Protecting the thermal resource, an asset for the future of Caldes

Caldes de Montbui is participating in the European project ThermEcoWat, which focuses on studying the effects of climate change on thermal water resources, as well as on designing new strategies to strengthen and enhance the resilience of the sector.

Although thermal waters generally originate from deep, ancient sources that may have travelled underground for hundreds or thousands of years, on their way to the surface they can mix with younger, more superficial waters with different chemical characteristics and cooler temperatures.

Experts explain that these surface waters are more vulnerable to current changes in rainfall patterns and temperature, and are likely to be impacted in the medium term by climate change. **"The mixing with this water can alter the chemical and physical properties of the thermal water and, in extreme cases, render it unusable as medicinal mineral water",** explains Georgina Arnó, Head of the Hydrogeology and Geoenergy Unit at the Cartographic and Geological Institute of Catalonia (ICGC). In fact, **"by analysing current uses of thermal water and the specific geological sectors from which this natural resource emerges, we understand that there are multiple consequences of climate change affecting thermal water, some of which are already present today", states Christian Iasio, Deputy Regional Director of BRGM - Service Géologique Nationale in France.**

In light of the clear threats and technical uncertainties surrounding the impact of climate change on thermal water reservoirs, and faced with the urgent need for resilience and adaptation of thermal destinations that could inevitably be affected in the near future, the new European project ThermEcoWat is pioneering a cross-sectoral approach. It brings together scientists, public authorities, and economic stakeholders to recover and preserve natural heritage, and to strengthen and sustain ecosystems linked to thermal waters. **"Our goal is to plan for adaptation strategies to address climate change, for communities whose socio-economic survival depends on thermal resources; specifically, to verify whether current exploitation strategies are compatible with projected climate change impacts for the period 2040-2060", continues lasio, who also serves as the scientific director of ThermEcoWat. This project is funded through the Interreg SUDOE 2021-2027 programme, with a budget of 2 million euros and eight European partners, including the ICGC and the Caldes de Montbui town council.**

"Being part of the European Historic Thermal Towns Association (EHTTA) allows us to participate in European-funded programmes like ThermEcoWat, in addition to promoting the town at the European level,", explains Isidre Pineda, Mayor of Caldes de Montbui. Working alongside recognised expert organisations such as the ICGC, and with funding of up to 250,000 euros, the municipality participates as a leading member, to study the application of theoretical and scientific knowledge to the local context. "The most valuable aspect of being part of this project is gaining deeper and more specialised knowledge about our most unique resource —thermal water.

This enables us to make better decisions, manage the water more effectively, and greatly improve our capacity to adapt and build resilience against the effects of climate change", explains Pineda. "We look to this network of European thermal towns involved in the project —São Pedro do Sul (Portugal), parts of Auvergne (France), Ourense and Caldes de Montbui (Spain)— as well as to experts from geological institutes in France and Portugal, and the Cartographic and Geological Institute of Catalonia", he adds.

In the latter case, the institute, under the auspices of the Government of Catalonia, is responsible for promoting and carrying out activities related to the knowledge, exploration, and information on soil and subsoil. **"The ICGC actively contributes to content creation and methodology exchange with the other partners, aiming to provide quality and relevant information to citizens, professionals, and institutions. It also plays a key role in disseminating the scientific and technical knowledge gained about Caldes de Montbui's thermal resource", notes Georgina Arnó from the ICGC.**

Over the three-year study period, the ThermEcoWat project will collect and centralise the existing geological and hydrogeological information, **"which, in the case of Caldes de Montbui, is extensive but scattered and poorly systematised",** Arnó clarifies. Moreover, the project will enable the gathering of new data, including chemical analyses of the waters and measurements of the available flow rate, helping to advance hypotheses about how Caldes de Montbui's hydrothermal system functions. **"Therefore"**, she continues, **"the project will provide a clear picture of how the thermal resource in Caldes is currently used, evaluating existing uses and their limitations, while exploring new possibilities to expand its use"**.

DATA COLLECTION MECHANISM

Given the need for technical information about the hydrothermal system, "we are currently installing digital meters that will allow us to obtain real-time, digital readings of the thermal water flow in Caldes", explains the mayor. Specifically, the municipal company GMSSA is installing around ten electromagnetic meters at the outlets that distribute water to the town's thermal system. "This digital tool will measure both the instantaneous flow rate and total flow of water reaching the springs, washhouses, and spas in the municipality", explains Jaume Francisco, manager of GMSSA.

Regarding the ThermEcoWat project, the installation of these meters represents a gateway to recording new parameters that will enable an accurate understanding of the volume of thermal water required for current economic uses. Based on this data, **"we can assess whether this volume will be sustainable in the future, and whether other potential uses could be compatible with the remaining available thermal water",** notes lasio.

HARNESSING THE ENERGY OF GEOTHERMAL RESOURCES

According to the ThermEcoWat consortium, thermal energy resources could be harnessed more efficiently. Technologies that tap into low-temperature geothermal energy and heat storage can contribute significantly to building a decarbonized economy, one that leverages thermal water without compromising its current uses.

Building on this premise, the project also aims to explore innovative solutions for thermal energy recovery. These would help integrate natural resources into the current energy mix and lay the groundwork for a cleaner, more sustainable energy transition. And since thermal water can ultimately be considered a renewable energy source, reusing it for energy could offer a valuable alternative with strong potential to promote sustainability and energy sovereignty, even at the local level. "Within the project, we often talk about thermal water, but also about energy and sustainability in thermal towns. In Caldes, we're well aware that, because the water is hot, it holds energy potential that could be significant. In this regard, the project will help us assess how much energy Caldes might be able to generate, whether through heat exchangers or geothermal systems", explains Isidre Pineda.

CALDES DE MONTBUI, HOST OF THE PROJECT WORKING SESSIONS On October 22 and 23, 2024, Caldes de Montbui hosted a workshop for the ThermEcoWat programme, bringing together around thirty representatives from participating European countries. It was a space for the exchange of knowledge and experiences in managing geothermal systems among various municipalities in southwestern Europe, each with its own particularities, opportunities, and challenges.

At Espai Can Rius, scientists, technical experts, and elected officials representing various thermal towns came together to reflect on topics such as geothermal energy, geological heritage, geothermal systems, and the energy transition in spa towns. They also discussed the natural, legal, and economic frameworks, as well as the limitations and risks linked to the impacts of climate change. **"It was very interesting to see how we share common ground with leading towns like Vichy, particularly when it comes to the regulation of thermal waters and geothermal potential. And at the same time, we discovered examples like thermal towns in Portugal, which have heat exchanger plants that generate energy"**, the mayor added.

Caldes de Montbui – Catalonia - Spain Published in the local press "El Calderí" by Ivette Hijano.