
JOURNAL OF THE ASIA RESEARCH CENTRE

YANGON UNIVERSITY

Vol.6, No.1 & 2

Published by

The Asia Research Centre, Yangon University

Yangon, MYANMAR

JOURNAL OF THE ASIA RESEARCH CENTRE

YANGON UNIVERSITY

Vol.6, No.1& 2

Published by

The Asia Research Centre, Yangon University

Yangon, MYANMAR

First Edition: January 2017

200 copies

**The publication of this journal was funded by the Asia Research Centre,
Yangon University**

Published by

The Asia Research Centre, Yangon University

MYANMAR

Tel: 095-1-536503, Fax: 95-1-527067

Email: contact@uy.edu.mm

Foreword

University of Yangon (UY) makes an all-out effort to be a leading higher educational institution in Myanmar as a Flagship university on par with regional counterparts and in line with international trends. UY therefore expands the frontiers of knowledge by developing research culture.

UY created a research-teaching nexus namely Universities' Research Centre (URC-UY) where research informs and enhances teaching agenda. University education is fundamentally about how to solve problems based on data and/or logical thought. Those involved in research are better at imparting these skills to students with inquiring minds. The Korea Foundation for Advanced Studies (KFAS) has been supporting research activities in UY through the Asia Research Centre (ARC-UY). To a researcher in UY, ARC-UY and URC-UY should be seen as two sides of the same coin in much the same way as financial support and research activity should be regarded.

Research is only meaningful if it is communicated, so the research outcomes must be published and contribute to the body of knowledge; even better if research outcomes can be impactful through commercialization or implementation. This journal proudly presents 15 research papers resulted from the outstanding research projects carried out by the academic departments of UY.

I would like to express my appreciation and congratulations on the concerted effort of the researchers who have made a great deal of excellent contribution to this issue. I also would like to to express my heartfelt thanks to Mr. Park In-Kook, President of the KFAS for his continued support to the ARC-UY.

Prof. Dr Pho Kaung
Rector, University of Yangon

Development of Optimized PV-Backup System in University of Yangon

May Thet Mon², Aye Aye Thant¹ and Khin Khin Win² and Pho Kaung*

¹Universities' Research Centre, University of Yangon

²Department of Physics, University of Yangon

Abstract

Interest in PV systems is increasing and the installation of PV systems that are interactive with the utility grid is accelerating. Advanced PV system technologies include inverters, controllers, related balance of system, and energy management hardware. In this research, the Solar Energy Grid Integration System SEGIS architecture has been developed. The incorporated features such as voltage regulation, backup power and frequency regulation have been studied. PV system has been modified in coupling with generator backup system as well as energy storage unit in this SEGIS design.

Keywords: energy storage; grid Inteiration; PV system; SEGIS design; solar energy

I. Introduction

This study is being conducted with the aim of developing a standard procedure for the design of large-scale institutional grid-connected solar PV (Photovoltaic) systems using the roof of building. The standard procedure developed will be validated in the design of a 16.5 kW grid-connected solar PV system for six-story research building of University of Yangon (UY). The study is necessary because most of the country have experienced a number of power crises over the last two decades, mainly due to the heavy reliance on hydroelectric power which is more often than not dependent on the rain fall pattern of the country. It has been estimated that grid electricity would grow for the country's electricity generation from renewable energy and this will come mainly from solar, small and medium sized hydro, wind, biomass and municipal solid wastes.

Grid-connected solar photovoltaic (PV) systems employ the direct conversion of sunlight into electricity which is fed directly into the electricity grid without storage in batteries. This will be a very good way to boost the existing electricity production capacity in the country, which is mainly from hydro and thermal sources. This will contribute positively to the worsening energy situation in the country. Solar energy, being a renewable source, will also provide energy without pollutants and greenhouse gas emissions. This can go a long way to help mitigate the adverse effect of global warming as well as contribute to sustainable energy development. The main objective of the project is to design approximately a 16.5 kW grid-connected solar photovoltaic system for six-story research building of UY using the roof of the building.

II. A Grid-Connected Photovoltaic Power System

A grid-connected photovoltaic power system or grid-connected PV power system is an electric generating solar PV power system that is connected to the utility grid (the public electricity grid). This energy may be shared by a residential or commercial building before or after the revenue measurement point. A grid-connected PV system consists of solar panels, one or several inverters, a power conditioning unit and grid

* Pho Kaung, Universities' Research Centre, University of Yangon

