

SESSION:
**Creating a Blueprint for a Carbon Neutral City to
Tackle Climate Change**

Portugal's Green Cities: Lisbon & Guimarães - Carbon Neutrality Examples for Climate Action

Pimenta Machado
Vice-President (APA)

iStock
Credit: Sakorn Sukkasemsakorn (adapted)



Portugal in the world



Portugal in Europe





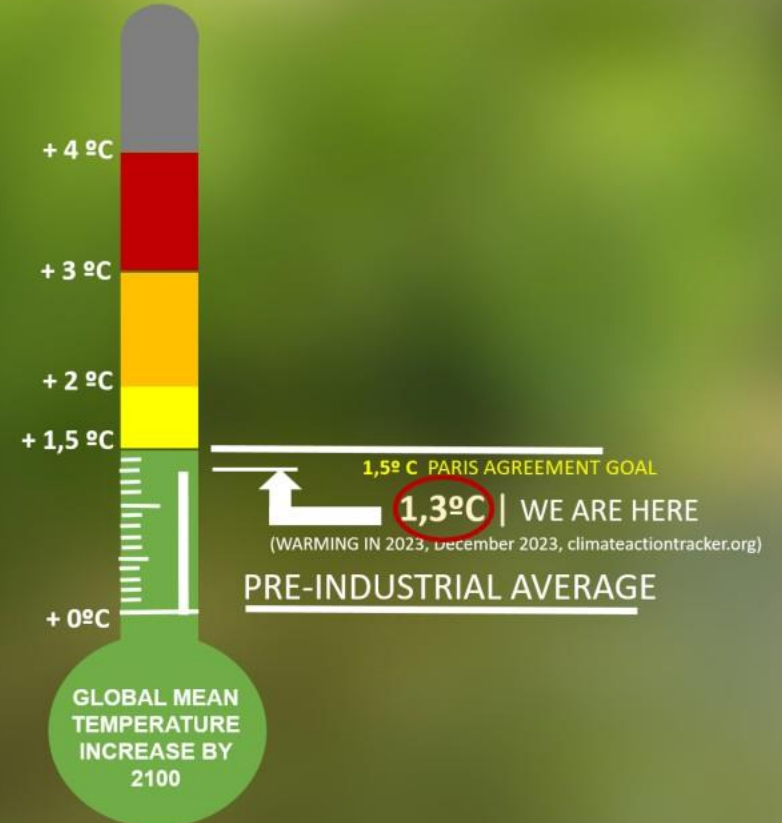
Climate change - Impacts

What do we (already) know?

- The planet has already warmed by **1.3 degrees Celsius**
(it cannot warm more than 2, ideally no more than 1.5)
- **Population and economies growing** >> increase in **greenhouse gas emissions**
- **Action, mitigation, and adaptation** required!

Climate crisis "has opened the gates of hell," says UN chief

Despite the multiplication and intensification of extreme weather events, greenhouse gas emissions continue to rise.



Climate change - Impacts

Last 20 years

RUNOFF

REDUCED
20-30%

EXTREME WEATHER EVENTS

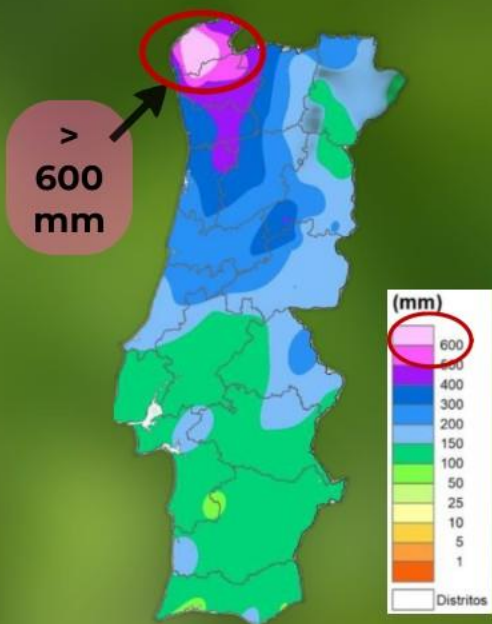


TEMPERATURE RISE

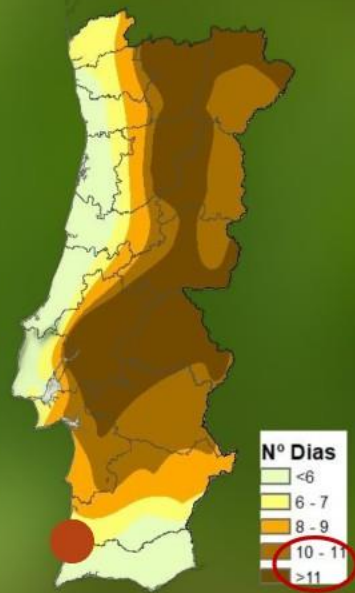


Total precipitation (mm)

Heat waves (days)



OCTOBER 2023



JULY 2022

Record high temperature for January 2024

ALJEZUR (ALGARVE)
Record of 26.3°C on 01/25/2024

Climate change - Impacts

Last 20 years

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EXTREME WEATHER EVENTS



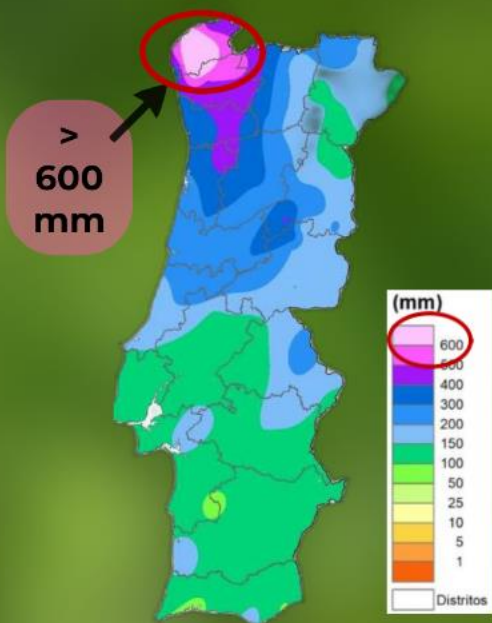
TEMPERATURE RISE



DROUGHT AND SCARCITY



Total precipitation (mm)



OCTOBER 2023

Heat waves (days)

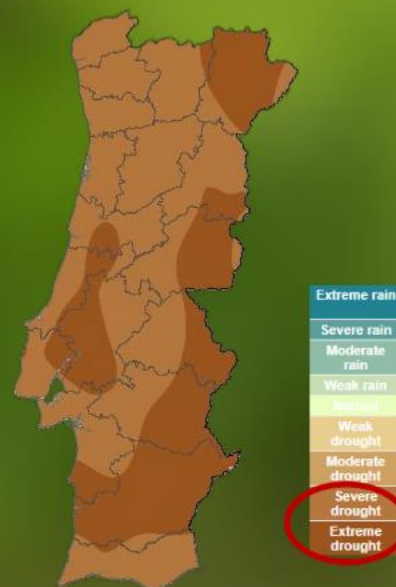


JULY 2022

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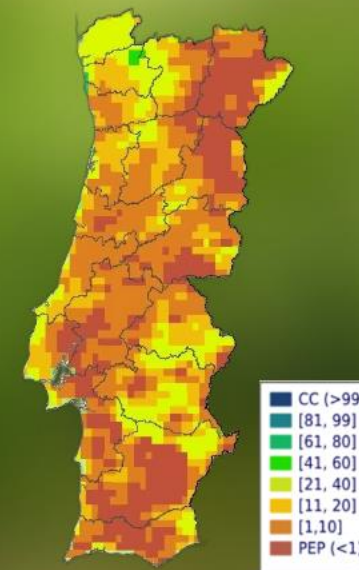
ALJEZUR (ALGARVE)
Record of 26.3°C on 01/25/2024

Meteorological drought



AUGUST 2022

soil moisture index (SMI) (%)



WEI+ * (%)



One country, two realities



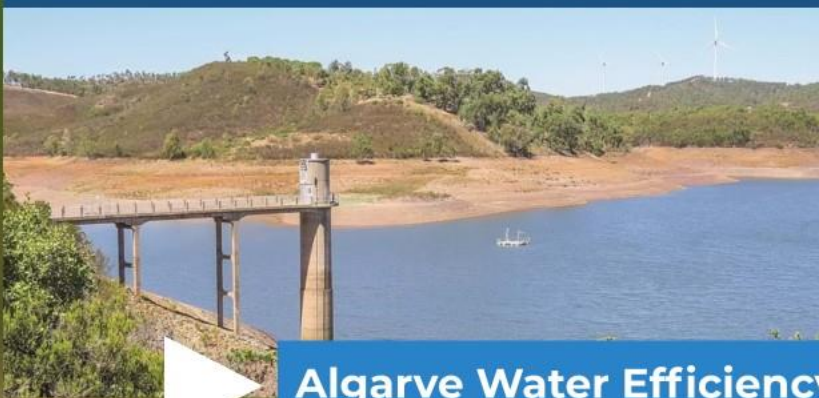
MONDEGO RIVER



Mondego Floods (2019)



Drought Algarve (2019/24)



Algarve Water Efficiency Plan



Mainland Portugal

coastal

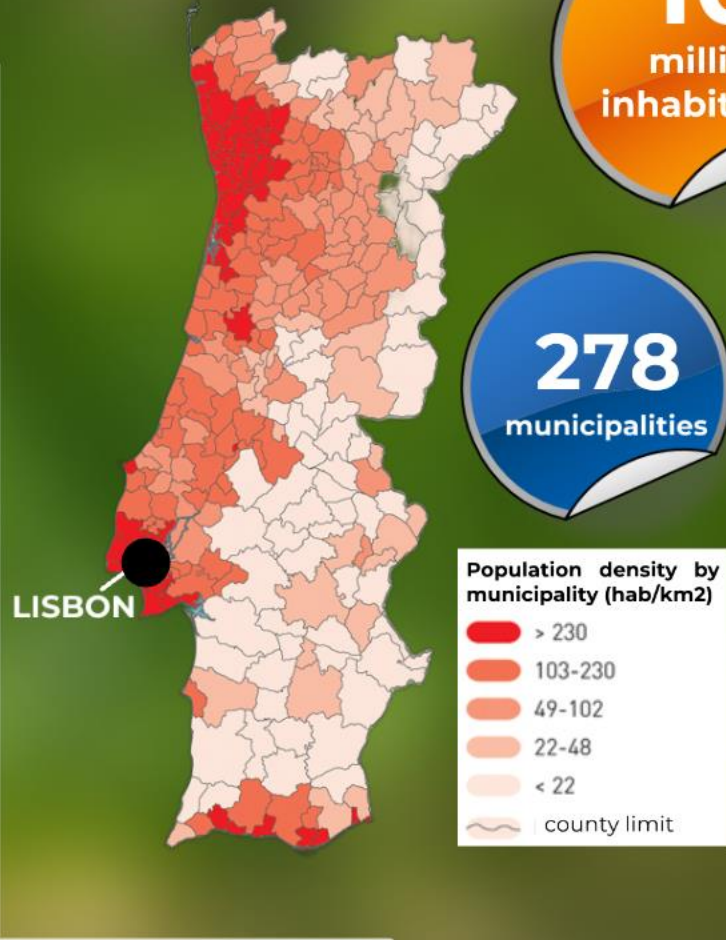
987 km
length of
coast

75%
population

85%
GDP*

*Gross Domestic Product

26 %
occupation
with
buildings
urban, tourist and
industrial



10
million
inhabitants

278
municipalities



São Bartolomeu do Mar (Esposende)

180 km
coastline in
erosion (20%)

12,2 km²
territory loss

(approximately 1700
football fields)

LISBON



São Bartolomeu do Mar (Esposende)



Portugal and its commitment to **climate action**

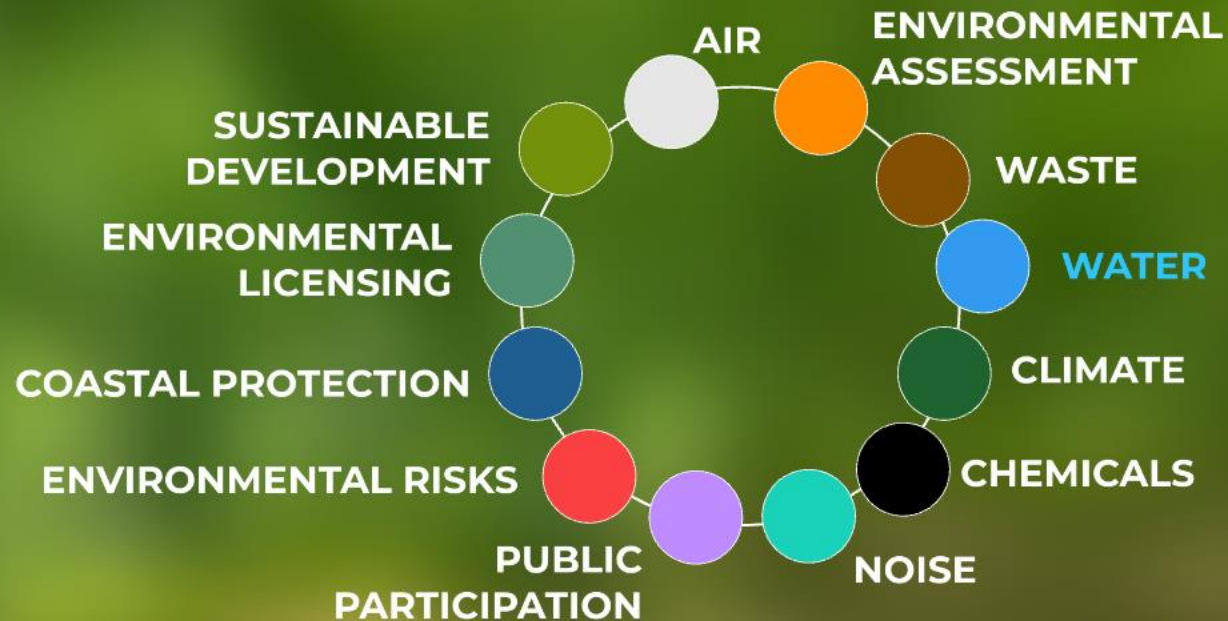
PORTUGUESE ENVIRONMENT AGENCY (APA)



- responsible for the **implementation of environmental policies** in Portugal
- contribute to a **high level of environmental protection and valorization**
- develops and implements **climate change mitigation and adaptation strategies**, aiming to **achieve the GHG reduction targets**



Main areas of activity



(5 Water Basin Districts)

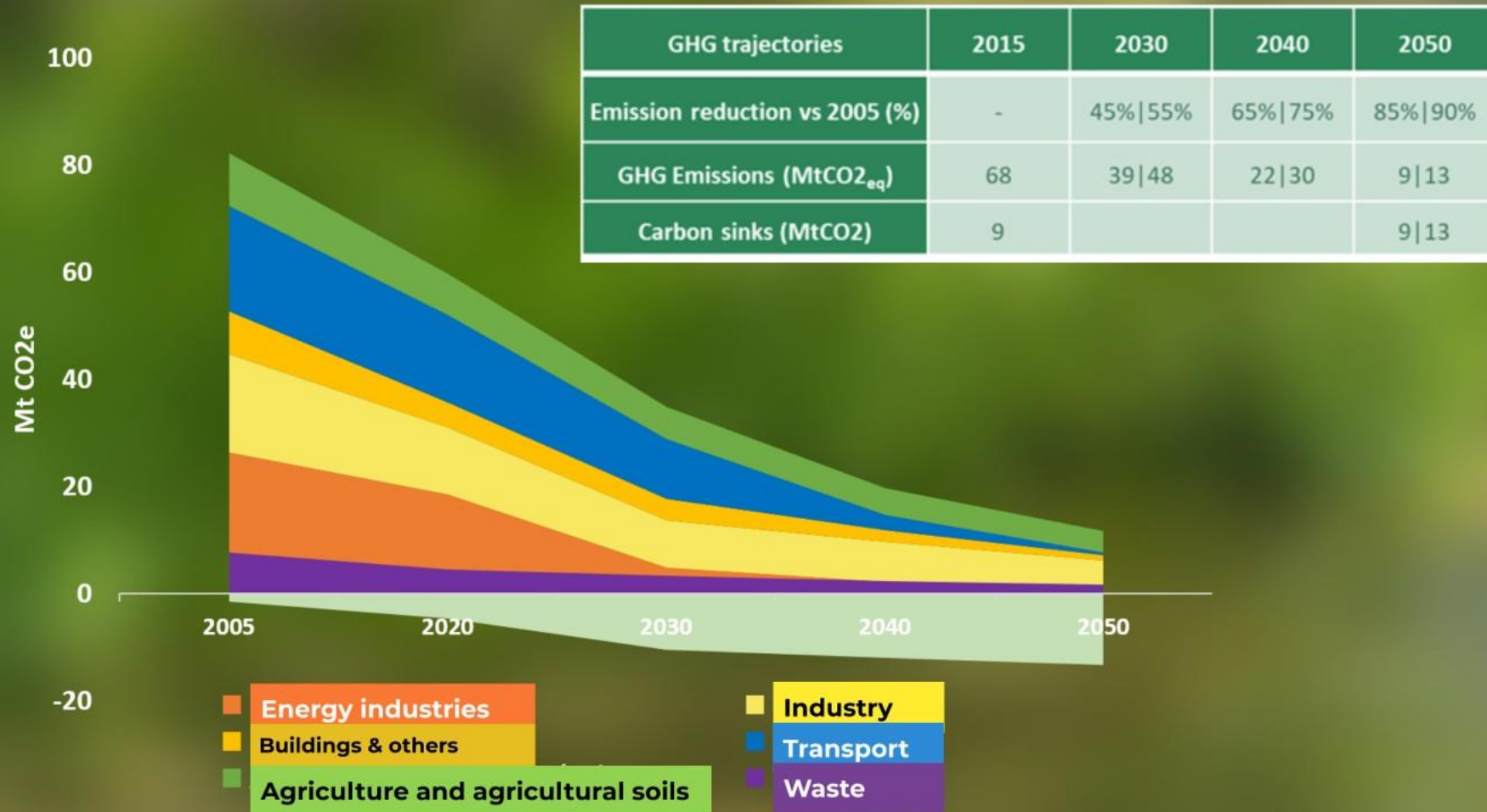
Carbon Neutrality trajectory



RNC2050
Roteiro para a Neutralidade Carbônica

Climate Change Mitigation - Key targets, objectives and strategies

Carbon Neutrality Roadmap 2050

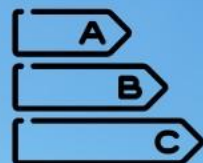


National Energy and Climate Plan (NECP) 2030 | GOALS



GHG EMISSIONS

-45 % -55%



**ENERGY
EFFICIENCY**

35%



RENEWABLE

47%



**RENEWABLE IN
TRANSPORT**

20%



**ELECTRICAL
INTERCONNECTIONS**

15%

SOURCE: portugalenergia.pt

Reduce energy dependency to 65% by 2030

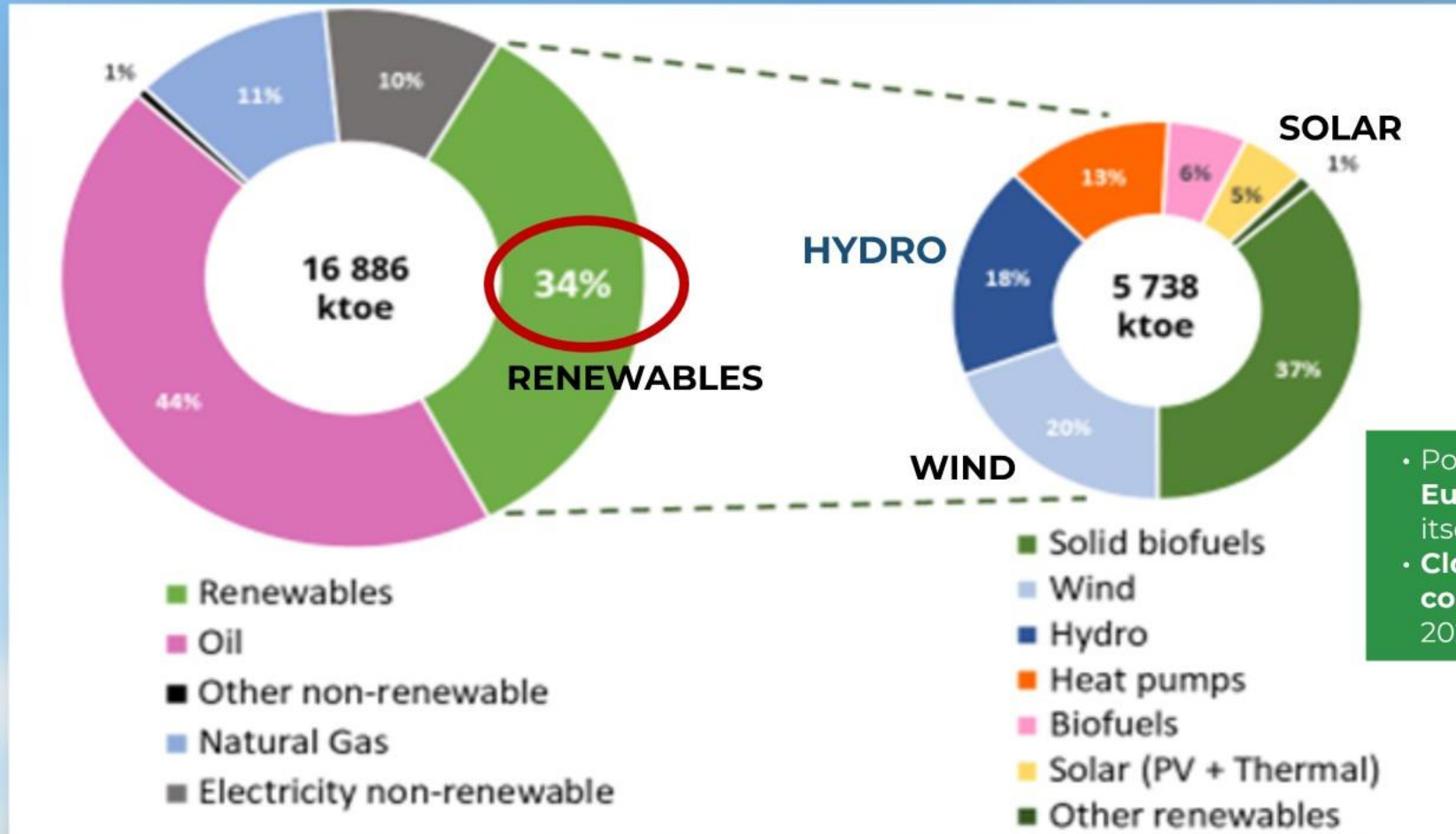
Note: Until 2009, PT with energy dependence between 70% and 93% (annual report Energy in Numbers, DGEG and ADENE). In 2022, it presented a value of 65.8%

Achieving carbon neutrality (2050*)

* anticipation of the target for 2045 (Climate Law Base)

Renewable energy in Portugal

Portugal has been a leader in the decarbonisation process



- Portugal became the **4th European country** to free itself from coal (**coal free**)
- **Closed its last remaining coal plant** in November 2021

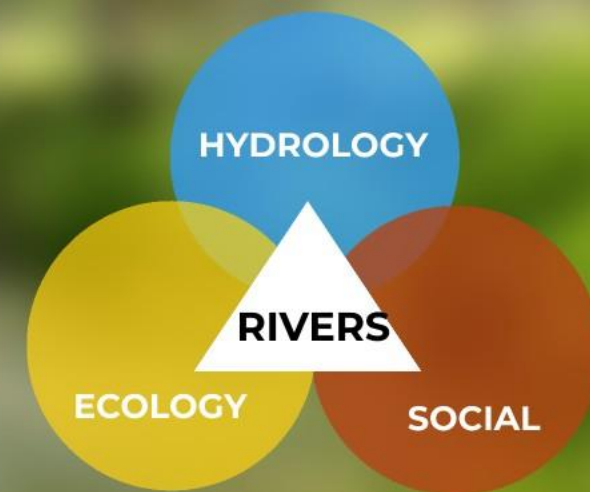
Renewable energy sources in gross final energy consumption (2021)

Restoration Strategy for Portuguese Rivers: Nature-Based Solutions



Lines of innovation

- **integrated** and **multidisciplinary solutions**
- generate **direct positive environmental impact**
- **capture** tonnes of **CO2**
- **locally-generated interventions** with **local materials**
- respect for **local traditions** alongside **scientific innovations (NBS)**



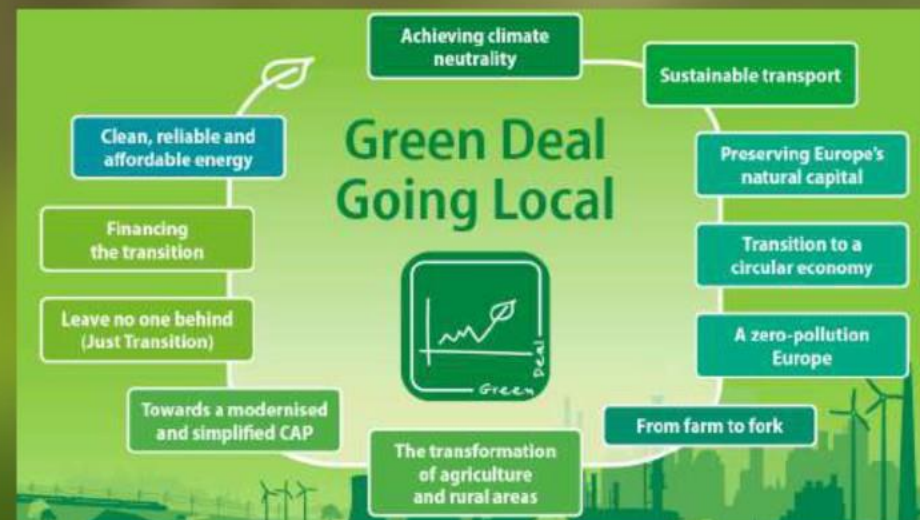
**PUBLIC
PARTICIPATION**



Cities' path to carbon neutrality: A Green City Model

Path to Carbon Neutrality | A Green City Model

ALIGNMENT FOR SUSTAINABLE DEVELOPMENT



- INTEGRATED POLICIES
- RESILIENT BUILDINGS
- SUSTAINABLE TRANSPORT
- REDUCE DEATHS, LOSSES DUE TO DISASTERS
- REDUCE CITY ENVIRONMENTAL IMPACT
- PROVIDE ACCESS GREEN PUBLIC SPACES

MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE



- STRENGTHEN RESILIENCE TO CC-HAZARDS & DISASTER
- INTEGRATE CLIMATE CHANGE MEASURES IN POLICY
- IMPROVE CAPACITY ON CLIMATE CHANGE

PREPARING THE CARBON NEUTRALITY | CLIMATE ACTION

STRATEGIC MODEL



Energy



Water



Mobility



**Descarbonization and
Climate Action**



**Waste
Management**

Trend

- Demographic Dynamics
- Citizens expectations
- Digitalization
- Climate emergency

mitigation, adaptation, resilience



Aims of the Mission

The Cities Mission will involve **local authorities, citizens, businesses, investors** as well as **regional and national authorities** to:

- Deliver **100 climate-neutral and smart cities by 2030**
- Ensure that these cities act as **experimentation and innovation hubs** to enable all European cities to follow suit by 2050



GUIMARÃES



LISBON





LISBON Climate action

10.000 ha
total area

547.733
residents

925.959
residents + daily
commuters

7,7 million
tourists/year

1.406.000
jobs

Lisboa

Lisbon Metropolitan Area



10.000 ha
total area

4.432 ha
green areas

547.733
residents

890 ha
green areas
irrigated

925.959
residents + daily
commuters

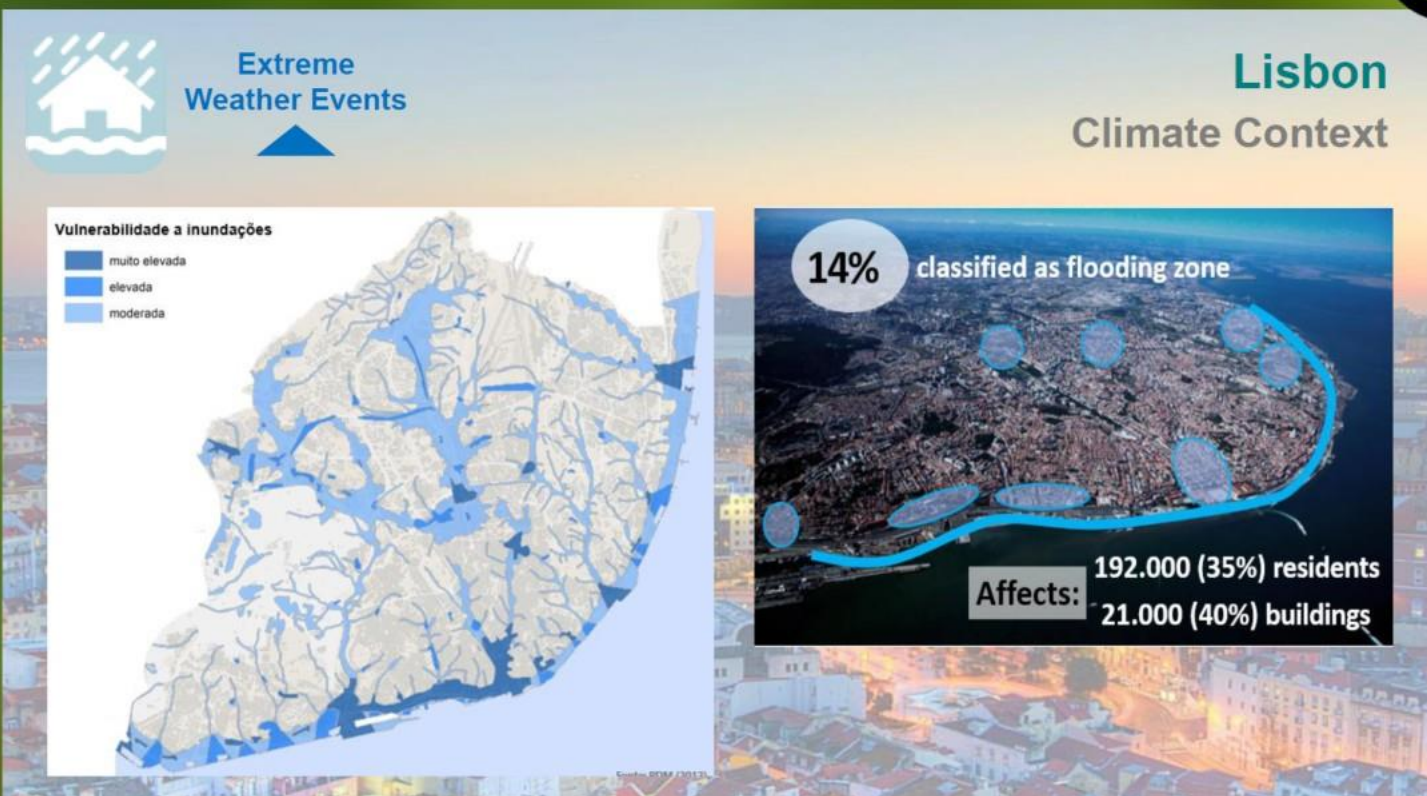
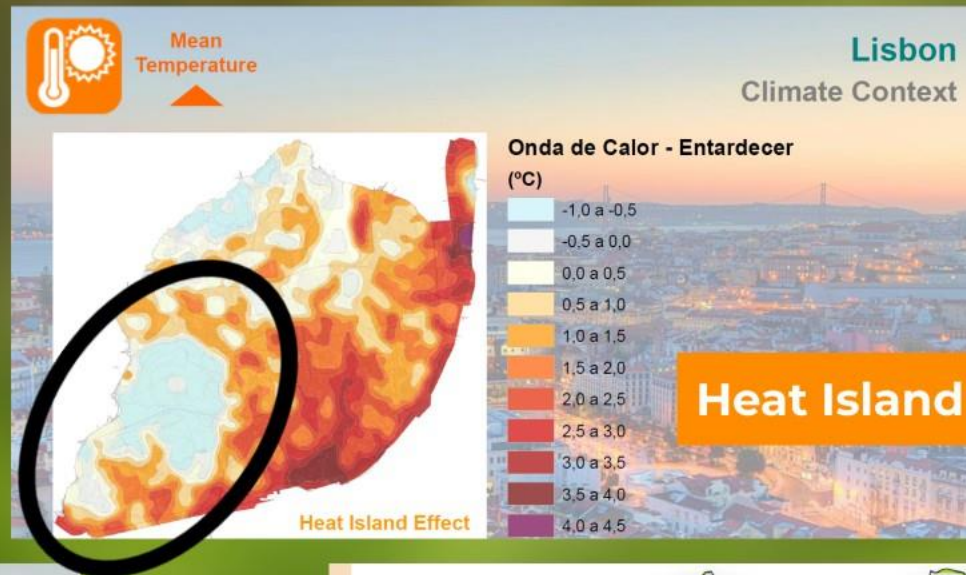
445 ha
agricultural
areas

Lisboa

Water
Use
3 millions
m³/year

Lisbon Metropolitan Area

Lisbon | Climate context



Climate Action in Lisbon

How can we grow **Green Infrastructure**,
without compromising **Blue Infrastructure**



Climate Action in Lisbon Increase Green Infrastructure

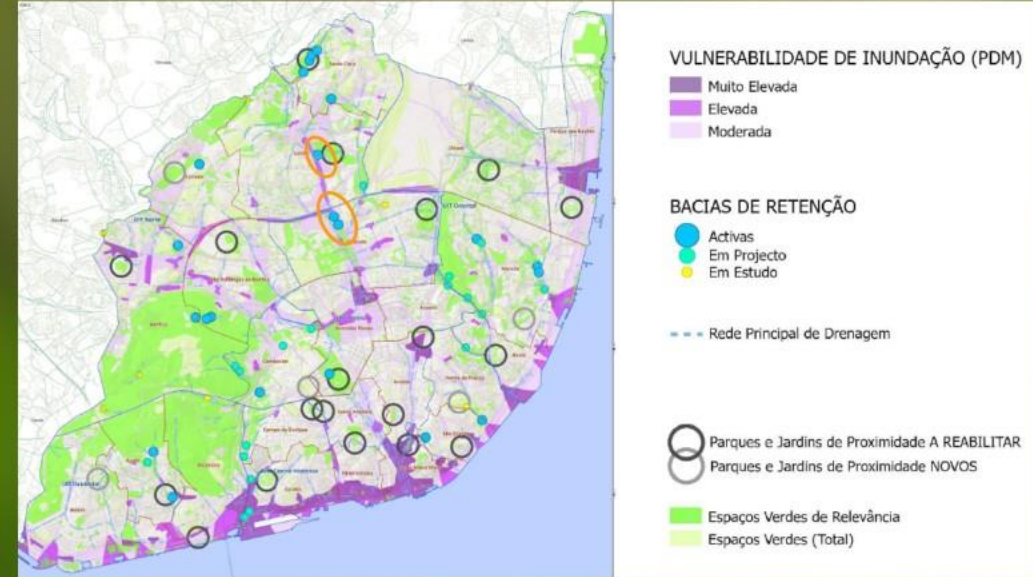
- Increase the green and permeable areas, allowing the “**natural ventilation corridors**” to cool the city and regulate the climate
- **Adapt the green infrastructure**, choosing native plants and more adapted species (more resilient to water stress) and enhancing biodiversity
- **Planting rainfed biodiverse meadows**, instead of classical grass fields
- **Reinforce the vegetation at a street/neighborhood level** > Program “**A tree in each corner**”
- Create “**cooling islands**” in Urban Heat Island Effect critical areas > Program **Colling the City**



Climate Action in Lisbon Improvement of the drainage system and Wastewater Reuse

Climate Action in Lisbon Improvement of the drainage system and Wastewater Reuse

- Build **retention/infiltration basins** and regulate and renaturalize watercourses, improve the city's drainage system and infiltration capacity.
- Construction of 2 large **tunnels for inter-basin transfer** and improvement of stormwater drainage.
- Diversify **sources of non-potable water**
- Construct a water distribution system for **reuse**
- Implement a **monitoring and warning system**



2019
BEFORE

Praça de Espanha:
a car-dominated area



2023

Praça de Espanha, BEFORE



Floods, after storm in September 2014

Climate Action in Lisbon Improvement of the drainage system and Wastewater Reuse

Praça de Espanha, AFTER



Water Use challenges

Lisbon

Water Use challenges

- **Distance** from fresh water sources;
- **Increase of urban green areas** and water demands;
- **Growing population** and economy;
- Growing urbanization and **soil sealing**;
- **Riverfront areas vulnerable to sea level rise**, with high touristic value;
- **Watercourses and streams partially artificialized**, with erosion and bottleneck problems;
- **Old sewage/unitary network** (risk of collapsing).



Water Smart use in Lisbon

efficiency, monitor, 'fit-for-purpose'

STRATEGIC OBJECTIVES:

- Reducing the use of freshwater resources;
- Improving recovery and reuse of resources;
- Increasing water use efficiency;
- Ensuring water for all;
- Safeguarding ecosystems & their services;
- Boosting value creation around water;
- Promoting adaptive change;
- Engaging citizens and actors across sectors.



2023

2030 > 2050



Potable Water



Reclaimed Water



Other non potable sources



Potable Water



Reclaimed Water



Other non potable sources

2nd Wastewater Reuse in a new Park (38 ha),
an old landfill site decommissioned in the 1990s

**38
ha**



World Youth Day 1 – 6 August 2023

1,5 million pilgrims



**Lisbon rolls out the green carpet
for the Pope!**

watered with recycled water **agua+**





GUIMARÃES City: Green transition





2001



2012



2013



2014



2015



2018



Guimaráes 2030

2019



Energy Efficiency Office

2021



2022



NET ZERO CITIES



2023



District C: a Zero-carbon Commitment



2030



Application 2025



LANDSCAPE LABORATORY

- Centre for Environmental Research and Education;
- Founded in 2014 by Guimarães City Council and the University of Minho and the University of Trás-os-Montes and Alto Douro;
- Based on three main areas of intervention: Research and Education, Project Management and Applications, and Communication and Environmental Training



AXES

RESEARCH AND
EDUCATION

PROJECT MANAGEMENT AND
APPLICATIONS

COMMUNICATION AND
TRAINING



AREAS

BIODIVERSITY
AND WATER
RESOURCES

GREEN
AREAS AND
LAND USE

CIRCULAR
ECONOMY

CLIMATE

HEALTH
AND
WELLBEING



We reinforced
**monitoring
and reporting
system**

Environmental indicators data



We are acting for Climate
Adaptation

Retention Basins



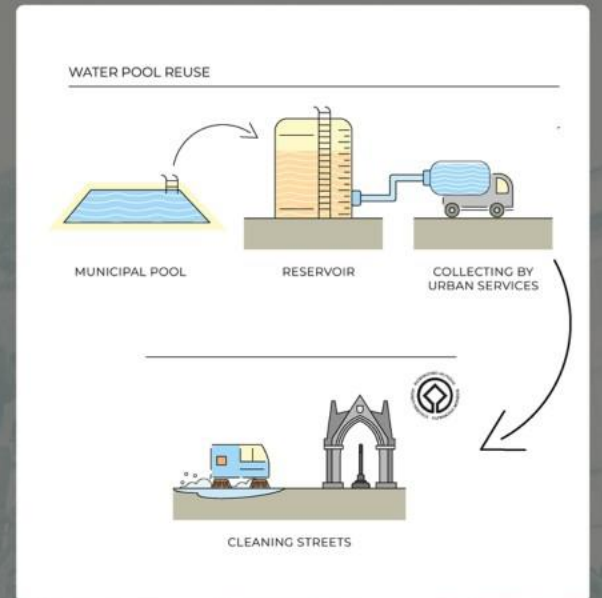
We reinforced
awareness

Events and Activities



We are acting for Climate
Resilience

Water Circularity



We are acting for Climate
Mitigation

15 min City and Public Transport
Decarbonization



We are acting for nature
**61km
Rivers
greenways**



- GREENWAY OF AVE (29 KM)
- GREENWAY OF SELHO (22 KM)
- GREENWAY OF VIZELA (10KM)
- BUILT HERITAGE
- LEISURE PARKS
- SPORT FISHING AREAS
- WILDLIFE OBSERVATION POINTS
- BATHING SITES
- TREE GROUPS OF INTEREST

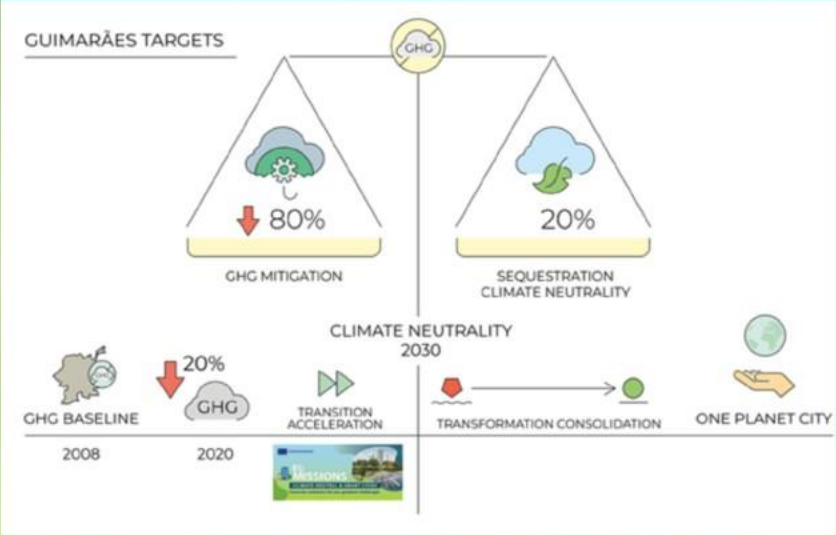


We are acting for nature
**Invasive
Species**

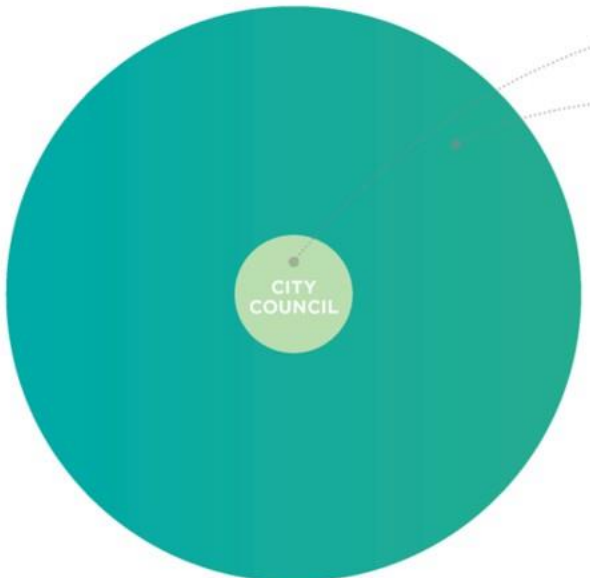


Mission Cities

Climate Neutrality 2030



2030 Climate City Contract Investment Plan



77 M€

Municipal Investment

1174 M€

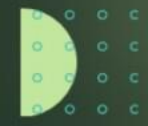
Total Investment

Areas

- Sustainable Energy
- Zero Waste
- Zero Emissions mobility
- Nature, Biodiversity & Soil

A large, realistic globe of Earth is the central focus, showing continents and oceans. It is surrounded by a diverse group of people of various ages and ethnicities, all holding hands in a circle. The scene is set on a cobblestone pavement. The text "One Planet City" is overlaid in white, bold, sans-serif font on the globe.

One Planet City



apa
agência portuguesa
do ambiente

THANK YOU
OBRIGADO
apambiente.pt



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