overall appraisal of people's exposure to noise produced by different sources in a particular zone and acts as a basis for preparing or updating action plans.


Noise control and monitoring network. Barcelona has different means to control noise in the

city: outdoor sound level meters to carry out studies in particular areas, sensors in public space and limiters or sound recorders which have to be installed in popular public venues with an indoor music noise level above 70 dB(A). Limiters are also installed at municipal open-air concerts and at privately-organised concerts.


 **Programme to supervise and control noise emissions during building work.** Barcelona requires all the companies working in the city to carry out a noise impact study and draw up a noise level plan, with ongoing supervision of the noise emitted.



 **Citizen information and awareness.** The Council is furthering different measures intended to reduce noise levels, such as its summer campaigns in parts of the city where most nightlife is focused and pilot trials to reduce the noise of nightlife in public spaces.

Future measures

 **Update and implementation of the Plan to Reduce Noise Pollution in the City of Barcelona 2010-2020.** Updating the Strategic Noise Map acts as a basis for adjusting and defining new measures to improve noise comfort in addition to the ones already applied and included in the Plan. Many of the areas of work contained in the Plan are already underway, although some still have to be consolidated and others implemented,

such as the 'super-blocks', the incorporation of new technologies and the monitoring network by means of sensors, the commitment to greater citizen involvement (for example the [Govern Obert](#)  platform), and the promotion of electric vehicles, amongst others.

 **Noise education in Barcelona.** The 2015-2016 noise programme seeks to make pupils aware, and have

them act on and participate in improving the sustainable management of their environment by identifying problematic locations with high noise levels at school. Other endeavours furthered by the City Council are the programme for environmental education entitled [How does Barcelona work?](#)  and the educational resource known as the [Sound and noise suitcase](#) .



Waste production and management

Barcelona, a city progressing with less waste

Waste production and management



Vision of the future

Becoming a city that takes advantage of 100% of the waste generated

Current situation

Waste generation ▶

2009
864,758 t



2013
730,285 t



2009
1.46 kg/inhab./day
2013
1.23 kg/inhab./day

Selective collection ▶

2009
32 % 2013
36 %

▶ green points



2009
478,322
visits



2013
741,086
visits



Waste treatment ▶

55.5 %
Mechanical-biological treatment



35.5 %
Material Recovery



5 %
Energy recovery

4 %
Controlled dump

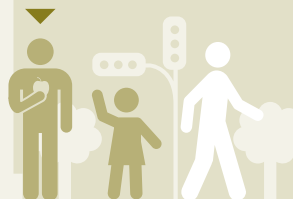


Lines of work

Planning 'Plan to improve street cleaning' 'Waste Prevention Plan for Barcelona 2012-2020'



Rethinking 'E + S (Embolcalls + Sostenibles / Esmorzars + Saludables)' (More Sustainable Wrapping / Healthier Meals)



Reduction 'Taking advantage of food' 'Census of shops selling loose goods'



Reuse 'Renew your clothing'



Recycling 'New cleaning contract' 'Collection of toys at green points'





Waste production and management

Barcelona wants to become a city that takes advantage of 100% of the waste generated. Beyond preventing waste generation, Barcelona wants to build a model of consumption and development with the lowest possible ecological footprint and to move towards a circular economy.

General context and current situation

Barcelona City Council is responsible for cleaning public space and managing the different types of municipal waste produced by the city ⊕. The Council can handle the collection and transport of different waste fractions and even the installation of treatment on its own account or delegate this to private companies or social organisations.

In view of Barcelona's diverse uses and urban structure, different types of collection are implemented with the aim of ensuring this is effective

and efficient: household, commercial, markets and other collections. As a complement to this the Council provides citizens with **Green points** ⊕, a service to collect bulky items (furniture and junk) and clothing.

There are different treatments for different fractions of selectively collected waste (organic material, paper-cardboard, glass, bulky items and residual waste): elimination, recycling and processing (mechanical-biological processing or energy recovery).


In the last five years the waste collected in the city has dropped by 16% to 730,285 tonnes in 2013. The rate of waste generation per person has also fallen, reaching 1.23 kg/person/day partly due to the impact of the economic crisis. Selective collection as compared with the total amount of waste dropped to 36.2% in 2013, 3.3% lower than in 2010, when organic material started to be collected from the city as a whole and the number of green points was extended. The selective collection of waste has become an established habit for citizens.

Measures taken


Implementation of the Municipal Waste Prevention Plan 2012-2020 ⊕. The target for 2018 is to reduce the generation of waste per capita by 10% and to keep to this amount until 2020, reaching a rate of 1,386



kg/inhab./day. Some of the measures taken to improve the prevention of each fraction involve reducing food wastage, fostering the reuse of cava bottles, lengthening the useful life of items, reducing drinks packaging,

promoting the reuse of books and encouraging the selective collection of clothing and footwear and their reuse.


 **Encouraging selective collection.** The cleaning contract has achieved its aim of improving the collection service, increasing the number of collection points by 37%. Selective collection has been extended to shops and large generators and the selective collection of organic material has been consolidated.


 **Starting up the Plan to Improve Street Cleaning** . The first phase of the Plan aimed to improve


the city's cleaning and to convey to citizens the message that cleaning the city is everyone's responsibility. The second phase of the Plan, begun in 2013, places the emphasis on four aspects related to the cleaning service: promoting the initiative entitled "Giving the district a thorough clean on Saturdays "; cleaning up stains and chewing gum, with incentives for the collection of excrement and cleaning the shutters of shops.

 **Awareness-raising campaigns.** Some of the educational measures promoted intended for schools are the E + S Project (More Sustainable Wrapping/ Healthier Meals), "Eating it all up" and "Let's make compost and learn". Some of the measures aimed at citizens in general are the "Civic conduct has its reward" scheme and the creation of the Network of Metropolitan Composting Units .

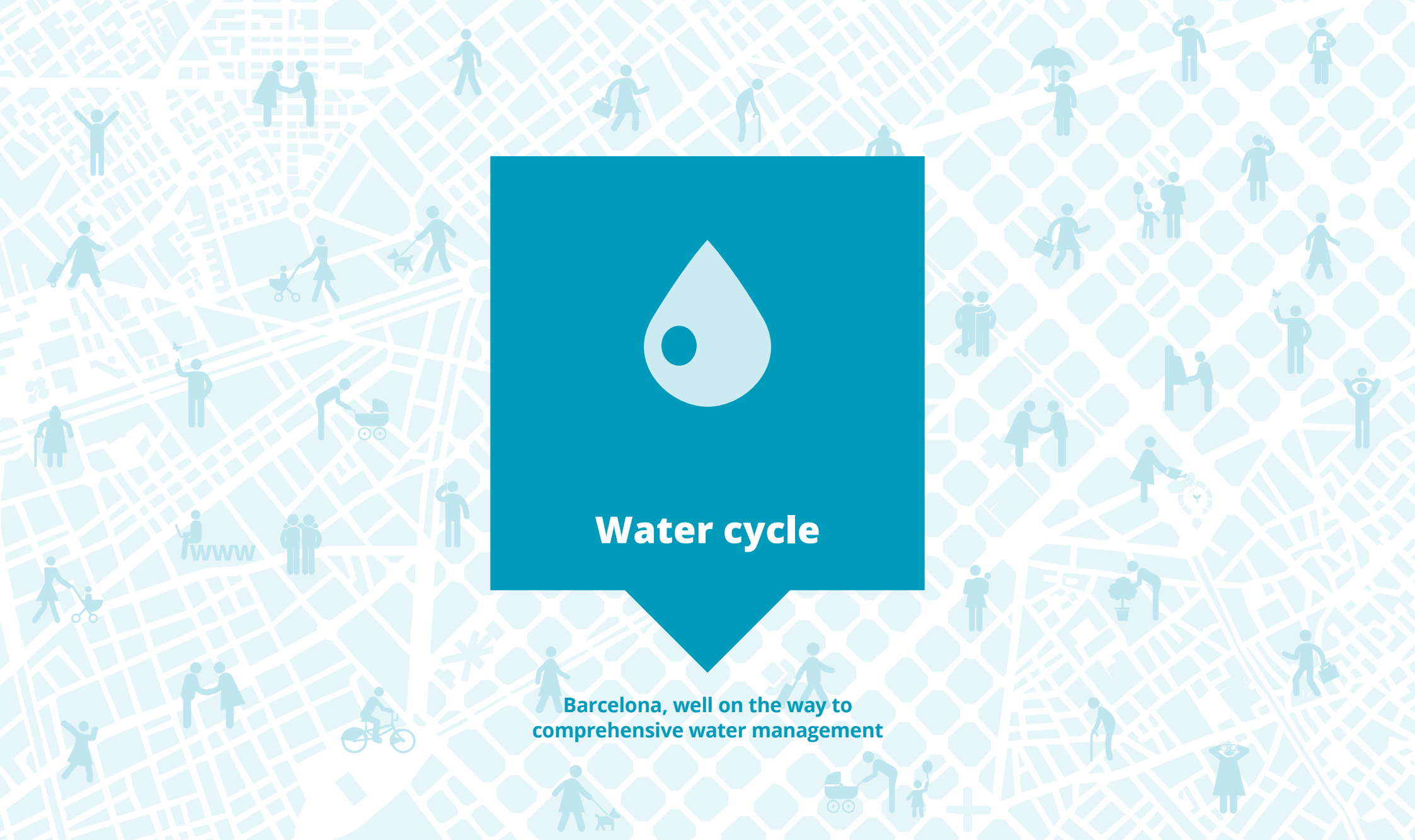
Future measures

 **Continued efforts to minimise waste generation.** To this end activities, programmes and projects will be carried out including the promotion of virtual exchange networks, the consolidation of toy collection at green points and the preparation of a database of Barcelona shops that sell household consumer goods in a loose format.

 **Making municipal markets aware to recycle more and better.** The aim of the campaign is to improve the collection of organic waste at municipal markets through awareness-raising and education.

 **Preparing the new cleaning contract with greater environmental commitment.** The intention

is to reduce noise pollution and minimise the emission of local contaminants. It will seek the maximum electrification of the fleet, new cleaning processes for street cleaning and collection to move towards a circular economic model and foster the protection of people's health and the environment, as well as aspects related to the treatment of data and information transparency.



Water cycle

Barcelona, well on the way to comprehensive water management

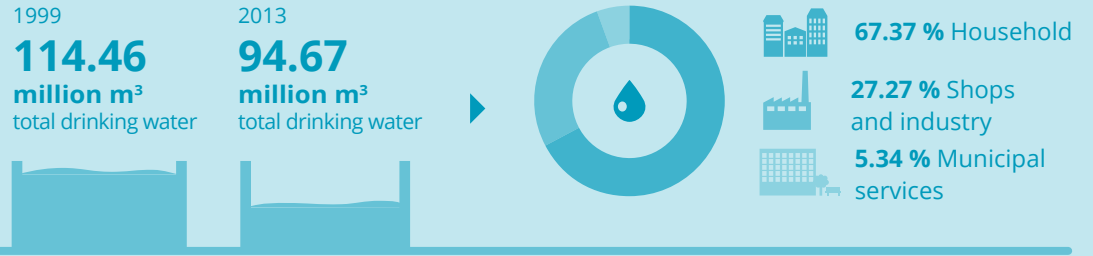
Water cycle



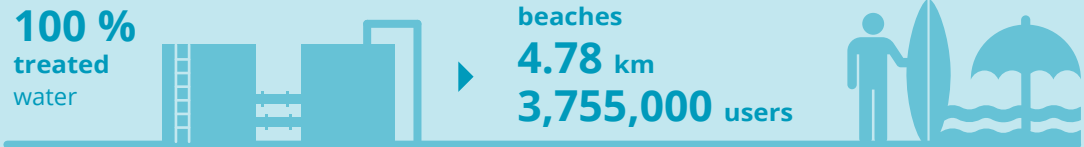
Vision of the future
Protecting water as a basic vital resource

Current situation

Water consumption ▶



Treatment ▶



Lines of work

Quality 'Checks on drinking water'
'Management of bathing water'

Savings and efficiency 'Taking advantage of alternative resources'
'Savings in management of green areas, cleaning and sewers'

Awareness-raising 'Fostering water savings'
'Fonts Bcn' app

New management models 'Barcelona Cicle de l'Aigua, SA (BCASA)'

Flood management 'Remote control and urban drainage'





Water cycle

Barcelona protects its water as a basic vital resource. That's why it's a priority issue for the city to ensure comprehensive water cycle management, taking into account the resources, demand, inhabitants and impact of human infrastructures.

General context and current situation

Barcelona City Council makes a great effort to protect and improve the environment, and specifically water, as an essential factor. That's why the Council has set up the *Barcelona Cicle de l'Aigua, SA (BCASA)* , company, to manage and take measures involving the water cycle, beaches, coastline and environment.

Water supply sources come mainly from the surface. The water comes from the rivers Ter and Llobregat. Underground resources are increasingly being used, currently 1.3 million m³ per year. Reused water comes from treatment plants with a potential volume of 3.25 m³/s, and the El Llobregat desalination plant can provide 60 hm³/year.


The consumption of mains drinking water in Barcelona in 2013 was 94.67 million m³, 19.79 million m³ less than in 1999, representing a consumption per inhabitant of 108.42 litres a day. The household sector made up 67.37% of the consumption, shopping and industry 27.27% and municipal services 5.34%.


Today's sewer system is the result of different plans that have gradually been developed. Now this is a unitary or combined network which carries waste water and rainwater through the same channels. Roughly 145 hm³ of water a year flows through the network, which covers 1,833 kilometres, serving the 1,611,822 inhabitants of the city (2013) and its shopping and industrial establishments.

Barcelona treats 100% of its waste water. The Besòs treatment plant has a treatment capacity of 525,000 m³/day and the Prat de Llobregat treatment plant has a treatment capacity of 315,000 m³/day. Both plants generate energy using the heat from the resulting sludge through a cogeneration plant.


Barcelona's beaches, extending over 4.78 kilometres, are visited all year round thanks to the city's characteristically good weather although the most intensive use is in spring and summer. In 2013 they received 3,755,000 visitors from May to September.


Measures taken

 **Technical Plan to Take Advantage of Barcelona's Alternative Resources (2013).** This identifies the existing water resources, analyses what uses and needs can be met, estimates the potential demand and determines which infrastructures are required to take advantage of such resources. The Plan sets the total potentially exploitable volume at 16.6 hm³/year, including groundwater, regenerated water from treatment plants and underground water.


 **Water savings in municipal uses** with measures to gradually reduce consumption at municipal buildings, such as the installation of water-saving mechanisms, dry urinals, etc. It also manages green space efficiently with control of leaks, the use of groundwater, automation of watering, etc. Non-drinking water is used to clean streets and drains and for ornamental fountains and ponds. These fountains


also have recirculation systems and physical-chemical or biological treatment systems, and the 1,645 public drinking fountains providing water for passers-by are fitted with time-controlled taps and flow regulation devices.

 **Quality control of drinking water.** Since 2003 the Public Health Agency (ASPB) has taken on the responsibility for public health in Barcelona. It is in charge of the supervision of the Barcelona Metropolitan Area and Aigües de Barcelona, as the body that manages supply, supervises and disinfects public fountains, oversees the conditions of the water supplied, carries out controls at the consumer's tap, etc.


 **Raising awareness to encourage water savings and enhancing the value of Barcelona's fountains** through the water cycle website, informative


material, exhibitions, the *Camins d'aigua*  scheme and the free mobile application *Fonts BCN* .


 **Improving drainage management.** On the one hand, through a network of 13 underground rainfall water retention tanks to prevent flooding with a storage capacity of 454,180 m³; on the other, with a remote control system that gathers, stores and supplies data in real time and controls the network mechanisms (sluice gates, valves, pumps).

 **Increasing the permeability of urban space** through sustainable urban drainage techniques (TEDUS) implemented in newly developed zones and by promoting permeable paving and creating water reservoirs and semi-natural wetlands and drainage areas.


Future measures

 **New model of management for efficient drainage cleaning,** for assigning resources, improving maintenance tasks and increasing data on the network to improve planning and repair work. Sensors will be incorporated, as well as taking part in an international project for the use of robots for inspection work, monitoring and taking samples from sewers.

 **New model of management for public and ornamental fountains** to help improve environmental quality. Naturalised fountains will be managed in such a way as to reduce the consumption of chemicals, also increasing the sustainability of ponds.

 **Implementation of the Technical Plan for Alternative Water Resources,** extending the network of groundwater resources to meet municipal requirements

(with a maximum of 4.02 hm³/year) and non-municipal demand (which could reach 2.49 hm³/year).

 **Barcelona Integrated Coastal Zone Management Programme,** whose main priorities are to protect bathers' health, identify potential sources of contamination, increase and improve user information and provide emergency plans.



Municipal greening and the green economy

**Barcelona City Council, an
environmental benchmark for the city**

Municipal greening and the green economy



Vision of the future

Leading the change towards a more sustainable model by its own example

Current situation

Tourism and mobility ▶

'Biosphere World Class Destination' Certification

Greening of the fleet of vehicles used in the cleaning and waste collection contract



Procurement ▶

100 % of municipal contracts contain compulsory environmental criteria



100 % of municipal nursery schools provide organically farmed food



Environmental products and services ▶

70 % of the paper consumed is recycled



78 % of the wood consumed has some sustainable management certification

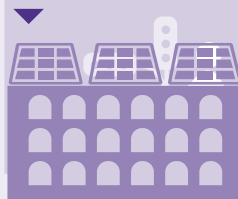


Lines of work

Greening of contracts and procurement 'New Government Measure' 'New Mayor's Office Ordinance'



Efficient management of resources and facilities 'Energy monitoring and savings in municipal buildings'



Sectoral planning 'The Prevention, Security and Mobility Management's Strategic Sustainability Plan'



Networking and exchanging practices 'Smart-spp' 'Procura plus'



Training and awareness-raising of workers 'Do things at the Council as you would at home' campaign





Municipal greening and the green economy

Barcelona City Council aims to lead the way towards a more sustainable model by its own example.

There's a firm municipal commitment to sustainability and local and global self-sufficiency in order to reduce the environmental and social impact caused by the municipal organisation.

General context and current situation

The City Council, as a signatory of the Citizens' Commitment to Sustainability, has undertaken the + Sustainable Council programme (A+S programme ⊕)

which is led by Hàbitat Urbà and works across sectors with the other municipal areas, districts and institutions to improve the environmental and social sustainability of

everyday operations of municipal services and facilities. As part of the commitment to sustainability, municipal procurement has been environmentally enhanced. For example, 100% municipal contracts incorporate compulsory environmental criteria and all the paper used at the Council's municipal facilities has an

environmental certification. Four municipal bodies with over 10,000 workers involved are certified to ISO 14001 environmental management standard.

Measures taken



Greening of public contracts and the procurement of products and services. In 2013 a new Government Measure on responsible procurement was passed, as well as the Mayor's Office Ordinance on responsible procurement with social and environmental criteria. Over the last few years the Council has also made its offices more environmentally friendly, incorporating greening in the schedule of conditions for cleaning and waste collection from municipal premises, introducing more sustainable, supportive and healthy products at

municipal premises and service (nursery schools and catering), furthering the responsible procurement of work clothing and wood products and greening municipal works, the maintenance of parks and gardens and public events held.





Advancement of efficient management in the use of resources for municipal purposes. Measures have been taken for energy savings and efficiency, savings in reuse of water and to make the mobility


generated more environmentally friendly, through two approaches: greening of the council's own fleet of vehicles and those of service contracts and encouraging sustainable internal mobility.




Drafting the Strategic Sustainability Plan 2013-2022 by the Management for Prevention, Security and Mobility with the aim of moving towards sustainable development in the different areas of its work on a gradual, cross-sector and participative basis.


 **Making the Council 'smart'.** The City Council is a pioneer in developing innovation at the service of technology and is heading towards becoming a smart city.


 **Participation, joint responsibility and training for all agents involved.** The involvement of all the agents involved in the greening strategy is

vital for the success of the A+S Programme. Training has been fostered to accomplish the cultural change towards sustainability along with collaboration in the publishing of environmental education guides  and other publications and materials for raising people's awareness.

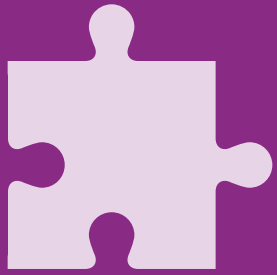
Future measures

 **Review of the A+S Programme's strategic objectives to align this with the new Commitment.** The new objectives will be implemented via actions in the following strategic fields: communication, training and awareness-raising, support tools, observatory, working as a network, continuous improvement and consultancy, and differentiation of three levels depending on the degree of involvement.

 **Implementation of the Responsible Procurement Ordinance.** This will define specific criteria for different groups of products and services, in coordination with the different areas in charge.

 **Definition of the Strategic Plan entitled 'More Sustainable Urban Habitat 2014-2022'.** This seeks to guarantee sustainability in the body's internal management, in order to head towards sustainable development in the different areas of its activity on a gradual, cross-sector and participative basis.

 **Implementation of the Environmental Quality Label for cultural facilities.** Five culture facilities, the City's Historic Archive, the Frederic Marès Museum, the Arús Public Library, the Born Cultural Centre and the HUB Design Centre, are in the process of obtaining the environmental quality guarantee label in the category of cultural facilities.



Joint responsibility

In Barcelona, everyone's involved in sustainability

Joint responsibility



Vision of the future

Becoming a fairer, more sustainable, more prosperous and more self-sufficient city through a shared project

Current situation

Reference framework ▶

Citizen Commitment to Sustainability 2012-2022



298 organisations, businesses and institutions



332 educational centres from the *Escoles + Sostenibles* (More Sustainable Schools) programme



Actors ▶

City Council
30 lines of action for internal greening (2020)



Organisations and Businesses
160 organisations and Businesses have made their sustainability actions public



Schools
Dubai International Award supported by the United Nations (2010)



Citizens
Services and resources through **6 facilities**



New tool ▶



Barcelona + Sostenible (More Sustainable Barcelona) map

A collaborative tool with interesting sustainability resources, experiences and information for citizens

Lines of work

Involving schools
'Let's make compost and learn' 'Come to the Parks'



Joint initiatives and networking 'Let's Network!' 'Sector-based networking'



Monitoring and evaluation 'Definition of new sustainable development indicators in the city'



Citizen education and action 'La Fàbrica del Sol' (The Sun Factory) 'How Barcelona works'



Promoting participation 'Conventions for Commitment signatories' 'New Citizen Council for Sustainability'





Joint responsibility

Barcelona wants to become a fairer, more sustainable, more prosperous and more self-sufficient city through a project shared by different entities (organisations, businesses, educational centres and institutions) and citizens that want to contribute to the city's improvement.


General context and current situation

Barcelona's contribution to sustainability can be seen in the Citizen Commitment to Sustainability 2012-2022 ⊕, renewed in 2012 after an extensive participative process (previous Citizen Commitment to Sustainability 2002-2012 – Barcelona's Agenda 21). In December 2012, the Commitment was renewed by 298 organisations, businesses and institutions, which together with the 332 educational centres from the *Escoles + Sostenibles* programme added up to 619 network members.

Barcelona + Sostenible, Barcelona's Local Agenda 21 programme. Barcelona's Local Agenda 21 programmes: *Escoles + Sostenibles* ⊕ to facilitate the involvement of educational centres, *Entitats i Empreses + Sostenibles* ⊕ (More Sustainable Organisations and Businesses), *Ajuntament + Sostenible* ⊕ (More Sustainable City Council) to drive internal municipal action and *Ciudadania + Sostenible* (More Sustainable Citizens), offering services and resources to non-

organised citizens through different facilities: *La Fàbrica del Sol* ⊕, *The Beach Centre* ⊕, *Sea space* ⊕, Environmental leisure area in the *Ciudadella Park* ⊕, *The Laberint Training Centre* ⊕, *Environmental Education Documentation Service* ⊕.

Measures taken

 **Renewal of the Citizen Commitment to Sustainability 2012-2022** to incorporate new types of awareness and to update it with pending issues and challenges emerging in accordance with the spirit of Rio+20. The image and discourse of the Agenda 21 brand was also updated; it is now 'Barcelona + Sostenible'.

 **Boosting the network of signatories and joint initiatives** through different activities coordinated by the Barcelona + Sostenible Technical Secretariat (customised advice, training days, working sessions, etc.) and through the promotion of networking between different Commitment signatories, materialised in projects like the *Make the Most of Food Platform* ⊕, the *Renova*

programme, the *Participative Energy Plan (PEP)* ⊕ or the group in charge of the *Barcelona + Sostenible Map*.

 **Promoting real projects for transformation of the school community's environment** through the *Escoles + Sostenibles* programme, where students and teachers can analyse the conflicts in their closest

surroundings, consider alternative perspectives, contribute to solving the problems identified and transform this process of analysis and action into an educational resource. In the programme activities are carried out to improve sustainability education in schools and their environment, like: [Come to the Parks](#) or [Eating it all up](#).

Development of activities for citizens to strengthen sustainability culture and to contribute to the creation of new values, attitudes and behaviour: [Urban allotments](#), [How Barcelona works](#), [Music in the Parks](#), and [Renew your clothing](#), among others.

Continuity of the participative process with the celebration of the second and third conventions for Commitment signatories, the beginning of sector-based networking projects and collaborative initiatives between the City Council and other organisations like, for example, the [Barcelona Sustainable Tourism](#) programme.

Future measures

Deployment of new programmes. The *Barcelona + Sostenible* programme for trade will offer practical resources and promotion through specifically designed channels. The city's environmental education programme will seek out joint responsibility and motivation among citizens to live with sustainability values.

Consolidation of networking with offers and demands, exchanges, collaborations and joint projects, like the working session [Let's Network!](#) or participation in the Barcelona super-blocks programme.

Creation of the new Citizen Council for Sustainability in which most members will be Commitment signatories, chosen by the organisations of their sector.

Definition of new monitoring indicators, which should respond to the emerging challenges considered in the new Commitment.

Launch of the *Barcelona + Sostenible* Map, a collaborative tool that will gather sustainability initiatives, resources, experiences and information of interest to citizens. The map will be the city's contribution to the international initiative [Open Green Maps](#), in which more than 850 cities from 65 countries participate.



Smart city

Barcelona, a smart city designed for its citizens

Smart city



Vision of the future

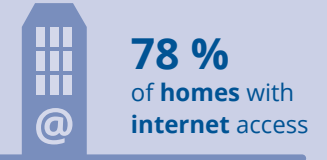
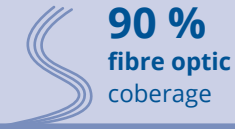
Using the best solutions to improve the quality of life of Barcelona's citizens

Current situation

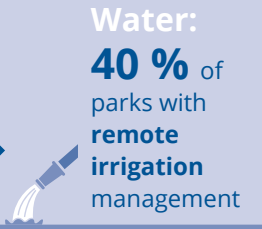
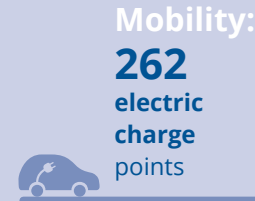
Internacional ranking ▶



The state of ICTs ▶



Some of the milestones reached ▶



Lines of work

Collaborative work for digital fabrication
'Fab Lab'

Governance and transparency
'Barcelona GO'
'e-Administration'
'OpendataBCN'

Mobile solutions
'BCN in your pocket'

Sensors platform
'Sentilo'

Transformation of the city
'Self-sufficient blocks'
'Electric vehicles'





Smart city

A city that uses the best solutions to provide a better quality of life for its citizens. To achieve this it uses the most efficient systems, optimises services management, applies innovative solutions and makes the most of its citizens' talent. Advancing towards the smart city concept can significantly improve the city's habitability.

General context and current situation

Barcelona, on the road to becoming a smart city to improve the quality of life of its citizens, must establish links between systems, infrastructure and technology, which provide us with information and people, who are the engine and the soul of the city. This is a basic element for the success of Barcelona's consolidation as a smart city. Technology, on its own, would give rise to a digital city, but not a smart city.

Barcelona is transforming itself to become a smart city. It is building its own solid structure, for citizens and through networks, where the former can collaborate with businesses and institutions. It has already managed to place itself among the top 10 in international rankings ⊕ . Currently (2013), it is considered to be the 1st smart city in Spain, the 4th in Europe and the 10th in the world.

Technology deployment has improved. Wi-Fi and fibre optic coverage in the city have increased in recent

years. In 2013, there are 721 Wi-Fi access points and FTTH coverage for 90% of the city. The number of sensors is at 100 and the plan for 2014 is to increase this number to 2,500.

The take-up of ICTs in homes in Barcelona is very advanced. In 2013, 97% of Barcelona's citizens use a mobile phone, 86% use a computer and 85% use internet (and 78% of homes have internet access).


Measures taken

i Applying a new governance model. The City Council has implemented e-Administration to make processes more accessible, efficient, effective and transparent. It has also launched Barcelona Go to improve transparency and participation and OpenDataBCN, making data available to everyone.


w Innovating with new technologies. Projects have been developed for mobile communications use like Barcelona Contactless, for carrying out simple actions merely by bringing a mobile phone device into close proximity with another device, Apps4Bcn, a portal that gathers more than 653 recommended apps for

the city, or MobileID, an authentication method that allows access to the virtual citizen folder. Also worth highlighting is Barcelona's free programming sensors platform, 'Sentilo', to which any city or business can contribute new code to connect a new type of sensor or to incorporate new functionalities.

Future measures

 **Deploying the smart city strategy.** The city of Barcelona aims to advance towards the smart concept and to work in accordance with the principles of a smart city. The strategy includes various programmes: integrating the city's different fibre optic networks, extracting smart data, implementing the Lighting Master Plan (smart lighting), creating self-sufficient blocks, using

remote irrigation management, boosting the use of electric vehicles, promoting smart citizens, etc.

 **Collaboration between the City Council and other organisations through the *Barcelona + Sostenible Map*.** This is an interactive virtual map that brings together important socio-environmental

initiatives in the city, from environmental infrastructure and facilities to havens for flora and fauna, stores with local products and businesses with added environmental value. The map is constantly enhanced with contributions from organisations and citizens from different districts. The map currently contains 6,400 geo-located points.

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