

**UNIVERSITI TEKNOLOGI MARA
CAWANGAN PULAU PINANG**

**ANALYSIS DEMAND SIDE MANAGEMENT FOR
MICROGRID INTERCONNECTION USING PV-
BATTERY ENERGY STORAGE SYSTEM**

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

This project report analyse the integration of photovoltaic (PV) systems and battery energy storage systems (BESS) with Demand Side Management (DSM) strategy enhance energy consumption efficiency and reduce reliance on grid electricity. Simulations were performed using Xendee software to evaluate energy dispatch patterns, load profiles, and the financial performance. The research focused on optimising renewable energy usage while reducing operational expenses and dependence on the grid. The methodology entailed importing empirical energy demand data, photovoltaic generating profiles, and battery parameters into Xendee to simulate various scenarios and analyse system performance. Research indicated that although photovoltaic systems substantially reduce dependence on the grid during daylight, battery capacity and dispatch techniques are essential for meeting peak load requirements. The findings highlight the significance of Demand-Side Management in optimising load profiles and achieving cost reductions. The report concludes with recommendations to enhance system efficiency by increasing photovoltaic capacity, optimising battery utilisation, and implementing advanced demand-side management techniques.

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