Big climate challenge – how cities can adapt and innovate using nature-based solutions

“A Mediterranean contrast to big climate change challenges: how cities and SMEs are working together to address challenges”

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The city of Malaga

Key facts

- Located in the south of Spain.
- Population: 578,460 inhabitants (ranked 6 in Spain, 46 in EU).
- Malaga is the 1st Andalusian economy & the 4th in Spain.
  - Tourism, textile, and significant activity in IT.
- What is PROMÁLAGA? Promálaga is a company of the Malaga City Council that works on business promotion, job creation and talent attraction.
  We promote the entrepreneurial spirit, ***innovation projects***, business impulse and technological investment in R&D.

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Important issues due to climate change patterns

- Temperature challenges: Increase in ºC, increase in avg. ºC, increase in number of days with high temperatures, heat island effect.
- Water challenges: Decrease in rain fall, decrease in rainy days, increased risk of drought, increase in floods from torrential rains.

→ Directly affects:

  - Environment and biodiversity
  - Primary sector
  - Urban environment
  - Health
  - Tourism

- In 2019 the City Council recognized the Climate Emergency situation of the city.

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Response to climate change adaptation and mitigation (city plans and actions)

- 2008: Malaga signs the **Covenant of Mayors**: the signatories commit to develop an Action Plan for climate and Sustainable energy.

  →Malaga develops **ALICIA**, the **Climate Plan 2050** and approves it in 2020.

- **ALICIA** is a comprehensive open plan in 4 parts with strategic and concrete action lines.
  - →A0: ALICIA's outstanding actions.
  - →A1: Evolution of Consumption and CO_2 emissions 2002-2017
  - →A2: Methodology and elaboration of CO_2 emissions scenarios in Malaga 2017-2050
  - →A3: Assessment of risks and vulnerabilities to climate change in Malaga
  - →A4: Stategic lines of mitigation and adaptation. In total 40 strategic lines and 98 specific actions
- **SDGs Action Plan**: Developed by Ciedes, an institutional foundation in charge of drafting the strategic plans of the city and putting them into operation following the United Nations SDGs.
- **Sustainable Mobility Plan**: Five pillars: Mobility on foot / Mobility by bike / Mobility in public transportation / Mobility in private transportation/ Organization of parking areas.

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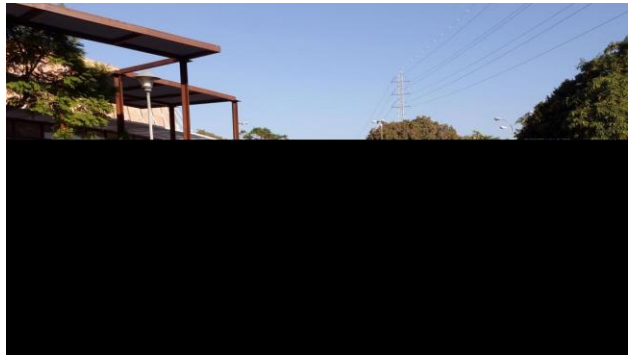
Relevance of nature-based solutions

- NbS is still a new concept, even though the city is starting to implement NbS and has created an NbS cluster.
- Some examples of NbS in Malaga:
  - San Telmo's Acueduct
  - Vertical garden in Pericon Square
  - Great Coastal Path, along the sea shore. This path will reach 178km long once finish. It will run through all the malaga coastal line from east to west.
  - UMA Green islands and paths



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NbS Cluster

- The cluster was created in 2018. It is made up of public and private institutions, academia and NGOs in an example of public-private collaboration.
- Its purpose is to accelerate implementation of NbS in Malaga, exchange information on innovation, raise awareness with the wider public about products and services, advise the city in projects like ALICIA and the Green Ring and create new jobs.
- An example of SME in the cluster: BIOAZUL.

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Strategic line: water management

Urban Agenda for Integrated Sustainability Strategy (2020-2050)

- Reuse of treated wastewater, water saving and efficient use, and rainwater harvesting.

ALICIA Plan 2050

- Management and efficient use of water (e.g., reduction of the demand for water resources, introduction of new technologies and sensors for saving and reusing irrigation water).
- Circular and local economy (e.g., Local Circular Consumer Promotion).

City Strategic Plan 2020

- Innovate and optimise integrated water management.

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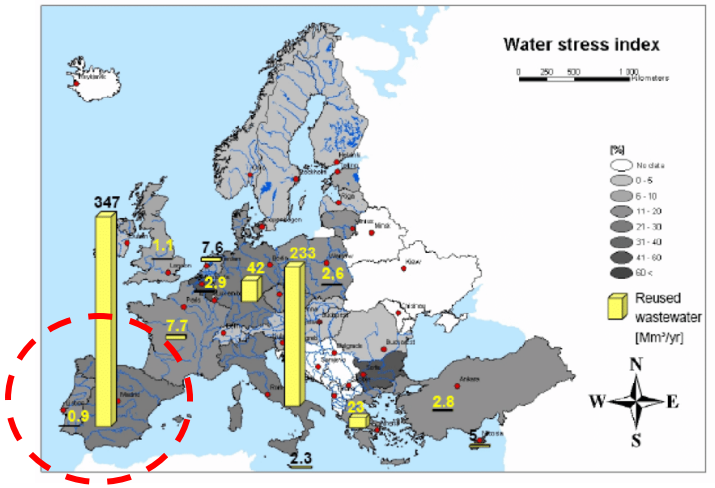
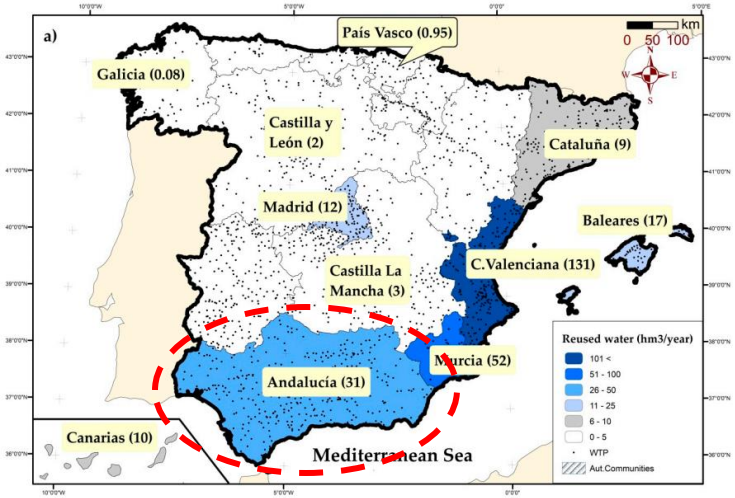
Wastewater treatment and reuse

- Spain is the European leader in wastewater reuse (in volume) and holds fifth position in the world in terms of capacity installed for reuse.
- 10.7% of treated wastewater is reused in Spain, compared to 2.4% in Europe (2014). Cyprus and Malta reuse up to 90% and 60% of treated wastewater, respectively.
- Royal Decree 1620/2007 legal framework for the reuse of treated wastewater (e.g., nature-based solutions).
- In Andalusia, 698 hm^3 of wastewater treated annually.
- Coastal areas usually discharge treated wastewater to the sea.



Water stress and treated wastewater reuse in Europe



Wastewater reused in the Spanish Autonomous Communities (hm3/year)

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What is BIOAZUL?

- Engineering and technological consultancy focused on development of eco-innovative and sustainable solutions for urban and industrial water management while recovering resources.
- Solutions for the treatment and reuse of water and recovery of resources based on technologies resulting from research, development and innovation projects.
- Design and adaptation of technical solutions to the client's specific requirements: best solutions for specific problems.

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Technical solution

- **RichWater® technology**
- Reuse of wastewater effluent from the municipality of Algarrobo (Malaga).
- Integrated system of water treatment (MBR + prefiltration + disinfection) and irrigation.
- Flow: 150 m^3/day
- Use of treated water: agricultural (irrigation and fertilization of tomatoes, avocados, mangos).
- Other uses: urban (irrigation of green areas and parks, urban forests, community gardens, etc.).
- EU Environmental Technology Verification (ETV)

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Designed for local context and needs

- Market demand on specific products and limitation to production due to the lack of water.
- Common vision of all relevant actors of the value chain (Quadruple helix).
- Creation of Operational Group “Axarquía Sostenible” (EIP-AGRI).
- Included in Atlas of the European Water Oriented Living Labs.
- “Malaga Viva 2020” award to SMEs providing technical solutions for climate change adaptation in the province of Malaga.

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Thank you!

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