# RESEARCH CATALOGUE

ENERGY TECHNOLOGY





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### LOAD PROFILES OF BUILDINGS EQUIPPED WITH ROOFTOP PV AND ENERGY STORAGE SYSTEMS



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This research work relates to self-consumption of energy in households based on rooftop PV systems coupled with energy storage systems. There has been a rapid development in PV technology over the past decades making it a promising source of power. Therefore, investment in PV power generation has grown rapidly over the past years. However, for conventional uses, excess energy from rooftop PV systems cannot be stored at present. Energy storage systems are generally considered for electrical charging. Moreover, the development and marketing of energy storage systems, with significant price reductions, have been seen as a stimulator for a solar energy revolution and have created high expectations in this sector. In the past, many works have focused on investigating PV systems with energy storage in off-grid systems.

In this work, grid-connected rooftop PV systems coupled with energy storage systems were installed for physical experimentations. The load profile characteristics of the residential buildings equipped with PV rooftop systems with and without energy storage systems were compared. The load profiles of buildings in different sections were discussed. The influence of rooftop PV self-consumption with energy storage was analyzed and criticized. Also, the financial payback periods from the different structures of electricity tariffs using the models in Thailand were analyzed and compared.



## This research work was performed as part of my master studies during 2016-2018. I had an opportunity during that time to join the 2018 International Conference on Engineering,

Technology, and Applied Science in Japan. Outputs of this research work were published in the Suan Sunandha Science and Technology Journal.