

## عنوان مقاله:

An Optimal Model for Designing and Executing Windows in Tabriz Residential Buildings to Reduce Energy Consumption

## محل انتشار:

فصلنامه انرژی و محیط زیست ایران، دوره 13، شماره 1 (سال: 1401)

تعداد صفحات اصل مقاله: 12

## نویسندگان:

S. Abdoli Naser - *Department of Architecture, Tabriz Branch, Islamic Azad University, Tabriz, Iran*

F. Haghparast - *Faculty of Architecture and Urbanism, Tabriz Islamic Art University, Tabriz, Iran*

M. Singery - *Department of Architecture and Urbanism, Tabriz Branch, Islamic Azad University, Tabriz, Iran*

H. Sattari Sarbangholi - *Department of Architecture and Urbanism, Tabriz Branch, Islamic Azad University, Tabriz, Iran*

## خلاصه مقاله:

Most of today's buildings, due to improper imitation of the architecture of buildings in other countries, are forced to use more energy to create conditions of thermal comfort. Building windows affect energy efficiency. So, the aim of this research is to be concerned with Tabriz climate; in selecting the proportion and suitable glazing of the windows, in order to access the best design and execute a model to decrease energy consumption. The research approach is to utilize simulation and Design Builder software as a research tool. So, the annual gas consumed in the Building was received from the National Iranian Gas Company and a case study is modeled and after converting the unit from kWh to kg and kg to m<sup>3</sup> and reliability of simulation results. Then, through parametric optimization, eight scenarios in designing windows and through the genetic algorithm, the glazing coating were evaluated. The simulations were performed again and the results index was examined. Eventually, based on the analysis of outputs, according to fixed area, it is more suitable to replace windows with the height of ۱.۵ to ۱.۷۴ meters instead of windows with the height of ۱ or ۱.۲ meters. A window should be replaced with ۲, ۳, ۴ or ۵ windows with the same fixed area. It is desired to superseded triple-glazed glazing with low-emissivity filled with argon gas with clear double-glazed glazing filled with air to reduce energy consumption. The amount of heat losses for the window height of ۱ to ۱.۵m, from one window to .five windows and for the clear double-glazed glazing filled with air were ۲.۰۴%, ۱۱.۱۱%, and ۴۵.۳۶%, respectively

## کلمات کلیدی:

energy consumption, Parametric optimization, Genetic Algorithm, Window, Cold and dry climate of Tabriz

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1379798>



