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Biogas Technology
BIOTECHNOLOGY - Volume X
Emerging Energy Alternatives for Sustainable Environment

VANESSA HUDSON

Alternative Transportation Fuels CRC Press

Due to the rapid increase in the production and consumption processes, societies generate as well as reject solid materials regularly from various sectors. The primary goals of this book are to encourage reduction of waste at the source and to foster implementation of cost-effective integrated solid waste management systems.

Sustainable Biofuels Development in India Academic Press

This Book Is Written With Special Focus On Issues Relating To Policies And Strategies For Planning And Implementation Of Biogas Programme. The Book Provides A Detailed Overview Of Biogas Technology Covering All The Facets. It Provides Comprehensive History And Progress Of Biomethanation In Select Countries And Regions Where It Has Made Special Mark. It Provides A Detailed Overview Of Developments In India Covering Historical Perspectives, Biogas Potential, Chronological Progress Of Biomethanation, And Enumerates References Made To Biogas At Important Seminars And Conferences By Eminent Personalities From India And Abroad. It Comprehensively Spells Out Various Implementation Strategies Particularly The Turnkey Approach Which Is Largely Responsible For Bringing Biogas Revolution In India Judging By The Unprecedented Spurt In The Number Of Biogas Plants Installed In Recent Years. It Consolidates The Findings And Recommendations Of Several Socio-Economic Surveys On Biomethanation Undertaken In Past In India From Time To Time. It Presents Case-Studies Of Several Community Biogas Plants Which Have Greatly Helped In Improving The Rural Economy. It Also Provides An Overview Of Energy Needs Of Developing Countries, Reviews Integrated Rural Energy Programme (Irep) And The Urjagram Programmes Of The Union Government As Supportive Programmes For Biomethanation, And Views Biogas Programme As An Instrument Of Sustainable Development. It Discusses At Length The Economics And Cost- Effectiveness Of Biogas Systems. The Book Also Identifies Areas For Further Studies And Looks Forward That Biomethanation Will Scale New Heights Even When The Subsidies Are Completely Withdrawn And Market-Driven Approach Under The New Economic Policy Governs The Biogas Programme. In Short, The Book Covers All Related Aspects Involving Policies, Progress And Prospects Of Biomethanation In India And Abroad.

Biomethane through Resource Circularity CRC Press

There is perfect relationship between energy, ecology and environment. If a proper balance is maintained among these three aspects than sustainable development for the welfare of human beings is obtained. This book has been written with a view to draw attention for integration of renewable energy in all sectors for sustainable development. The aim of this book is to examine the range of views related to renewable energy sources for sustainable and their implications. The authors have simplified and clarified renewable energy technologies and new theories for a sustainable development. Sustainable development has been characterized by an emphasis on environmental issues and its inter-relationship with renewable energy sources. In present context

there is a need to develop an approach to structure the subject which hinders the development of knowledge in a systematic way. The built environment contributes significantly to the society and thus development in holistic manner. Integration of renewable energy sources is one of the major factors in determining whether a community is sustainable in the longer term or not. In this book, emphasis has been made on various aspects of energy planning such as energy assessment, energy integration, energy forecasting, energy modeling, computer modeling and techno-economic analysis of different conventional as well as non-conventional renewable energy sources. Much of the information presented in this book is basically to acquire an understanding of the integrated energy planning, its design, development, implementation, monitoring and feedback evaluation. This book will be useful for those involved in energy activities and planning.

Proceedings of the 1986 International Congress on Renewable Energy Sources Vikas Publishing House

This book is an ideal reference text for teaching renewable energy to engineering and science students, as well as a reference book for scientists and professionals doing self study on the subject. The book has twelve chapters and starts with the definition and classification of renewable and non renewable energy and their status at global level. This chapter also contains the basic heat transfer mechanisms and laws of thermodynamics. It then deals with availability of solar radiation at different latitudes and energy and exergy analysis of flat plate collector, solar air collector, solar concentrator, evacuated tube collector, solar water heating system, solar distillation and solar cooker. The following chapter discusses the basics of semiconductor, its characteristics, working, characteristics of solar cell in dark and daylight situation, fundamentals of characteristic curves of semiconductor, fundamentals of PV module and array and some PVT systems. Detailed discussion on biomass, bio-fuels and biogas and their applications and the power produced by them, namely bio-power, is covered in the following chapters. Other renewable energy sources like hydropower, wind and geothermal are then covered as well as a chapter dealing with the working principle, basic theory and the capability to produce power from ocean thermal, tidal, wave and animal energy conversion systems. Subsequently, net CO₂ mitigation, carbon credit, climate change and environmental impacts of all renewable energy resources are all covered followed by a discussion on the techno-economic feasibility of any energy sources as the backbone of its success and hence energy and economic analysis. The chapters deal the overall exergy of renewable energy sources by using the thermal and mechanical power and electrical energy as output. SI units are used throughout the book in solving various exercises in each chapter and conversion units of various physical and chemical parameters of metals and non-metals are also given in appendices.

Fundamentals of Biofuel Production Processes Concept Publishing Company

This book is a collection and compilation of various principles of renewable energy technologies and explores how we can use the sun, wind, biomass, geothermal, tidal and water resources to generate energy in a more sustainable form. Each chapter begins with the fundamental theory behind each technology illustrated with clear figures to understand the principle and applications. It also explains the fundamentals of energy, including the transfer of energy, as well as the limitations of natural

resources. Starting with solar and wind energy, the text illustrates how energy from the sun, wind and water is transferred and converted into electricity. Other chapters cover methods of energy conversion, biomass energy, biofuel production and other new and renewable sources of energy such as geothermal, hydro, tidal, and ocean energy. This book is a collection of various principles of renewable energy technologies and explores how we can use the sun, wind, biomass, geothermal, tidal and water resources to generate energy in a more sustainable form.

Taylor & Francis

Advanced Biofuel Technologies: Present Status, Challenges and Future Prospects deals with important issues such as feed stock availability, technology options, greenhouse gas reduction as seen by life cycle assessment studies, regulations and policies. This book provides readers complete information on the current state of developments in both thermochemical and biochemical processes for advanced biofuels production for the purpose of transportation, domestic and industrial applications. Chapters explore technological innovations in advanced biofuels produced from agricultural residues, algae, lipids and waste industrial gases to produce road transport fuels, biojet fuel and biogas. Covers technologies and processes of different types of biofuel production. Outlines a selection of different types of renewable feedstocks for biofuel production. Summarizes adequate and balanced coverage of thermochemical and biochemical methods of biomass conversion into biofuel. Includes regulations, policies and lifecycle and techno-economic assessments. Management of Municipal Solid Waste Royal Society of Chemistry

The global demand for energy is met mainly by fossil fuels. Their excessive and indiscriminate use, coupled with increasing demand for energy, will soon deplete their existing reserves. Therefore, it is extremely important to find alternative, environment-friendly, and ecologically sound sources of energy for meeting the present and future energy requirements. *Biogas Technology: Towards Sustainable Development* makes an attempt to explore the potential of utilizing biodegradable biomass as fuel and manure.

Bioenergy Engineering Springer Nature

The future of China, India and Asia's other emerging economies and their ability to take a 'low-carbon' and 'climate-resilient' development path determine the future of global carbon emissions and climate change. Indeed, the battle to confront global climate change will be won or lost in Asia. The transition to a low-carbon, climate-resilient economy (LCE), which involves many steps towards improved energy efficiency, alternative energy sources and transport systems, sustainable land use, eco-friendly consumption and proactive adaptation, may be regarded as the world's fourth revolution, after the industrial revolution, agricultural revolution, and the information revolution. Asia is highly vulnerable to impacts of climate change. Yet because of its dynamic economies and massive populations, Asia offers the greatest opportunity for overcoming the trade-offs and pursuing low-carbon development pathways. With a growing consensus that there is limited time to avoid the worst impacts of climate change, scientists, engineers, policymakers, and economists across Asia have recently begun discussions on how Asia can make a transition to LCE. Most discussions, however, focused on transfer of technologies from developed to developing countries and overlooked other equally important challenges such as financing, governance, and information dissemination. This book is the first to look at these neglected aspects of LCE and attempt to

integrate both market-based and technology-based solutions into a comprehensive strategy to creating a roadmap for LCE in Asia. This book is an essential reading for economists, policy makers, practitioners, engineers and researchers concerned with climate change, energy production and development in Asia and the impacts and potential for the world.

Biogas Systems PHI Learning Pvt. Ltd.

Sustainability of environment is an emerging global issue at present. Unsustainable or deteriorating environment is a matter of concern as it has threatened the survival of living creatures. Recently, climate change has been a matter of great concern at a global platform owing to imbalances in natural environment. Increasing population has increased the demand for energy, which has ultimately put pressure on natural resources and caused a paradigm shift from resource generation to exploitation. *Emerging Energy Alternatives for Sustainable Environment* aims to address the role of sustainable technologies in energy generation options for clean environment. It covers a wide spectrum of energy generation approaches, with an emphasis on five key topics: (i) renewable energy sources and recent advances, (ii) emerging green technologies for sustainable development, (iii) assessment of biomass for sustainable bioenergy production, (iv) solid waste management and its potential for energy generation, and (v) solar energy applications, storage system, and heat transfer. This book provides essential and comprehensive knowledge of green energy technologies with different aspects for engineers, technocrats and researchers working in the industry, universities, and research institutions. The book is also very useful for undergraduate and graduate students of science and engineering who are keen to know about the development of renewable energy products and their corresponding processes. Please note: This volume is Co-published with The Energy and Resources Institute Press, New Delhi. Taylor & Francis does not sell or distribute the Hardback in India, Pakistan, Nepal, Bhutan, Bangladesh and Sri Lanka

Innovation in the Indian Power Sector, Technologies and Approaches Springer

Focusing on fundamentals of biofuel production from renewable energy sources and biohydrogen production, this book offers a complete understanding of the bioconversion processes. Each chapter begins with a fundamental explanation for general readers and ends with in-depth scientific details suitable for expert readers. It discusses different types of production technologies covering basic concepts, production strategies, commercial usage, and advances.

Biogas Technology New India Publishing

A continuous rise in the consumption of gasoline, diesel, and other petroleum-based fuels will eventually deplete reserves and deteriorate the environment, *Alternative Transportation Fuels: Utilisation in Combustion Engines* explores the feasibility of using alternative fuels that could pave the way for the sustained operation of the transport sector

Advanced Renewable Energy Sources Biogas Systems

The International Conference on the State of the Art on Biogas Technology, Transfer and Diffusion was held in Cairo, Egypt, from 17 to 24 November 1984. The Conference was organized by the Egyptian Academy of Scientific Research and Technology (ASR T), the Egyptian National Research Centre (NRC), the Bioenergy Systems and Technology project (BST) of the US Agency for International Development (US/AID) Office of Energy, and the National Academy of Sciences (NAS). A number of international organizations and agencies co-sponsored the Conference. More than 100

participants from 40 countries attended. The purpose of the Conference was to assess the viability of biogas technology (BGT) and propose future courses of action for exploiting BGT prospects to the fullest extent. The Conference emphasized a balanced coverage of technical, environmental, social, economic and organizational aspects relevant to biogas systems design, operation and diffusion. It was organized to incorporate experiences that are pertinent, for the most part, to developing countries. In addition to the wide spectrum of presentations and country programs, structured and non-structured discussions among the participants were strongly encouraged in thematic sessions at round-table discussions, and through personal contacts during poster sessions and field trips. It was clear from the enthusiastic response of most participants that the Conference, in large measure, succeeded in fulfilling its mission. Although draft papers were distributed to all participants, it was felt that the results obtained were worthy of organized and refined documentation. And this is precisely what this book intends to do.

Power Plant Engineering CRC Press

This book shares the latest developments and advances in materials and processes involved in the energy generation, transmission, distribution and storage. Chapters are written by researchers in the energy and materials field. Topics include, but are not limited to, energy from biomass, bio-gas and bio-fuels; solar, wind, geothermal, hydro power, wave energy; energy-transmission, distribution and storage; energy-efficient lighting buildings; energy sustainability; hydrogen and fuel cells; energy policy for new and renewable energy technologies and education for sustainable energy development.

Numericals and Short Questions in Farm Machinery, Power and Energy in Agriculture Taylor & Francis

Green technologies are the technologies which are environment friendly; developed and used in such a way so that it doesn't disturb our environment and conserves natural resources. Some people may refer Green Technology as Environmental Technology or Clean Technology. Green inventions are environmentally friendly inventions that often involve: energy efficiency, recycling, safety and health concerns, renewable resources, and more. Green technology is based on the four pillars on various sectors, which are:

Practical Manual On Green Energy Technologies Springer Science & Business Media

In recent years, the importance of biogas energy has risen manifold and has become universal. This is due to the realization that biogas capture and utilization has great potential in controlling global warming. By capturing biogas wherever it is formed, we not only tap a source of clean energy, but we also prevent the escape of methane to the atmosphere. Given that methane has 25 times greater global warming potential than CO₂, methane capture through biogas energy in this manner can contribute substantially towards global warming control.

Solar Energy Update CRC Press

This book focuses on biogas production by anaerobic digestion, which is the most popular bioenergy technology of today. Using anaerobic digestion for the production of biogas is a sustainable approach that simultaneously also allows the treatment of organic waste. The energy contained in the substrate is released in the form of biogas, which can be employed as a renewable fuel in diverse industrial sectors. Although biogas generation is considered an established process, it

continues to evolve, e.g. by incorporating modifications and improvements to increase its efficiency and its downstream applications. The chapters of this book review the progress made related to feedstock, system configuration and operational conditions. It also addresses microbial pathways utilized, as well as storage, transportation and usage of biogas. This book is an up-to-date resource for scientists and students working on improving biogas production.

Handbook on Renewable Energy and Green Technology CRC Press

The Distinguishing Feature Of The Book Is Its Exhaustive Coverage Encompassing Theory And Practical Aspects On Items Like The Status Of Biogas Technology, Different Types Of Biogas Plants And Their Suitability For A Given Situation, Their Design Aspects, Sizing And Scaling Of Biogas Plants Which Are Illustrated With Calculations And Working Drawings. In Addition, Constructional Aspects, Cost Aspects, Diagnosis And Cure Of Faults During Operation And Details Of Utilisation Devices Are Detailed.

Renewable Energy Sources The Energy and Resources Institute (TERI)

Design and Optimization of Biogas Energy Systems presents an overview on planning, implementing, assessing and optimizing biogas systems, from fuel conversion to power generation. The book introduces the fundamental elements of bioenergy systems, highlighting the specificities of biogas systems. It discusses the current state of their adoption at a global level and the challenges faced by designers and operators. Methods for sizing, simulating and modeling are discussed, including prefeasibility analysis, available production processes, integration into hybrid energy systems, and the application of Big Data analysis and game theory concepts. All chapters include real-life examples and exercises to illustrate the topics being covered. The book goes beyond theory to offer practical knowledge of methods to reach solutions to key challenges in the field. This is a valuable resource for researchers, practitioners and graduate students interested in developing smart, reliable and sustainable biogas technologies. Provides an applied approach to biogas systems, from technology fundamentals, to economic and environmental assessment. Explores control methods and reliability prediction of each system component, including modeling and simulation with HOMER and MATLAB. Discusses the use of Big Data analysis, numerical methods, and Game Theory for plant assessment.

Aid, Technology and Development CRC Press

This book presents selected proceedings of the International Conference on Advances in Mechanical Processing and Design (ICAMPD 2019). The contents highlight latest research in next-generation mechanical systems design, thermal and fluid systems design, materials and smart manufacturing processes, and industrial engineering. Some of the topics covered include smart materials, materials processing and applications, smart machinery and machine design, system dynamics and simulation, biomimetics, energy systems, micro- and nano-scale transport, automotive engineering, advance material characterization and testing, and green and sustainable manufacturing. Given the scope of the contents, this book can be of interest to students, researchers as well as industry professionals.

Renewable Energy in the Global Context CRC Press

This book will provide assistance to the broad range of readers involved in the crude oil import and production; renewable energy production; biomass analysis and bioconversion; greenhouse gas

emissions; techno-economic analysis and government policies for implementing biofuels in India. This book presents important aspects on the large scale production of biofuels following a bio-refinery concept and its commercialization and sustainability issues. Hence, it is a useful resource to policy makers, policy analysts, techno-economic analysts and business managers who deal with commercialization and implementation of bio-based energy and other value-added products. The following features of this book attribute its distinctiveness: As a first uniquely focused scientific and

technical literature on bioenergy production in the context of India. To its coverage of technological updates on biomass collection, storage and use, biomass processing, microbial fermentation, catalysis, regeneration, solar energy and monitoring of renewable energy and recovery process. To the technical, policy analysis, climate change, geo-political analysis of bioenergy and green transportation fuels at industrial scale.

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