## A Study on the Wind Energy Produced in the Building Skin Using Piezoelectricity

Authors : Sara Mota Carmo

**Abstract :** Nowadays, there is an increasing demand for buildings to be energetically autonomous through energy generation systems from renewable sources, according to the concept of a net zero energy building (NZEB). In this sense, the present study aims to study the integration of wind energy through piezoelectricity applied to the building skin. As a methodology, a reduced-scale prototype of a building was developed and tested in a wind tunnel, with the four façades monitored by recording the energy produced by each. The applied wind intensities varied between 2m/s and 8m/s and the four façades were compared with each other regarding the energy produced according to the intensity of wind and position in the wind. The results obtained concluded that it was not a sufficient system to generate sources to cover family residential buildings' energy needs. However, piezoelectricity is expanding and can be a promising path for a wind energy system in architecture as a complement to other renewable energy sources.

**Keywords :** adaptative building skin, kinetic façade, wind energy in architecture, NZEB **Conference Title :** ICIBS 2024 : International Conference on Innovations in Building Skins **Conference Location :** Copenhagen, Denmark **Conference Dates :** July 18-19, 2024

1