

## Electricity Sector's Status in Lebanon and Portfolio Optimization for the Future Electricity Generation Scenarios

**Authors :** Nour Wehbe

**Abstract :** The Lebanese electricity sector is at the heart of a deep crisis. Electricity in Lebanon is supplied by Électricité du Liban (EdL) which has to suffer from technical and financial deficiencies for decades and proved to be insufficient and deficient as the demand still exceeds the supply. As a result, backup generation is widespread throughout Lebanon. The sector costs massive government resources and, on top of it, consumers pay massive additional amounts for satisfying their electrical needs. While the developed countries have been investing in renewable energy for the past two decades, the Lebanese government realizes the importance of adopting such energy sourcing strategies for the upgrade of the electricity sector in the country. The diversification of the national electricity generation mix has increased considerably in Lebanon's energy planning agenda, especially that a detailed review of the energy potential in Lebanon has revealed a great potential of solar and wind energy resources, a considerable potential of biomass resource, and an important hydraulic potential in Lebanon. This paper presents a review of the energy status of Lebanon, and illustrates a detailed review of the EDL structure with the existing problems and recommended solutions. In addition, scenarios reflecting implementation of policy projects are presented, and conclusions are drawn on the usefulness of a proposed evaluation methodology and the effectiveness of the adopted new energy policy for the electrical sector in Lebanon.

**Keywords :** EdL Electricite du Liban, portfolio optimization, electricity generation mix, mean-variance approach

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