



Pavilion on the blueFACTORY site in Fribourg

Combatting urban heat islands with a cool modular pavilion

Climate change, human activity and urban building materials are causing our cities to overheat. The ENERGY and TRANSFORM Institutes of the School of Engineering and Architecture of Fribourg (HEIA-FR) have responded to this challenge. The solution they came up with at the Smart Living Lab is a modular pavilion designed to improve the urban microclimate. In summer 2021, the pavilion was installed at four different locations in downtown Fribourg.

The DEMO-MI² project aims to design and implement a mobile microclimate demonstrator to tackle the problem of urban heat islands (UHI). It serves four different purposes: experimentation, research, education and awareness-raising. It features various heat-reduction solutions such as a living roof, awnings that provide more sun protection and a water evaporation system.



Marc Vonlanthen
Professor HEIA-FR, ENERGY Institute

“The solutions we have used have the potential to make urbanisation more sustainable even though their application is still heavily conditioned by building size.”

Principle of urban densification

Inner city densification is a central tenet of Switzerland's Spatial Planning Act. At the same time, urban heat islands (UHI) are becoming more frequent as summers become hotter due to climate change. This phenomenon brings with it a new set of challenges. Given that UHI occur at street or neighbourhood level, measures to mitigate them must be implemented locally.

As Raphaël Compagnon, associate professor at HEIA-FR explains, "Climate change has made extreme heat a major issue again. We therefore wanted to centralise the solutions that already exist to combat this problem." Although the primary purpose of DEMO-MI², as the project is called, is an educational one, the pavilion will also generate hard, actionable data which could help inform future urban planning decisions by the City of Fribourg authorities.

Marc Vonlanthen, co-lead on the project, adds that "The solutions we have used have the potential to make urbanisation more sustainable even though their application is still heavily conditioned by building size. For example, greening solutions are better suited to large areas, while air-based cooling systems could be installed in street furniture. The benches in the pavilion are filled with material which absorbs cool air during the night, then releases it during the day as soon as the ambient temperature exceeds a certain threshold (around 25 degrees Celsius).



Project in brief

Name

DEMO-MI²

Team

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Domains

Well-being and behaviours
Construction technologies

Groups

Institute of Applied Research in Energy
Systems (ENERGY), HEIA-FR
Institute of Architecture: Heritage,
Construction and Users (TRANSFORM), HEIA-FR

Category

Local innovation
Special funding

Partner

City of Fribourg

Start-stop

2020-2021

Keywords

Energy performance
Environmental impact

Website

uhi.smartlivinglab.ch

Sustainable development strategy

The project dovetails with the City of Fribourg sustainable development strategy adopted in 2018. An initial study by HEIA-FR (January 2019 to December 2020) mapped UHI in the city. It found that this phenomenon is especially pronounced in the area around Fribourg central station. The crowdfunded project, which also enjoys the backing of the public authorities, aims to serve as a decision-making and communication tool that will lead to greater awareness of the impact of global warming on urban comfort, human health, and sustainable energy consumption and production.

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