

As Heat Waves Intensify, Europe's Cities Rely on Age-Old Ways to Stay Cool

Architectural styles and construction materials can significantly reduce the need for air-conditioning during heat waves, according to sustainable architecture experts.



By Jenny Gross

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There is no single architectural technique that can solve the problem of sweltering heat, which has gripped large parts of Europe this summer. But on a continent where air-conditioning is relatively limited, sustainable building techniques can go a long way in protecting residents, according to experts.

Those features, which include courtyards, heavy shutters, reflective painting and white-stone facades, can keep homes cool naturally and reduce the need for air-conditioning. The problem, particularly for Mediterranean cities that have endured scorching temperatures this summer, is that many newer buildings have been built using Western styles that trap heat, said Marialena Nikolopoulou, a professor of sustainable architecture at the University of Kent in England.

“We’ve started importing Western architecture and forgetting about local traditions,” Dr. Nikolopoulou said, speaking from Athens, the hottest capital on the continent — with an average daily maximum temperature of 92 degrees Fahrenheit (33.4 Celsius) in July — and one of the most densely populated. Modern, high-rise buildings and the use of materials like asphalt for roads trap heat, contributing to the “heat island” effect, in which cities are hotter than surrounding rural areas. A heat wave in Greece has led to tinder-dry conditions that have stoked wildfires in parts of the country.



Temperatures in Athens are among the highest of any European capital. Eirini Vourloumis for The New York Times

In the United States, some homeowners and businesses are investing in low-cost techniques to assist in cooling buildings, such as painting roofs white or another reflective color that can help make air-conditioning units more energy efficient. Miami-Dade County secured millions of dollars in federal funding to help retrofit homes and businesses to stay cooler in the summer.

In Mediterranean countries like Greece, Italy, Spain and Portugal, traditional houses tend to include qualities that allow for breezes to run through them. Thick walls help absorb heat during the day and release it at night, and features that provide shade, like pergolas, also serve to keep residents cool and reduce sun exposure, said Catalina Spataru, a professor of global energy and resources at the University College London Energy Institute. Narrow passageways in some city centers and tree-lined streets also provide shade for pedestrians.

Europe is experiencing heat waves at a rate that is more frequent and more intense than in many other parts of the world, and numerous homes are not equipped with air-conditioning. Governments in Greece, Italy and Spain have imposed measures to protect residents from the heat, including directing people toward public cooling spaces, relying on warning systems for extreme heat and making plans to create smaller neighborhood parks, which can be several degrees cooler than the streets.

Cooling experts say that increased reliance on energy-guzzling air-conditioning is not a sustainable solution. Conventional cooling devices, including air-conditioners and

refrigerators, already account for as much as 10 percent of all global greenhouse gas emissions, according to a World Bank report published in 2019. That amount is twice the emissions generated from aviation and sea travel combined, the report found.

Annual sales of air-conditioning units around the world have tripled since 1990, according to the International Energy Agency, an intergovernmental organization that provides policy recommendations on the global energy sector. In 2022, 89 percent of U.S. households had air-conditioning, compared with 19 percent in Europe, the I.E.A. found.

Particularly in places where air-conditioning is not available, lifestyle changes are critical for adapting to rising temperatures, cooling experts say. Those include avoiding outdoor activities during the hottest parts of the day, checking in on vulnerable neighbors and embracing the siesta — even in Northern Europe and places with cooler climates where people are unaccustomed to stopping work or activities in the afternoon heat.

While temperatures in Northern Europe are generally cooler than in Southern Europe, a major challenge is that many homes are designed to retain heat.

An example of this is Scandinavia, where many houses are built using lighter construction materials like wood, which is great for cold weather, but may make coping with extreme heat more challenging, Dr. Spataru said. “There is a kind of growing awareness that we need to design homes that are more resilient to extreme weather conditions,” she said.

A University of Oxford study published this month found that Britain, Norway and Switzerland would see the most dramatic relative increase in uncomfortably hot days if the global target of limiting warming to 1.5 degrees Celsius (2.7 degrees Fahrenheit) above preindustrial levels was missed. (Countries in Central Africa would see the most extreme temperatures overall, the study found.)

“Buildings and homes in Northern Europe are unsuitable for an increasingly hot climate,” said Radhika Khosla, an associate professor focused on cooling and sustainable development at the University of Oxford and a co-author of the study.

Without sustainable interventions, increased reliance on air-conditioning will contribute to a cycle of accelerated fossil fuel burning to keep people cool as the world outside gets hotter, she said.

Jenny Gross is a general assignment reporter. Before joining The Times, she covered British politics for The Wall Street Journal. More about Jenny Gross