



Sustainable
Development
Report 2021-2022
**Affordable &
Clean Energy**

Affordable & Clean Energy

Prince Sultan University taken efforts on bringing the environment pollution free and contribute towards climate change. As an important stakeholder, PSU contributes towards the achievement of sustainable cities and communities through various events, practices, and research. It regularly organizes events and exhibitions for students and employees to promote the affordable, clean and sustainable energy for all.

The strong commitment can be witnessed from the type of support provided in events related to clean energy, EV and the sustainable practices followed for sustainable PSU campus to promote renewable energy and energy efficiency, research contribution on microgrid and EV, etc. Moreover, the integration of clean and affordable energy as an important topic is endorsed in our curriculum and outreach.

Affordable & Clean Energy

Renewable Energy lab, PSU is showing a serious commitment to encourage its researchers to increase their productivity in this field.



Dr Umashankar
Subramaniam

Power electronics for green energy conversion

Authors Mahajan Sagar Bhaskar, Nikita Gupta, Sanjeevikumar Padmanaban, Jens Bo Holm-Nielsen, Umashankar Subramaniam

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Description POWER ELECTRONICS for GREEN ENERGY CONVERSION Written and edited by a team of renowned experts, this exciting new volume explores the concepts and practical applications of power electronics for green energy conversion, going into great detail with ample examples, for the engineer, scientist, or student. Power electronics has emerged as one of the most important technologies in the world and will play a big role in the conversion of the present power grid systems into smart grids. Applications like HVDC systems, FACTS devices, uninterruptible power systems, and renewable energy systems totally rely on advances in power electronic devices and control systems. Further, the need for renewable energy continues to grow, and the complete departure of fossil fuels and nuclear energy is not unrealistic thanks to power electronics. Therefore, the increasingly more important role of power electronics in the power sector industry remains paramount. This groundbreaking new volume aims to cover these topics and trends of power electronic converters, bridging the research gap on green energy conversion system architectures, controls, and protection challenges to enable their wide-scale implementation. Covering not only the concepts of all of these topics, the editors and contributors describe real-world implementation of these ideas and how they can be used for practical applications. Whether for the engineer, scientist, researcher, or student, this outstanding contribution to the science is a must-have for any library.

PAPER • OPEN ACCESS

Design and realization of smart energy storage for Standalone PV system

D. Manu¹, S.G. Shorabh¹, O.V. Gnana Swathika¹, S. Umadevi²
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Author affiliations

- ¹ School of Electrical Engineering, VIT Chennai, India
- ² Department of Communications and Networks, Renewable Energy Engineering, Prince Sultan University, Riyadh 11586, Saudi Arabia

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Research Article

A Practical Approach for Predicting Power in a Small-Scale Off-Grid Photovoltaic System using Machine Learning Algorithms

Aadyasha Patel¹, O. V. Gnana Swathika¹, Umashankar Subramaniam^{2,3},
T. Sudhakar Babu⁴, Alok Tripathi¹, Samridha Nag¹, Alagar Karthick⁵,
and M. Muhibbullah⁶

- ¹School of Electrical Engineering, VIT Chennai, Chennai 600127, India
²Department of Communications and Networks, Renewable Energy Laboratory, College of Engineering, Prince Sultan University, Riyadh 11586, Saudi Arabia
³Department of Energy and Environmental Engineering, Saveetha School of Engineering, Saveetha Institute of Medical and Technical Sciences, Saveetha Nagar, Thandalam, Chennai, 602105 Tamilnadu, India
⁴Department of Electrical and Electronics Engineering, Chaitanya Bharathi Institute of Technology (CBIT), Hyderabad 500075, India
⁵Renewable Energy Lab, Department of Electrical and Electronics Engineering, KPR Institute of Engineering and Technology, 641407, Coimbatore, Tamilnadu, India
⁶Department of Electrical and Electronic Engineering, Bangladesh University, Dhaka 1207, Bangladesh

Correspondence should be addressed to M. Muhibbullah; m.muhibbullah@bu.edu.bd

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Climate change and the energy crisis is substantially motivated the use and development of renewable energy resources. Solar power generation is being identified as the most promising and abundant source for bulk power generation. However, solar photovoltaic panel is heavily dependent on meteorological data of the installation site and weather fluctuations. To overcome these issues, collecting performance data at the remotely installed photovoltaic panel and predicting future power generation is important. The key objective of this paper is to develop a scaled-down prototype of an IoT-enabled datalogger for photovoltaic system that is installed in a remote location where human intervention is not possible due to harsh weather conditions or other circumstances. An Internet of Things platform is used to store and visualize the captured data from a standalone photovoltaic system. The collected data from the datalogger is used as a training set for machine learning algorithms. The estimation of power generation is done by a linear regression algorithm. The results are compared with results obtained by another machine learning algorithm such as polynomial regression and case-based reasoning. Further, a website is developed wherein the user can key in the date and time. The output of that transaction is predicted temperature, humidity, and forecasted power generation of the specific standalone photovoltaic system. The presented results and obtained characteristics confirm the superiority of the proposed techniques in predicting power generation.

1. Introduction

Renewable or nonconventional sources of energy are something that replenishes itself at the speed of its consumption. Some examples of renewable energy are solar, wind, tidal, waves, and geothermal. Renewable energy ventures are being

undertaken in developed as well as in developing countries. The majority of the nonconventional energy sources are used to get electricity, which is more efficient, cleaner, and safe to the environment, and is cost-effective. Among all the nonconventional forms of energy, solar energy is most abundantly found



Journal by MDPI

Energy Transition, Utilization and Management to

Message from the Guest Editors

This Special Issue seeks to contribute to the Sustainable Development Agenda through enhanced scientific and multi-disciplinary knowledge for identifying an efficient, economical and effective approach that also promotes environmental goals as well as social equity. We, therefore, invite papers on novel technical developments, reviews, case studies, and analytical as well as assessment papers from different disciplines, which could potentially hasten the progress in sustainability, especially in the energy sector, transportation sector and industrial sector in the context of sustainable energy. Further considerations of the SDG 7 assessment, strategical analysis and policy implications to support energy sustainability will be substantial.



Special Issue

List of university's achievements to the SDG



International Webinar on Recent developments in high voltage transmission and Capabilities of GCC Electrical Testing Laboratory



DR. VASUDEV NAGARAJU

GCC Electrical Testing Laboratory will be a world class Electrical Product Testing and Services Hub in the GCC and MENA region, Independent authority for testing and certifying High-Voltage, Medium-Voltage and Low-Voltage electrical equipment, Act as a third party for failure investigations and arbitration, provide Low Voltage calibration services for electrical equipment and testing tools and certification courses for engineers and technicians.

TECHNICAL CONSULTANT
GCC ELECTRICAL TESTING
LABORATORY, KSA
ADDITIONAL DIRECTOR
(Rtd) at CPRI



Date: 29th March, 2022
Time: 4:30 PM (KSA)



Contact:
Mr. AbdulRahman Almujaheed, 219211224@psu.edu.sa
Mr. Mohammed Alghamdi, 219110748@psu.edu.sa
Dr. Umashankar Subramaniam, usubramaniam@psu.edu.sa
Dr. Mahajan Sagar Bhaskar, smahajan@psu.edu.sa
Dr. Dhafer Almkhles, dalmakhles@psu.edu.sa
Eng. Sivakumar Selvam, sselvam@psu.edu.sa

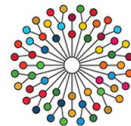


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ICSDI 2022

INTERNATIONAL CONFERENCE ON SUSTAINABILITY: DEVELOPMENTS AND INNOVATIONS

February 19 - 22, 2022 - Riyadh, KSA



ICSDI 2022

INTERNATIONAL CONFERENCE ON SUSTAINABILITY DEVELOPMENTS AND INNOVATIONS

19-22 FEBRUARY 2022 PRINCE SULTAN UNIVERSITY
RIYADH, SAUDI ARABIA



International Webinar on Role of Battery Energy Storage Systems in Energy Transition From Fossil Fuels to Renewables



Eng. Selvakumar
Business Head at POWER
PROJECTS, Chennai,
Tamilnadu, India

Power System is in transition from fossil fuel to renewables for environmental and economic reasons. This Transition results in many challenges to power system design and operation. Frequency regulation, Voltage regulation, Generator ramp up / down requirements, Fault withstand capability, Rigidity of the grid, Protection are few key impacts. There are many Renew alone projects are aimed across the world and in such cases the intensity challenges is extremely high. Energy Storage is the best possible option to resolve the issues and selecting the right type of energy storage is the key. Though they are many energy storage options available Battery energy storage system looks technically feasible and commercially viable at this stage. The session address the key challenges along with solution by from Battery Energy Storage. Session also brings out few real time case study outcome and highlight the simulation requirements at the early stage of the projects to choose the optimal sizing and configuration of BESS.

Date: 3rd March, 2022
Time: 4:30 PM (KSA)



Contact:
Mr. AbdulRahman Almujaheed, 219211224@psu.edu.sa
Mr. Mohammed Alghamdi, 219110748@psu.edu.sa
Dr. Umashankar Subramaniam, usubramaniam@psu.edu.sa
Dr. Mahajan Sagar Bhaskar, smahajan@psu.edu.sa
Dr. Dhafer Almkhles, dalmakhles@psu.edu.sa
Eng. Sivakumar Selvam, sselvam@psu.edu.sa



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Promote pledge on 100 per cent renewable energy (4.6%)

PSU's commitment to SDG 2030

PSU is committed to United Nations Sustainable Development Goals (SDGs) through effective institutional resource management, innovative teaching and learning, research, national and international partnerships, continuous studies, and outreach. PSU shall undertake the following activities: form higher and steering committees, evaluate each SDG, formulate and develop related SDG policies, conduct awareness campaigns to the PSU community, establish a sustainability office, identify the SDGs related to each college, program, and course, and lab centers at PSU, and implement sustainability-related initiatives.

Vision

Prince Sultan University strives to support Saudi Arabia's Vision 2030 and the United Nations Sustainable Development Goals (SDGs) by paving the way for higher education in KSA and Middle East.

Mission

Supporting the Saudi Arabia's Vision 2030 and the PSU's strategic directions, PSU aligns its mission with SDGs by providing quality education, sustainability initiatives, lifelong learning, scientific research, and community service.