

Energetic Echoes: A Commencement into Exploring Building Materials and Their Embodied Energy in Old Downtown Amman with a Focus on Process System Engineering and Electronic Elements

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Abstract:

This research focuses on exploring the relationship between sustainable architecture and urban heritage, delving into the vitality of Amman's old downtown. With a firm focus on the intersection of process systems engineering and electronic components, our study amplifies the potential energy within the construction materials of ancient buildings. As the world grapples with environmental challenges, understanding the energy embodied in building materials is emerging as a pivotal step towards environmentally conscious design. We carefully examine the life cycle of materials, considering both operational and embodied energy. Recognizing the profound impact of material choice on a building's energy profile, our research calls for a measured approach before making design decisions.

The contextual background of Amman's old city center provides a unique setting, offering insight into the challenges and opportunities inherent in the preservation of ancient buildings. Through a hybrid output-input approach, we measure the embodied energy of old downtown's most prevalent building materials by using arithmetic matrices, ensuring a comprehensive understanding of their environmental footprint.

Our findings underscore the critical role of embodied energy in shaping buildings' overall consumption and environmental impact. The methodological rigor of our approach, leveraging energy flow diagrams to map the complex journey from raw material to construction site, establishes a reliable framework for proactive decision-making in sustainable design. In conclusion, this research calls for a paradigm shift in material selection and urges the implementation of a comprehensive code tailored to Jordan's unique energy scene.

Keywords- Process, Materials, Life cycle, Embodied energy.