



“Gheorghe Asachi” Technical University of Iasi, Romania



ENERGY EFFICIENCY INTO DESIGN STAGE FOR SUSTAINABLE BUILDING IN ALGERIA: AN INTERDISCIPLINARY APPROACH

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Abstract

Energy efficiency has been a pivotal subject in sustainable construction since the earliest stages of engineering projects, as it integrates architectural strategies such as orientation, compactness, and material choice to reduce energy consumption and environmental impacts. In the present study, an interdisciplinary approach is employed to analyze how architects in Algeria incorporate these factors into the building design process. The interaction of political, managerial, and technical dimensions is examined, as these strongly dictate energy-related decision-making and the success of efficiency measures. To provide empirical insights, a quantitative survey of 256 Algerian architects was conducted, representing a significant case study for identifying the main challenges to the energy transition. The study seeks to evaluate architects' involvement in both national and international contexts of energy efficiency, their perspectives on architectural and technical solutions for improving building performance, and the managerial constraints they face during the design process. Based on these results, a set of guidelines is proposed to facilitate the incorporation of energy efficiency into architectural practice and contribute to the broader goals of sustainable development in Algeria. Findings reveal that many architects acknowledge the importance of energy efficiency but face barriers linked to political frameworks, limited technical resources, budgetary restrictions, and communication management within project teams. While strategies such as compact design, improved insulation, and passive ventilation are recognized, their systematic integration into practice remains insufficient. Moreover, the adoption of new technologies, including renewable energy systems, is limited due to financial constraints and a lack of locally manufactured equipment. By combining political, managerial, and technical insights, this study highlights the complexity of embedding energy efficiency into the architectural design stage. It emphasizes the need for stronger collaboration among stakeholders, improved training, and clearer regulatory frameworks to achieve the energy transition. Ultimately, the work contributes to identifying practical pathways for integrating energy efficiency into sustainable building practices in Algeria and other developing nations.

Key words: building design, energy decision, energy efficiency, energy transition, sustainable building

Received: March, 2023; Revised final: January, 2025; Accepted: January, 2025; Published in final edited form: September, 2025

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