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| # | **Sofia Vekri**<br>Civil Engineer, M. Eng |  |
| Title: | Civil Engineer in NOVA CONSTRUCTIONS, Athens, Greece | |
| email: | sophiavekri@gmail.com | |
| Presentation title: | **Impact on Energy and Carbon Emissions of Transparent Elements in an Office Building through Parametric Analysis** | |

The study examines the impact of transparent building elements on the energy performance and carbon emissions of an existing six-storey open plan office building, with a total area of approximately 9.636 m2, located in the centre of Athens, Greece.

Using Parametric Analysis in DesignBuilder (Version 7.3.040), the research investigated key glazing characteristics – U-values (Uw), Solar Heat Gain Coefficient (SHGC), Visible Transmittance and Window-to-Wall Ratio – alongside two lighting control levels (300 lux and 500 lux) to identify optimal design strategies that balance energy efficiency with minimized carbon emissions (operational and carbon footprint). The operational and embodied carbon footprint was assessed over a 50-year life cycle and a "cradle-to-grave" analysis using OneClick LCA. Finally, a detailed regression and sensitivity analysis was conducted to elucidate the relationships between the glazing parameters and the energy performance of the building.

The findings highlight that low Uw values mitigate thermal losses, reducing heating loads. WWR and site orientation strongly influence daylight utilization, with optimal scenarios achieving significant reductions in lighting energy. The Regression and Sensitivity Analysis which was conducted further revealed that the interaction of SHGC with WWR can lower cooling energy, while the combination of Uw and WWR affects heating loads. Overall, the study demonstrates that careful selection of glazing characteristics, WWR and orientation can effectively balance energy efficiency with reduced carbon emissions, supporting more sustainable architectural practices.

Short CV:

Sofia Vekri is a Civil Engineer, currently employed at NOVA CONSTRUCTIONS, primarily responsible for the contractor agreements and the payment procedures based on project process for sustainable residential and hotel developments. Holder of a MSc in "Production and Energy Management" from the School of Electrical and Computer Engineering (NTUA) and a MSc in International Tourism Management and Marketing (University of Nottingham).

| CV: | |
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Civil Engineer, specialized in the Geotechnical Field, currently employed at a Construction and Real Estate Company, primarily responsible for the contractor agreements and the payment procedures based on project process for sustainable residential and hotel developments. Holder of an Interdisciplinary Master's Degree in "Production and Energy Management" from the School of Electrical and Computer Engineering at the National Technical University of Athens, as well as a Master's Degree in International Tourism Management and Marketing from the University of Nottingham, UK.

Work Experience

Cost Engineer, NOVA CONSTRUCTIONS, Athens

March 2025 – Present

- Responsible for managing contractor agreements for residential and hotel developments.
- Oversee contractor certifications and payment procedures based on project progress, maintaining direct communication with site engineers and subcontractors.

Civil Engineer, CONFIDE LTD, Athens

September 2024 – March 2025

- Preparation of tender documents for the Project "2024.002 E-mobility Project Infrastructure Works" at Athens International Airport (Budget: €3,000,000).
- Preparation of tender documents for the construction of a Hydrogen Refueling Station at the existed Akrata Service Area on the Olympia Odos Motorway.
- Contribution to the study for the construction of the Hydrogen Refueling Station at the Akrata Service Area on the Olympia Odos Motorway.

Civil Engineer, I. Stamatoukos & Associates Engineers E.T.M.E., Athens

July 2023 – August 2024

- 2D AutuCAD drafting and structural adequacy assessment of the existing Low Voltage Network in Greek cities for the purpose of aerial fiber optic cable connection.
- 2D drafting of the existing Medium Voltage Network using Civil 3D.
- Compilation of summary tables using Microsoft Excel.

Education

MSc in Production and Energy Management - 8.29/10
School of Electrical and Computer Engineering, National Technical University of Athens (NTUA)
September 2022 – October 2024
Thesis Title: Impact on Energy and Carbon Emissions of Transparent Elements in an Office Building through Parametric Analysis
Thesis Grade: 10/10

MSc in International Tourism Management and Marketing – Pass with Merit
Business School, University of Nottingham
September 2019 – September 2020
Thesis Title: How does Tourism Crisis Influence Tourism Consumption Behavior towards International and Domestic Destinations during and after the COVID-19 pandemic?
Thesis Grade: 70/100

M.Eng in Civil Engineering – 7.39/10
School of Engineering, Democritus University of Thrace (DUTh)
September 2013 – July 2019
Thesis Title: Investigation of Semi-Empirical and Simplified Methods for Determining theSeismic Response of Earth and Rockfill Dams and Comparison with 2D Dynamic Analyses
Thesis Grade: 10/10