# Volume 2, Book 29, 2022, IIP Proceedings

# Futuristic Trends in Renewable & Sustainable Energy





Futuristic Trends in

# Renewable &

# SUSTAINABLE ENERGY

Volume 2, Book 29, 2022, IIP Proceedings



### Title of the Book: Futuristic Trends in Renewable & Sustainable Energy

### Edition: Volume 2, Book 29, 2022, IIP Proceedings

### **Copyright © 2022 Authors**

No part of this book may be reproduced or transmitted in any form by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owners and publisher.

### Disclaimer

The authors are solely responsible for the contents published in this book. The publisher or editors do not take any responsibility for the same in any manner. Errors, if any, are purely unintentional and readers are requested to communicate such errors to the editors or publishers to avoid discrepancies in future.

### ISBN: 978-93-95632-89-8

**Publisher, Printed at & Distribution by:** Selfypage Developers Pvt. Ltd., Pushpagiri Complex, Beside SBI Housing Board, K.M. Road Chikkamagaluru, Karnataka. Tel.: +91-8861518868 E-mail: info@iiponline.org

**IMPRINT:** I I P Iterative International Publishers

# PREFACE

Renewable and sustainable energy Book series aims to bring together leading academic scientists, researchers and research scholars to publish their experiences and research results on all aspects of Renewable and sustainable energy. It also provides a premier interdisciplinary platform for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered and solutions adopted in the specified fields. High quality research contributions describing original and unpublished results of conceptual, constructive, empirical, experimental, or theoretical work in all areas of Renewable and sustainable energy are cordially invited for publication. Authors are solicited to contribute to the book series by submitting articles that illustrate research results, projects, surveying works and industrial experiences that describe significant advances in the following areas, but are not limited to

- 1. Solar Energy
- 2. Wind Energy
- 3. Sea Power
- 4. Hydroelectric Power
- 5. Thermal and Recycling
- 6. Biomass
- 7. Command and control systems for RE
- 8. Eco-Design
- 9. Transportation generation
- 10. Distribution Power System
- 11. Batteries and energy storage
- 12. Energy harvesting
- 13. Renewable energy for IT equipment
- 14. Green technology
- 15. Hydrogen energy storage
- 16. Energy efficiency
- 17. Smart Grid
- 18. Water, food, and energy nexus
- 19. PV and Water pumping
- 20. Desalination and advanced water treatment

# **EDITORIAL BOARD MEMBERS**

### Dr. Deepjyoti Mech

Assistant Professor, Department of Petroleum Engineering Presidency University Bengaluru, Karnataka, India

### Dr. Bibhabasu Mohanty

Assistant Professor Environmental Science Department SAL Institute of Technology and Engineering Research Ahmedabad, Gujarat, India

### Dr. S. D. Sundarsingh Jebaseelan

Associate Professor, Electrical & Electronics Engineering Department Sathyabama University Chennai, Tamilnadu, India

### Sunam Saha

Assistant Professor, Electrical and Electronics Engineering Adamas University Jabalpur, Madhya Pradesh

### Sreehari S

Research Scholar Centre for Sustainable Technologies Department Ulster University Northern Ireland, United Kingdom

### Dr. RajeshKumar

Associate Professor, Chemistry Department Prabhat Engineering College Kanpur Dehat, Uttar Pradesh, India

### Dnyaneshwar Kisan Kulal

Assistance Professor, Chemistry Department Ramnarain Ruia Autonomous College Mumbai, Maharashtra, India

### Satyendra Vishwakarma

Assistant Professor Department of Electrical Engineering School of Engineering & Architecture Lucknow, Uttar Pradesh, India

### Dhanaselvam J

Assistant Professor, Renewable Energy Management System Department Sri Krishna College of Technology Kovaipudur, Tamil Nadu, india

### Dr. Sayyed Juned Allabaksh

HOD, Environmental Science Department Arts, Commerce and Science College Palghar, Maharashtra, India

### Dr. Sukhendu Jana

Assistant Professor Thermal Stability Department Meghnad Saha Institute of Technology Kolkata, West Bengal , India

### Dr. Sonu Kumar

Research Scholar Electronics and Communication Department K L University, Vaddeswaram Vaddeswaram, Andhra Pradesh, India

### Mit Patel

Assistant Professor, Mechanical Department Silver oak College of Engineering & Technology Ahmedabad, Gujarat, India

### Nikhilesh Sil

Assistant Professor, Department of Mathematics Narula Institute of Technology Agarpara, Kolkat, West Bengal, India

### Dr. Man Vir Singh

Associate Professor, Chemistry Department Dev Bhoomi Uttarakhand University Naugaon, Uttarakhand, India

### Subash Ranjan Kabat

Assistant Professor Electrical Engineering Department RITE Bhubaneswar, Orissa, India

### Dr. Trupti Jagdeo Dabe

Assistant Professor, Architecture and Design Priyadarshani Institute of Architecture and Design Studies Nagpur, Maharashtra, India

### Mohd. Asif

Assistant Professor, Mechanical Engineering Anjuman-I-Islam's Kalsekar Technical Campus Mumbai, Maharashtra, India

### Dr. Mehulkumar Laljibhai Savaliya

Assistant Professor, Chemistry Atmiya University Gujarat, India

### Siddappaji. M. R

Assistant Professor, EEE Sir Mokshagundam Visvesvaraya Institute of Technology Yelahanka, Bengaluru, Karnataka, India

### Dr. Cheryl Venan Dias

Assistant Professor, Management S.S Dempo College of Commerce and Economics Bambolim, Goa, India

### Renu

Assistant Professor, Chemical Engineering Parul University Waghodia, Gujarat, India

### Archana Mishra

Research Scientist Seaweed-based Biorefinery and Products Development Indian Institute of Technology, Roorkee Roorkee, Uttarakhand, India

### Dr. Deepti Pande Rana

Associate Professor, Architecture Amity School of Architecture and Planning Noida, Uttar Pradesh, India

### Dr. Saikumar Manchala

Postdoctoral Researcher Chemistry and Nanoscience College of Natural Sciences Seoul, Korea

# CONTENTS

PART 1	Page No.
<b>Chapter 1</b> ENHANCEMENT OF PERFORMANCE AND EFFICENCY OF CONVENTIONALVERTICAL AXIS WIND TURNBINE SYSTEM BY MODIFYING THE TUBINE TO INCOPERATING THE PERMANENT MAGNET PROPELLING PEONOMENON	1-18
<b>Chapter 2</b> REAL TIME MONITORING AND ANALYSIS OF SMART MICRO-GRID USING PHASOR BASED SENSORS	19-26
<b>Chapter 3</b> GREEN NANOPARTICLES FOR SUSTAINABLE OIL RECOVERY	27-37
<b>Chapter 4</b> NON DAMAGING DRILLING FLUIDS FOR A SUSTAINABLE FUTURE OF OIL & GAS INDUSTRY	38-48
<b>Chapter 5</b> MODELING OF UNCONVENTIONAL SHALE GAS RESERVOIRS FOR A DECARBONIZED ECONOMY	49-61
Chapter 6 SOLAR ENERGY ADVANCEMENTS AND THEIR ENVIRONMENTAL IMPACTS	62-76
PART 2	
Chapter 1 TRANSPORT AND INTERACTIONS IN MEMBRANE	77-93
Chapter 2 GRID INTEGRATION PROBLEMS AND THEIR SOLUTION	94-98
<b>Chapter 3</b> BIOCHAR I: A RENEWABLE AND SUSTAINABLE SOURCE FOR ENERGY	99-110
Chapter 4 BIOCHAR II: SYNTHESIS, CHARACTERIZATION AND APPLICATION	111-127
<b>Chapter 5</b> FUTURE TRENDS IN RENEWABLE ENERGY & GREEN TECHNOLOGY FOR SUSTAINABLE DEVELOPMENT	128-144

### PART 3

<b>Chapter 1</b> AN EXPERIMENTAL INVESTIGATION ON THE EFFECT OF WATER HARDNESS ON THE RHEOLOGICAL AND FILTRATION LOSS PROPERTIES OF AQUEOUS BASED DRILLING MUD	145-152
<b>Chapter 2</b> CHINA'S JOURNEY OF RENEWABLE ENERGY DEPLOYMNET: LEARNING FROM THE INITIATEVES UNDERTAKEN BY GLOBAL LEADER	153-162
<b>Chapter 3</b> MICROALGAE: A SUSTAINABLE AND RENEWABLE SOURCE FOR BIOENERGY PRODUCTION	163-172
PART 4	
<b>Chapter 1</b> FOOD WASTE AND MUNICIPAL SOLID WASTE AS A SOURCE OF RENEWABLE ENERGY	173-182
Chapter 2 DIFFERENT PERSPECTIVES OF GREEN TECHNOLOGY	183-196
<b>Chapter 3</b> BIOMASS ENERGY: THE MAGNITUDE OF THE POSSIBLE RESOURCE	197-214
PART 5	
Chapter 1 THERMAL COMFORT OF VERNACULAR BUILDINGS ACCORDING TO SOCIAL STATUS AT KALABURAGI	215-228
<b>Chapter 2</b> PERFORMANCE ENHANCEMENT OF SOLAR STILL THROUGH MODIFICATIONS BY VARIOUS TECHNIQUES: A REVIEW	229-254
PART 6	
Chapter 1	

A DESCRIPTIVE STUDY OF SUSTAINABLE DEVELOPMENT GOALS	
AND THEIR COMPREHENSION IN THE INDIAN CONTEXT	255-265

# PART 1

# **Futuristic Trends in Renewable &**

# **Sustainable Energy**

# Series Id: IIP\_V2\_2022\_BS\_18\_02

# **Series Editors**

### Dr. Deepjyoti Mech

Assistant Professor Department of Petroleum Engineering Presidency University Bengaluru, Karnataka, India

### Dr. Bibhabasu Mohanty

Assistant Professor Environmental Science Department SAL Institute of Technology and Engineering Research Ahmedabad, Gujarat, India

### Dr. S. D. Sundarsingh Jebaseelan

Associate Professor Electrical & Electronics Engineering Department Sathyabama University Chennai, Tamilnadu, India

### Sunam Saha

Assistant Professor Electrical and Electronics Engineering Adamas University Jabalpur, Madhya Pradesh