

Press Release

Fraunhofer Platform OASITY® Demonstrates the Cooling Potential of Urban Greening and Surface Depaving

Web Platform Enables Municipalities to Simulate Climate Adaptation Measures

Records are usually something to celebrate - unless they are associated with the current heatwave. As daytime temperatures in many regions are approaching 40°C, nighttime temperatures often remain above 20°C. Especially in densely built urban areas, asphalt and concrete absorb and retain heat during the day, releasing it only gradually at night. Effective climate adaptation strategies are urgently needed. However, determining which adaption measures are most effective in specific locations remains a challenge. The Fraunhofer Institute for Building Physics IBP supports planners and local authorities in addressing this challenge through its web-based simulation platform OASITY®. The platform enables planning offices and municipal planning departments to evaluate the effects of urban greening, surface depaving, and other climate adaptation measures before implementation, while directly comparing different scenarios and strategies.

Growing Need for Action Amid Limited Resources

Many municipalities have already introduced individual measures to mitigate urban heat, including additional tree planting, green roofs, and the removal of sealed surfaces. At the same time, increasing financial constraints require public investments to be carefully prioritized and supported by reliable evidence.

“Many cities recognize the urgent need to take action. The key question is: Which measure will have the greatest impact at a specific location?” says Matthias Winkler, Head of the Urban Building Physics Modeling Group at Fraunhofer IBP. “Simulation-based planning provides data-driven answers to this question before costly investments are made.”

From Research Model to Planning Practice

OASITY® is based on the publicly available PALM-4U urban climate model, which simulates key urban climate processes, including thermal comfort, airflow, cold-air movement, and pollutant dispersion at both the city and neighborhood scales. Until now, such simulations

have largely been confined to research environments and specialized applications. With OASITY, however, planning consultancies and municipal planning departments can perform these analyses independently and systematically compare different urban development scenarios. This enables users to assess, for example, how effectively a row of trees can cool a street corridor or quantify the impact of replacing sealed asphalt surfaces with permeable green spaces. The platform can also be integrated into existing digital city models and urban digital twins, supporting data-driven urban planning and climate adaptation strategies.

August 10, 2026 Page 2 | 3

Urban Greening Reduces Temperatures and Energy Demand

The effectiveness of greening measures has been demonstrated through both simulations and field measurements conducted by Fraunhofer IBP. Green façades significantly reduce the heat absorbed by building envelopes. On hot summer days, surface temperatures of non-green façades can be up to 20°C higher than those of comparable greened surfaces. The cooling effect extends beyond the building exterior. By reducing heat transfer through the façade, vegetation helps limit indoor temperature increases, thereby lowering the need for active cooling. Technical systems such as ventilation and air-conditioning equipment can also benefit when located within a cooler microclimate created by surrounding greenery.

This cooling performance can translate directly into lower energy consumption: Because vegetated façades reduce solar heat gain and surface overheating, cooling energy demand within buildings decreases accordingly. Thus, greening measures not only help communities adapt to increasing heat stress but can also reduce the energy consumption of buildings.

The benefits are equally evident at the neighborhood scale. Simulations performed with OASITY® show that greening strategies can substantially reduce heat stress in densely built urban areas. In the city of Rosenheim, model calculations indicate that greening measures can lower the perceived temperatures by up to 5°C on a hot summer afternoon. Simulations for the Munich district of Giesing show reductions in heat stress ranging from 3°C to 7°C, depending on the location and design of the greening measures.

Simulations Provide a Reliable Scientific Basis for Decision-Making

“Simulations do not replace political decision-making,” says Winkler. “However, they reveal the actual effects of different climate adaption measures in urban environments, thereby reducing uncertainties in the planning process.”

The models simulate physical parameters such as temperature, wind flow, and solar radiation. While social or usage-related factors are not directly included in the simulations, they can be overlaid with the simulation results and evaluated together, as part of the planning process.

Growing Demand Among Municipalities

More than ten municipalities and planning firms are already using the platform, while additional local authorities are evaluating OASITY through pilot projects. Since 2024, more than 100 professionals from planning consultancies and municipal planning departments have been trained to use the platform.

Fraunhofer IBP plans to further expand OASITY® in 2027 by adding additional modules for assessing further climate-related risks.



Urban heat islands not only impair quality of life, but can also pose serious health risks, particularly for older adults, children, and people with pre-existing health conditions. © 2013 Tom Wang/Shutterstock

The Fraunhofer-Gesellschaft, headquartered in Germany, is one of the world's leading organizations for applied research. It plays a major role in innovation by prioritizing research on cutting-edge technologies and the transfer of results to industry to strengthen Germany's industrial base and for the benefit of society as a whole. Founded in 1949, the Fraunhofer-Gesellschaft currently operates 74 institutes and research units throughout Germany. Its roughly 30,000 employees, predominantly scientists and engineers, work with an annual business volume of 3.6 billion euros; 3.2 billion euros of this stems from contract research.

Contact

Hanna Müller

Fraunhofer Institute for Building
Physics IBP
Communications
Head of Corporate Communications
Tel. +49 151 70669493
hanna.mueller@ibp.fraunhofer.de

Matthias Winkler

Fraunhofer Institute for Building
Physics IBP
Group Manager Urban Physics
Modelling
Tel. +49 8024 643-287
matthias.winkler@ibp.fraunhofer.de

www.ibp.fraunhofer.de