

MOHAMED AADEL ABBAS MOHAMED SHARIF KARIMPOUR: ALTERNATIVE RENEWABLE  
ENERGY FOR AIRPORTS IN UNITED ARAB EMIRATES

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This thesis explores into alternative renewable energy solutions for airports in the United Arab Emirates (UAE). With a focus on analysing and recommending best practices, the study navigates through various avenues within the renewable energy landscape, aiming to align with the sustainability goals of the UAE's aviation industry. In the pursuit of its objectives, the research evaluates the existing state of renewable energy adoption within the UAE's aviation sector, with particular emphasis on its airports. Factors such as environmental impact, economic feasibility, and scalability are thoroughly investigated to provide a comprehensive understanding of the challenges and opportunities associated with integrating renewable energy sources into airport operations.

The study conducts a comprehensive analysis of available technologies and their suitability for integration into airport infrastructure, aiming to provide insights into the feasibility and challenges of renewable energy implementation. SWOT analysis was then applied to assess the adoption of alternative renewable energy in airports. Additionally, a circuit simulation was used to test Piezoelectricity as an alternative renewable source. This concluded with Piezoelectricity being a viable option compared to other alternative renewable sources such as solar, wind, and hydropower. This is due to its many benefits such as minimal environmental impact and maintenance, versatility to be implemented into various airport applications (airport runways), and its simple installation. There are some drawbacks with using piezoelectricity as an alternative renewable energy source such as the requirement of a much durable piezoelectric material that would be capable of withstanding heavy loads and optimizing the energy conversion efficiency. The findings are expected to guide stakeholders, policymakers, and industry players towards a more sustainable and environmentally conscious future for airports in the UAE.

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