

The greener, the less energy consuming

Research addresses the application of green designs in architecture as an alternative to control the excess of sunlight

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In Paris, France, it is already a law: Commercial buildings must have green ceilings or solar panels in their constructions. Sustainable solutions have been increasingly discussed and devised in the major cities of the world. It was precisely the growing proposition of the green curtains as an alternative to control the excess of sunlight inside the buildings that motivated the researcher Minéia Scherer to develop, as a doctoral thesis, the work *Cortinas verdes na Arquitetura: desempenho no controle solar e na eficiência energética de edificações* (Green curtains in Architecture: performance in solar control and energy efficiency of buildings).



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“The increasing use of this type of element in architectural projects has been observed mainly in European and Asian countries. In Brazil, there are not many constructions using green curtain designs. The few occurrences happen to be later adjustments which do not use the green curtain as a properly planned element of the construction project, states Minéia.

The research was developed in three stages: the theoretical study about the theme, the assistance of a field experiment with some species and the accomplishment of computational simulations for the verification of the energy efficiency. The shading capacity of each species was also considered. "The use of climbing vegetation for this purpose has many advantages because it is a natural component that does not absorb heat, as it does with concrete or metals. Instead, the vegetation cools and humidifies the air around it. "

This experiment analyzed four types of climbing vegetation adapted to the climate of the Southern Region of Brazil: *Wisteria*, *Campsis grandiflora*, *Trachelospermum jasminoides*, and *Lonicera japonica*.

The behavior of the each species varied according to the climate situation: "In general, *Wisteria* was the one that had the best performance in southern Brazil, with its subtropical climate. In this way, it can be concluded that the appropriate climbing vegetation selection will depend on each region," she says.

According to the thesis, green curtains can be used in any type of building, whether residential or commercial, single storey or multi-storey, provided good planning is made: "The climbing vegetation can be planted directly on the ground or in large bollards, which makes its use feasible even on upper floors" explains the researcher.

According to Minéia, the incorporated use of these plants into the building project, whether in the form of green curtains or of another type of vertical garden, is a trend of contemporary architectural production, since the benefits for the environment and for the people are constantly being proven.

"The most important contribution of this research is the feasibility demonstration of an alternative system to avoid the excess of sunlight heating, one that uses a component with low environmental impact and that meets the premises of a more sustainable architecture," she notes. According to the researcher, one of the major problems faced by the current architecture model in Brazil is the excessive use of glass and, consequently, the excessive solar energy absorption that turns into heat inside the buildings: "This high thermal load requires an ever-growing use of air-conditioning systems practically all year round, which is often a waste of energy" she adds.

The research "Green Curtains in Architecture: performance in solar control and energy efficiency of buildings" was awarded the 2014 UFRGS *Best Thesis Prize* representing the Social and Applied Sciences area.

PhD Thesis

Title: Green curtains in Architecture: performance in solar control and energy efficiency of buildings ([Cortinas verdes na arquitetura: desempenho no controle solar e na eficiência energética de edificações](#))

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