References

Invisible climate control via radiant ceiling panels in Seville’s bus shelters



Experimental cooling system

The Life WATERCOOL project, co-funded by the EU’s Life initiative, is developing a water management system to tackle high temperatures in the city of Seville. It has been developed by Emasesa, Alten, Seville City Council, the University of Seville and Uponor.
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The aim of the project is to improve the urban climate in the target area by reducing the temperature by 3–5 °C and generating 28 °C of cool air through the implementation of sustainable climate change adaptation measures in urban spaces. To this end, three bioclimatic comfort interventions have been carried out: one for a space with high occupancy density over a short period of time (bus shelter), one for a space with intensive but intermittent use (school playground), and one for a space with variable occupancy over a longer period (public square).

Uponor has contributed to the project with its Uponor Ecoflex solutions, which provide cold water storage for appliances whilst ensuring minimal energy loss, and for cooling the canopy via its Invisible Climate Control system using a radiant ceiling with Thermatop M.

Project Facts:

Location	Completion
Sevilla (Andalucia), Spain	2024

Building Type

Airports / Transportation

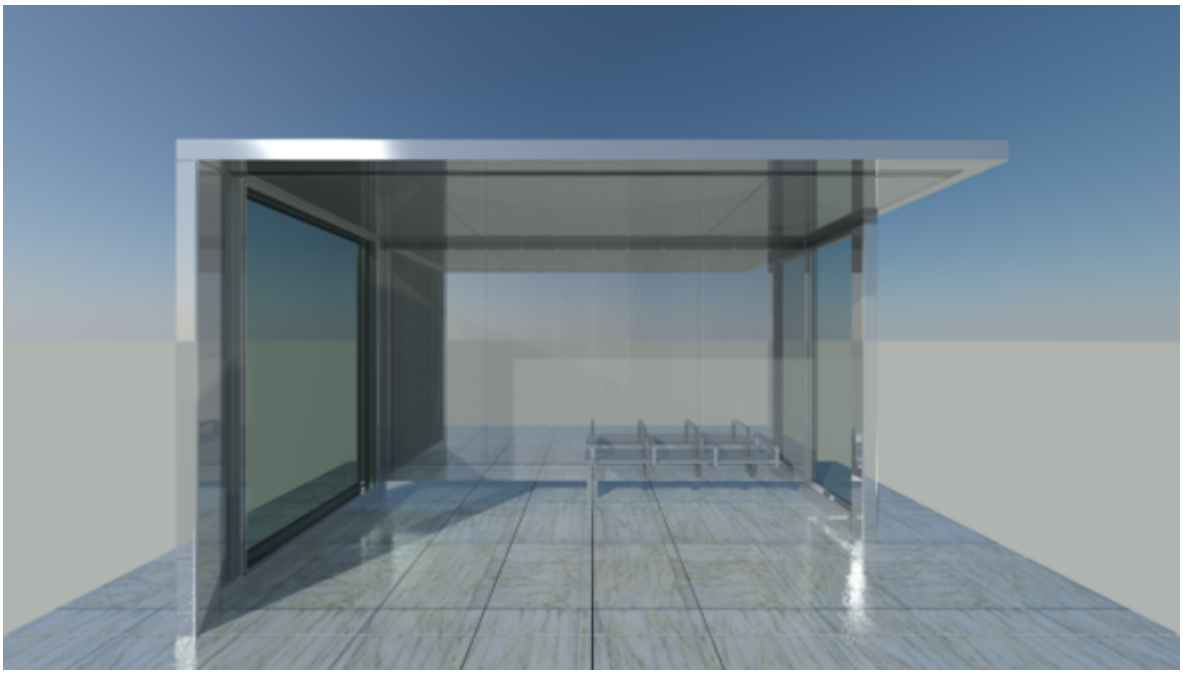
Partners

Coordinador: Emasesa

Entidades participantes: Alten, Ayuntamiento de Sevilla y Escuela Técnica Superior de Ingeniería de la Universidad de Sevilla

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The power of water to lower ambient temperatures and improve citizens' well-being



"The research team has drawn inspiration from the various techniques used throughout history to combat the heat and even generate coolness naturally using water," explains Dr Jose Sánchez Ramos, senior lecturer at the University of Seville and the project's co-scientific and technical lead.

The Life WATWERCOOL system solution is based on an innovative water network with thermal storage, which can be supplied with rainwater or reclaimed water from a treatment plant. The storage system consists of over 50 m³ of water in two tanks buried beneath the road surface. This water is cooled naturally overnight and is used during the day for climate control in three new communal areas or climate-controlled shelters, and could even naturally cool the primary school.

Dr Jose Sánchez Ramos also concludes that "this solution would enable two-way energy connection (exchange for consumption or supply) between rooms or shelters in open spaces or between buildings".

Uponor was involved in the calculations and initial design, as well as providing technical support during installation, calibration and commissioning. According to Israel Ortega, Senior Manager, Field Service Southern – Eastern Europe & MEA at Uponor, "from the outset, it was clear to us that ECOFLEX would be ideal for conveying water as a heat transfer fluid, forming the necessary district micro-network infrastructure. This solution also combined perfectly with the Thermatop system, which allows 'thermal comfort islands' to be integrated into the canopies. An innovative and 100% sustainable ecosystem that makes use of local resources through the concept of distributed generation, via the interaction of natural resources such as the sun, the land, vegetation, air and water."



“Uponor has been involved in the project since the initial design phase of the water network and climate-controlled shelters. Furthermore, it has provided a solution to the need to connect the storage system to the cold-water outlets using Ecoflex piping, to minimise energy loss, and to the cooling of the canopy using its ‘Invisible Air Conditioning’ system via a radiant ceiling using Thermatop M.”

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