



# Second Open Tender for Innovations

## Case Study #1: Athens

Supplementary information

Date: 20.11.2023



This project has received funding from the European Union's Horizon 2020 innovation action programme under grant agreement 101037424.

## The Case Study #1: "Greening Athens"

Extreme Heat is defined by the recent Climate Action Plan of Athens, as the number-one threat, while at the EU level Athens ranks first among 571 European cities studied in terms of impact derived from heat waves<sup>1</sup>.

The mean annual temperature of Athens has increased steadily since 1970, by 1.3 °C between 1970 and 2011, while the mean summer temperature has increased even more sharply, by almost 1 °C per decade. The urban heat island becomes increasingly intensive (up to 8 °C has been recorded), along with the heat waves, which are more frequent, intense, and prolonged. The recent climatic projections foresee a further increase of the maximum summer temperature by 2 °C for the period 2031 to 2050.

The climate change impact, combined with the anthropogenic activities in a highly density populated area, suffering from a lack of sufficient urban green areas, also affected by the wildfires of its peri-urban forests over the last years, resulted in an alarming situation for Athens, with direct environmental and socio-economic impacts.

The need for action to protect the most vulnerable part of the population during heat waves, such as the elderly and the children, with immediate response actions, as well as to plan and improve the city's preparedness and adaptation capacity, are acknowledged priorities of the city's administration. Athens is the first city in Europe that has officially established the appointment of Chief Heat Officer since 2021, responsible for tackling the Urban Extreme Heat and ensuring the protection of the most vulnerable citizens.

A system innovation approach is applied by ARSINOE to enhance the city's capacity to deal with extreme heat, integrating innovation, science and citizens, through living labs, youth assemblies, citizen science.

Various tools have been developed that assess the quality of life in the city of Athens. This includes accessibility to existing green areas, identification of temperature and air pollution hotspots, delineation of urban habitats and factors that enhance biodiversity<sup>2</sup> as well as a socio-economic vulnerability to heat assessment throughout the city. An intense data collection campaign is launched with data coming from earth observation, open sources, as well as citizen science apps. Collaborations with educational authorities have been initiated and there is heavy involvement of students in collecting biodiversity occurrence data throughout Athens via the citizen science app [MINKA](#) as part of their environmental education curriculum. At the same time, Urban Heat Island analysis is ongoing to identify the areas most suitable for the green solutions to be designed in ARSINOE.

## The "Athens" Living Lab

The inclusion of a diverse set of stakeholders from the Athens Metropolitan area in the project is a key element of ARSINOE and the case study. In a Living Lab, we bring together people affected by climate change and central to adaptation in the region. The results of the debates in the Living Lab feed our understanding of the innovations we seek with this tender.

---

<sup>1</sup> Giannaros, T.M., Melas, D., Daglis, I.A., Keramitsoglou, I. and Kourtidis, K., 2013. Numerical study of the urban heat island over Athens (Greece) with the WRF model. *Atmospheric Environment*, 73, pp.103-111.

<sup>2</sup> Ziliaskopoulos, K. and Laspidou, A. "Using remote-sensing and citizen-science data to assess urban biodiversity for sustainable cityscapes: the case study of Athens", *Landscape Ecology*, accepted for publication, <https://www.researchsquare.com/article/rs-2973172/v1>.

In the Living Lab we discussed key challenges arising from climate change and how they are interlinked to develop a joint understanding of current and future challenges in the Athens area. Subsequently, we imagined what a climate-resilient future in the region might be like in 2050 and we formulated a vision for Athens. In this tender for innovations, we want to contribute to solving the identified problems and to make this vision a reality.

Below, you can familiarise yourself with the challenges stakeholders identified as well as with their vision of 2050. Ultimately, we outline the key challenge for this tender for innovations.

## The Problem Statement by Stakeholders

The stakeholders of the Athens Living Lab shared their views and experiences regarding the extreme heat, formulating the problem statement in terms of impacts, consequences, challenges, related systems and initiatives, and potential means for mitigation or response, to deal with them.

In terms of impacts, the stakeholders referred to:

- The increased use of energy for cooling or transportation leads to increased air emissions and GHG; or the energy poverty increasing the vulnerability of the economically weak.
- Extreme heat and impact on physical & mental health and social well-being; an increase in violence was also reported during the extremely hot days.
- Reduced touristic fluxes, leading to reduced income for the city.

The challenges deriving from extreme heat can be grouped into environmental and socio-economic:

- Biodiversity loss, physical disasters, extreme heat, climate change, green degradation and lack of green corridors, were the main environmental challenges discussed.
- Lack of an integrated legal framework, lack of equity/increased vulnerability intensified during the COVID era, limited free urban spaces/competitive land uses, and insufficient accessibility to green spaces, were amongst the socio-economic challenges of concern.

The stakeholders referred to relevant initiatives such as the European Bauhaus, or policy documents at the local/national/EU level, e.g. for the adaptation to climate change impacts or the protection of biodiversity, and the importance of the mobilisation of EU/national and private funds for dealing with extreme heat.

Related physical systems, such as green infrastructure and blue infrastructure, were discussed for their immediate and positive impact in cooling the city and providing relief when it comes to extreme heat. Existing infrastructure and cultural sites, should be part of an integrated plan dealing with climate change impacts, addressing extreme heat.

## The Vision of a climate-resilient Future

With reference to the 2050, the stakeholders formulated and validated the following vision for Athens:

*Athens is a **green and cool city!** It has established a strategic management of urban nature, integrating green and blue infrastructure to enhance the city's biodiversity and resilience to **extreme heat**. The management of **urban nature** ranks high in the city's priorities, implemented with commitment, continuity, and vision. Athens has a **revitalized and vibrant city center**, with sustainable mobility and no air or noise pollution. **Urban green areas**, green and blue corridors are developed and integrated into the city's **cultural routes**. Athens actively promotes **Green Architecture** to cool the city: it is abundant with urban gardens, planted rooms, green roofs, vertical gardens and green buildings. **Innovative solutions** are fully explored, learning from **international experience** and mobilizing **green funding**. Athens is an example of **inclusion and equity**, its **citizens are active and well-informed**, and there is social welfare for all, especially the **vulnerable**; the city knows where they are and responds swiftly to protect them.*

## The Key Challenge for the Tender for Innovations

The key challenge for the open tender for innovations is enhancing the city's capacity to deal with extreme heat, both in terms of preparedness and planning as well as responsiveness during the events.

Different climate adaptation measures, such as nature-based solutions, modeling and monitoring tools could contribute to addressing this challenge, embedded in the City's plan for adaptation to climate change. While certain measures are already implemented or under development, there is still room for innovations that can enhance the city's resilience. Implementation requires the motivation and cooperation of different actors, knowledge sharing between sectors and a conducive framework. The creation of such conditions could require education and capacity building to support social, behavioural changes and governance actions.

Other areas of action may include but are not limited to: 1) greening solutions with direct or indirect cooling effects for the city, 2) water management measures with direct or indirect cooling effects for the city, 3) measures to enhance the city's capacity in protecting its vulnerable population, 4) tools to facilitate the city's decision-making capacity, 5) measures to assess or mitigate the impact on human health and/or economic sectors.

We seek social, technical and governance innovations as well as concepts for light structural and nature-based solutions in an extreme heat management context.

## Additional requirements for applicants of the 2nd Open Tender for Innovation

**Mature Solutions Sought:** The CS1 is in search of an "off the shelf" solution. This means the solution should be mature, readily available in the market, or have a proven track record of wide implementation and effectiveness.

**Preference for Light Structural Solutions:** Solutions that are light in structure and do not require special permits will be considered more feasible and are preferred.

**Implementation in Vulnerable Areas:** For the implementation of innovations in Athens, the city may identify specific vulnerable areas as priority locations. These areas will be defined and agreed upon during the negotiation stage.

**Prerequisite Description:** Applicants must detail any prerequisites necessary for the implementation of their proposed innovation or its variants. This may include, but is not limited to, existing infrastructure like digital maps or specific layers. These prerequisites will be further evaluated and detailed during the negotiation stage post-selection.

**Post-Implementation Requirements:** Tenderers are required to describe the maintenance and support needs of their solution after its implementation and delivery. This includes outlining any ongoing support, updates, or maintenance that will be necessary to ensure the solution's continued effectiveness.

**Grant Ceiling and Applicant Selection:** The maximum grant amount available for each selected innovation under this tender is set at €30,000. The aim is to select a total of three applicants who best meet the tender criteria and demonstrate the potential for impactful innovation in addressing the key challenges of CS1 Athens.