

## HARMONIOUS INTEGRATION OF COOLING SYSTEMS IN ARCHITECTURAL DESIGN FOR ENHANCED SUSTAINABILITY IN SOLAR INSTALLATIONS

Lucas Figueiredo Ribeiro <sup>1</sup>  
Sandro Dutra e Silva <sup>2</sup>

The integration of cooling systems seamlessly into the architectural design of buildings and solar installations is a key focus of this research. The harmonious fusion of cooling solutions with architectural aesthetics and functionality is essential for maximizing the overall efficiency and sustainability of solar energy applications. A prime example is the integration of building-integrated photovoltaics (BIPV), where solar panels are incorporated into the building's structure, serving both as an energy source and a shading element. In this approach, the solar panels not only generate electricity but also provide natural shading to the building, reducing the need for additional cooling systems. Another illustration is the implementation of green roofs and walls, where vegetation serves as a natural coolant, reducing heat absorption and enhancing thermal comfort within the building. Additionally, innovative designs of solar shading devices, such as dynamic shading systems that automatically adjust their position based on sunlight intensity, seamlessly blend energy efficiency with architectural aesthetics. This research underscores the importance of a holistic approach to the integration of cooling systems, considering the architectural context, environmental impact, and energy savings. By incorporating cooling solutions in a manner that complements the design language and functionality of buildings and solar installations, we can achieve not only enhanced energy efficiency but also aesthetically pleasing and environmentally sustainable structures.

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<sup>1</sup> Mestre, Universidade Evangélica de Goiás - UniEVANGÉLICA, E-mail: [lucfigrib@gmail.com](mailto:lucfigrib@gmail.com)

<sup>2</sup> Pró-reitor de Pós-graduação, Pesquisa, Extensão e Ação Comunitária da UniEVANGÉLICA, [sandrodutr@hotmail.com](mailto:sandrodutr@hotmail.com)