UNIVERSITI TEKNOLOGI MARA
CAWANGAN PULAU PINANG

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

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February 2025

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.

ACKNOWLEDGEMENT

I would want to express my sincere gratitude to all who assisted and supported me in completing this report project. The project would not have been possible without their assistance and motivation.

Firstly, I wish to express my appreciation to Allah S.W.T., the Almighty, for His blessings and guidance, which enabled me to complete my report without any difficulties. Additionally, my parents consistently prayed for me and provided support from afar. I wish to convey my profound appreciation to my supervisor, PM. Ir. Dr. Mohd Najib Mohd Hussain, whose guidance and expertise were important in shaping the direction of this work. His continual support and constructive criticism enabled me to remain focused and motivated me to excel.

I would want to express my gratitude to my friends and colleagues for generously giving their resources and knowledge. This endeavour was a collaborative and rewarding experience due to their willingness to support and cooperate. I sincerely appreciate it.

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