

## Re-Analyzing Energy-Conscious Design

**Authors :** Svetlana Pushkar, Oleg Verbitsky

**Abstract :** An energy-conscious design for a classroom in a hot-humid climate is reanalyzed. The hypothesis of this study is that use of photovoltaic (PV) electricity generation in building operation energy consumption will lead to re-analysis of the energy-conscious design. Therefore, the objective of this study is to reanalyze the energy-conscious design by evaluating the environmental impact of operational energy with PV electrical generation. Using the hierarchical design structure of Eco-indicator 99, the alternatives for energy-conscious variables are statistically evaluated by applying a two-stage nested (hierarchical) ANOVA. The recommendations for the preferred solutions for application of glazing types, wall insulation, roof insulation, window size, roof mass, and window shading design alternatives were changed (for example, glazing type recommendations were changed from low-emissivity glazing, green, and double-glazed windows to low-emissivity glazing only), whereas the applications for the lighting control system and infiltration are not changed. Such analysis of operational energy can be defined as environment-conscious analysis.

**Keywords :** ANOVA, Eco-Indicator 99, energy-conscious design, hot-humid climate, photovoltaic

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