SOLAR SHADING

When schools set an example

The town of Poissy in the suburbs of Paris does not take lightly the subject of health and well-being of its schoolchildren. To avoid the use of air-conditioning, its « Heatwave Plan » provides for the installation of motorised outdoor zip awnings in its 15 schools, the performance of which has been validated by thermodynamic simulations. We went to the site and the results are amazing!

The installation of motorized exterior blinds is the most effective solution to combat overheating of buildings without resorting to air conditioning.

The town of Poissy has decided to tackle the problem of overheating in buildings head-on. Since 2020, its "Heatwave Plan" has included the fitting of external solar shading in its schools to avoid the need for air conditioning. Dominique Bulle, Head of Fluids & Energy for the local administration, looks after the HVAC (heating, ventilation and air conditioning) systems in the public buildings of the town of Poissy, in the Yvelines region (78). «The agent responsible for energy and the elected official in charge of these matters form a pair. One without the other doesn't work, and it is this pairing that enables energy efficiency projects to be carried out and to succeed», explains Dominique Bulle, who is working on this project with Lydie Grimaud, Deputy Mayor for Sustainable Development and Ecological Transition in Poissy.

Upstream thermodynamic studies

«The particularity of this project is that we had thermodynamic studies carried out by the company Alterea in order to compare different solutions to avoid

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The high-performance fabric controls glare while optimizing the supply of natural light.

having to install air conditioning systems. The objective was to achieve less than 3% of occupancy time at +28°C. And it was the high-performance fabric and motorised external blinds solution that proved to be the most efficient,» explains Dominique Bulle. These thermodynamic simulations made it possible to determine the right objective for each façade, some of which were given priority, others not. The ones that covered the windows did not need blinds or even a protective film.

Solar shading objectives for Poissy schools

The project to install solar shading in Poissy schools has four priority objectives:

- To lower the indoor temperature by 10°C compared to the outdoor temperature in hot weather.
- To save 301,000 kWh/year
- To use the RE2020 summer comfort calculation method to achieve a number of summer discomfort Degrees per Hour (DH) of less than 350 DH
- Avoid deployment of air conditioning systems

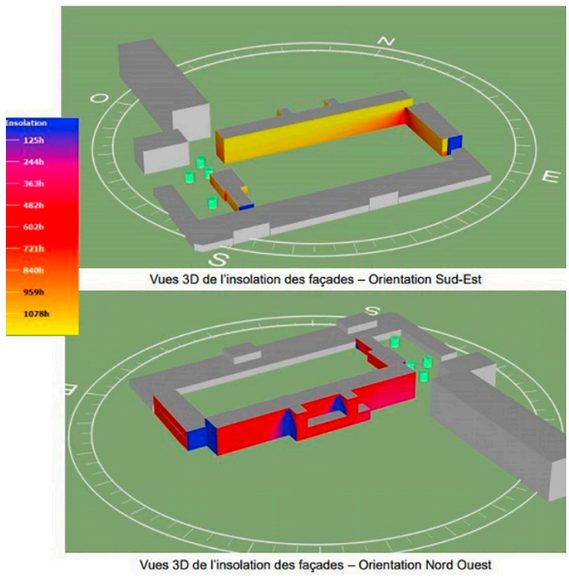
A school under monitoring exceeds the target

To measure the performance of the external blinds, temperature and light sensors were installed in the schools of the first school group to be equipped in summer 2020. The measurement and monitoring of thermal performance was carried out by the company CETAA via a platform for monitoring connected objects on the LoRa network. For example, on 31 July 2020, the outside temperature was 38°C. The measurements taken at that time indicated a temperature of 32°C in an unequipped classroom and 26.9°C in a room equipped with external blinds.

An investment that pays off in two years

A tailor-made system, building by building, school group by school group, for 15 schools in total. The Paris Ouvertures design office was responsible for the specifications of the call for tenders, which was finally won by the company Stores

« Compared to what the installation of air conditioning systems would have cost and their consumption, this investment becomes profitable after about two years ». Dominique Bulle, fluids and energy manager for the city of Poissy.



Dynamic thermal simulation of the Les Sablons school group, whose construction will be carried out during the summer of 2021.

The Somfy io motor is used to operate each of the three blinds in the room independently by wall control.

The small Venetian blinds, less effective than an exterior protection, have been removed.

intervenants

Client
City of Poissy

Implementation
Stores Seas

Installation of 616 wind-resistant external blinds
- Zip Shenker Blinds
- External Screen Classic Satiné 5 500 (320 cm) by Mermet
- Somfy motorisation and wall controls

Total estimated cost
€ 707,000 excluding VAT

Delivery per school group
from 2020 to the end of 2022

●●● Seas based in Rueil-Malmaison (92). The project involves the installation of 616 motorised external zip blinds. «The electrical connection represents 25% of the total cost, with each blind costing around €1,500. It is an investment, but compared to the cost of installing air conditioning systems and their consumption (estimated at €50,000 per year), it pays for itself after about two years,» says Dominique Bulle.

A textbook case

The schools already equipped with the system are attracting interest from teachers and staff. Many are thinking of using this type of shading at home, which also appeals to passers-by and HVAC professionals, notes Dominique Bulle. «We realise that we won't be able to air-condition everything, and these installations are of interest to everyone,» he says. When we visited in June 2021, the outside temperature was 35°C, but in the classrooms, staff room and communal areas, the temperature was quite pleasant and the light was excellent. The installed zip blinds are very quiet. They are quick and easy to operate thanks to their large size (320 cm wide) covering several windows. The individual wall controls allow the teachers to operate each blind independently.

The Les Sablons school group, with around 700 pupils, was equipped during the summer holidays of 2021, a fourth school group during the autumn holidays and by the end of 2022, a total of 15 schools in the various school groups in Poissy will have benefited from this summer thermal renovation operation. This is a real case study that should give ideas to other municipalities. ●

Objectives of the Heatwave Plan - Solar shading for schools in Poissy

1- Lower the indoor temperature by 10°C compared to the outdoor temperature during a heat wave.
2- Save 301,000 kWh/year.
3- Use the summer comfort calculation method of the RE 2020 to reach a number of summer discomfort degree hours (DH) <350.
4- Avoid the deployment of air conditioning systems