

Sustainability Of Global Biogas Developments | 111855b939d059b1a1cb5115e7231a14

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Perspectives for Biogas in Europe

Clean Energy for Sustainable Development: Comparisons and Contrasts of New Approaches presents information on the fundamental challenge that the energy sector faces with regard to meeting the ever growing demand for sustainable, efficient, and cleaner energy. The book compares recent developments in the field of energy technology, clean and low emission energy, and energy efficiency and environmental sustainability for industry and academia. Rasul, Azad and Sharma, along with their team of expert contributors, provide high-end research findings on relevant industry themes, including clean and sustainable energy sources and technologies, renewable energy technologies and their applications, biomass and biofuels for sustainable environment, energy system and efficiency improvement, solar thermal applications, and the environmental impacts of sustainable energy systems. This book uses global institutes and case studies to explore and analyze technological advancements alongside practical applications. This approach helps readers to develop and affirm a better understanding of the relevant concepts and solutions necessary to achieve clean energy and sustainable development in both medium and large-scale industries. Compares in-depth research on a wide range of clean technologies, from global institutes in Australia, Europe, and India Evaluates the recent developments in clean technologies against the efficiency of tried and tested applications Considers case studies on the advancements of sustainable energy into industry from around the world

Governance of Environmental Sustainability of Manure-Based Centralised Biogas Production in Denmark

This book provides an overview of current and future bioenergy developments, describes the impacts related to poverty and the environment, assesses the opportunities and

challenges and outlines how future World Bank activities related to bioenergy may be linked to poverty alleviation and environmental protection.

Sustainable Development and Environmental Management

A side-effect of numerous anthropogenic activities involves unfavourable changes in the natural environment. The acquisition of natural resources, especially fossil fuels, solid waste and wastewater production, as well as emission of gases and particulate matter from industrial plants and means of transport contribute to disturbances in the natural cycles of elements between different parts of the environment. Local changes lead to global effects, changing the composition of atmosphere, its capacity for absorbing the infrared radiation and temperature, which has further repercussions in the form of weather anomalies, melting glaciers, flooding, migration or extinction of species, social problems, etc. These global changes can be mitigated by local remedial actions, simultaneously taken all over the world, including Poland. Only the joint efforts of communities from different countries can be successful in preserving the world as we know it for the future generations. Realisation of this task requires the cooperation of experts across many fields of science, environmental engineering being one of most relevant. It comprises the engineering actions taken to preserve the balance of the natural environment or restore it if degradation has occurred. This monograph presents several key issues related to the actions aimed at mitigating the negative impact on the environment connected with the acquisition and transport of energy, management of municipal and industrial wastes, as well as the impact of the industry on the aquatic and soil environment. This book is dedicated to academics, engineers, and students involved in environmental engineering, who are following the advances in the research on environmental aspects of energy production and waste management.

Biomass, Biofuels, Biochemicals

The utilization of various types of biomass residue to produce products such as biofuels and biochemicals means biorefinery technology using biomass residues may become a one-stop solution to the increasing need for sustainable, non-fossil sources of energy and chemicals. Refining Biomass Residues for Sustainable Energy and Bioproducts: Technology, Advances, Life Cycle Assessment and Economics focuses on the various biorefineries currently available and discusses their uses, challenges, and future developments. This book introduces the concept of integrated biorefinery systems, as well as their operation and feedstock sourcing. It explores the specificities, current developments, and potential end products of various types of residue, from industrial and municipal to agricultural and marine, as well as residue from food industries. Sustainability issues are discussed at length, including life cycle assessment, economics, and cost analysis of different biorefinery models. In addition, a number of global case studies examine successful experiences in different regions. This book is an ideal resource for researchers and practitioners in the field of bioenergy and waste management who are looking to learn about technologies involved in residue biorefinery systems, how to reduce their environmental impacts, and how to ensure their commercial viability. Explores a range of different biorefinery categories, such as industrial, agricultural, and marine biomass residues Includes a Life Cycle Assessment of biorefinery models, in addition to costs and market analysis. Features case studies from around the world and is written by an international team of authors

Sustainability at the Cutting Edge

Advances in Eco-fuels for Sustainable Environment presents the most recent developments in the field of environmentally friendly eco-fuels. Dr. Kalad Azad and his

team of contributors analyze the latest bio-energy technologies and emission control strategies, while also considering other important factors, such as environmental sustainability and energy efficiency improvement. Coverage includes biofuel extraction and conversion technologies, the implementation of biotechnologies and system improvement methods in the process industries. This book will help readers develop a deeper understanding of the relevant concepts and solutions to global sustainability issues with the goal of achieving cleaner, more efficient energy. Energy industry practitioners, energy policymakers and government organizations, renewables researchers and academics will find this book extremely useful. Focuses on recent developments in the field of eco-fuels, applying concepts to various medium-large scale industries Considers the societal and environmental benefits, along with an analysis of technologies and research Includes contributions from industry experts and global case studies to demonstrate the application of the research and technologies discussed

Energy, Policy, and the Environment

Presents the research findings in modern technological developments based on synthetic chemicals that are highly toxic to the human environment. This book includes various types of appropriate energy technologies suitable for cooking, heating, lighting, transportation, and industrial usage.

Biogas Processes for Sustainable Development

This book summarizes the latest research on advanced intelligent systems in the fields of energy and electrical engineering, presented at the second edition of the International Conference on Advanced Intelligent Systems for Sustainable Development (AI2SD'2019), held in Marrakech from 8 to 11 July 2019, Morocco. This book is intended for researchers, professionals and anyone interested in the development of advanced intelligent systems in the electrical engineering sector. The solutions featured focus on three main areas: motion control in complex electromechanical systems, including sensorless control; fault diagnosis and fault-tolerant control of electric drives; and new control algorithms for power electronics converters. In addition, the book includes a range of research using new technologies and advanced approaches. Offering a platform for researchers in the field of energy to share their work related to the problem of management and optimization of energy, which is a major current concern, the book mainly focuses on areas that go hand in hand with the Industrial Revolution 4.0, such as solar energy computing systems, smart grids, hydroelectric power computing systems, thermal and recycling computing systems, eco-design intelligent computing systems, renewable energy for IT equipment, modeling green technology, and renewable energy systems in smart cities. The authors of each chapter report the state of the art in the topics addressed and the results of their own research, laboratory experiments, and successful applications in order to share the concept of advanced intelligent systems and appropriate tools and techniques for modeling, storage management, as well as decision support in the field of electrical engineering. Further, the book discusses a number of future trends and the potential for linking control theory, power electronics, artificial neural networks, embedded controllers and signal processing.

Advances in Eco-Fuels for a Sustainable Environment

We are more aware of the need to achieve sustainable development than ever before. It is fair to say that two of the most important factors affecting sustainability are the ways of both producing and using energy. In this sense, this book provides a forum to articulate and discuss energy management issues in the frame of achieving sustainable development. And undoubtedly, we are also deeply concerned about these issues in the

recent times. This volume contains 6 chapters and is organized into three sections: "Policies and Strategies", and "Technologies and Industries".

[The Power of Renewables](#)

This book is the outcome of contributions by many experts in the field from different disciplines, various backgrounds, and diverse expertise. This book provides information on biomass volume calculation methods and biomass valorization for energy production. The chapters presented in this book include original research and review articles. I hope the research presented in this book will help to advance the use of biomass for bioenergy production and valorization. The key features of the book are: Providing information on biomass volume estimation using direct, nondestructive and remote sensing methods Biomass valorization for energy using thermochemical (gasification and pyrolysis) and biochemical (fermentation) conversion processes.

[Green Energy to Sustainability: Strategies for Global Industries](#)

There are numerous problems in the world that need to be dealt with in order to achieve sustainable development. The energy system has significant negative impacts on many of these problems, and there is a need for a transition towards more sustainable energy. Sweden has already started this transition and is using large amounts of renewable energy. However, within the transport sector and the manufacturing sector in particular, large amounts of fossil fuels are still used. Biogas is one alternative that can help solve several sustainability problems and that could be part of a future more sustainable energy system. However, it is not certain what biogas is most suitable to be used for. The aim of this thesis is to investigate how biogas should be used in a future more sustainable energy system, by answering three research questions: 1) In what ways can biogas be used in a more sustainable energy system? 2) How can we assess whether biogas is suitable in a specific context? and 3) What determines whether it is easy or difficult for a user to start using biogas? These questions are explored in a Swedish context using four appended articles, which are based on two collaborative projects using a combination of workshops, literature reviews and interviews. Biogas can be used for heat, electricity or fuel in the manufacturing or transport sector. In Sweden, heat and electricity are mainly of interest for smaller production scales, while production on larger scales will likely be dominated by upgrading mostly to CBG but also to LBG. CBG can be used for less energy-intensive purposes, such as cars or buses, while the growing interest in LBG in Sweden may open up new market segments for biogas which are more energy-intensive, such as heavy trucks or shipping, or in geographical locations that are further away from the site of production. Several sustainability assessment methods exist that can be used to evaluate whether biogas is suitable in a specific context, such as multi-criteria assessments or scenario analyses. These methods can include a number of different aspects that are relevant to biogas use, such as GHG emissions, safety issues, and the vitality of the surrounding region. In order to introduce biogas, six main factors were identified that can make this easier or more difficult: technical maturity, tank volume, distance between the producer and the user, scale of energy use, policies and costs, and strategies of individual organizations. Overall, the rise in LBG production creates new opportunities for biogas use in both geographical and usage areas that did not previously use biogas. There is no simple answer to what biogas should be used for in the future - rather, this depends on the circumstances. It is also possible that the usage areas that are most suitable now for biogas might not be the most suitable areas in the future, depending on developments within, for example, the electricity system and hydrogen. However, CBG and LBG are likely to dominate biogas production in Sweden until then.

[Energy Sustainability Through Green Energy](#)

In this second edition of The Sociology of Food and Agriculture, students are provided with a substantially revised and updated introductory text to this emergent field. The book begins with the recent development of agriculture under capitalism and neo-liberal regimes, and the transformation of farming and peasant agriculture from a small-scale, family-run way of life to a globalized system. Topics such as the global hunger and obesity challenges, GM foods, and international trade and subsidies are assessed as part of the world food economy. The final section concentrates on themes of sustainability, food security, and food sovereignty. The book concludes on a positive note, examining alternative agri-food movements aimed at changing foodscapes at levels from the local to the global. With increased coverage of the financialization of food, food and culture, gender, ethnicity and justice, food security, and food sovereignty, the book is perfect for students with little or no background in sociology and is also suitable for more advanced courses as a comprehensive primer. All chapters include learning objectives, suggested discussion questions, and recommendations for further reading to aid student learning.

[Sustainable Energy Solutions in Agriculture](#)

[The Sociology of Food and Agriculture](#)

Current Developments in Biotechnology and Bioengineering: Sustainable Bioresources for the Emerging Bioeconomy outlines recent advances in bioenergy, biorefinery and the bioeconomy, an essential element for a 21st century bio-based society. The book provides information on biomass and various conversion technologies with different parameters that affect the conversion process. Sections cover different bioproducts, biorefinery systems, energy and greenhouse gas emission balances of bioenergy and biorefinery, and environmental and economic footprints of bioeconomy. Finally, different strategies adopted by developed and developing countries for the promotion and implementation of a bioeconomy concept for a bio-based society are systematically covered. The book provides comprehensive information starting from early progress to the latest trends on bioenergy, biorefinery and bioeconomy with special reference to the developed and the developing countries and the linkage between bioeconomy and climate change mitigation in simple scientific language to appeal to a wider audience. Includes the fundamentals and concepts of biomass and bioenergy Outlines recent technology development for biomass conversion Provides concept for different bioproducts Covers global strategies and policies on the development of bioeconomies

[Advanced Intelligent Systems for Sustainable Development \(AI2SD'2019\)](#)

Sustainable Bioenergy: Advances and Impacts presents a careful overview of advances and promising innovation in the development of various bioenergy technologies. It covers the production of bio-jet fuel, algal biofuels, recent developments in bioprocesses, nanotechnology applications for energy conversion, the role of different catalysts in the production of biofuels, and the impacts of those fuels on society. The book brings together global experts to form a big picture of cutting-edge research in sustainable bioenergy and biofuels. It is an ideal resource for researchers, students, energy analysts and policymakers who will benefit from the book's overview of impacts and innovative needs. Explores the most recent advances in biofuels and related energy systems, including innovations in catalysts and biocatalysts Provides an overview of the impacts of bioenergy and its sustainability aspects Discusses real-life cases of implementation of bioenergy systems on an industrial scale

[Refining Biomass Residues for Sustainable Energy and Bioproducts](#)

The SAGE Handbook of Nature offers an ambitious retrospective and prospective overview of the field that aims to position Nature, the environment and natural processes, at the heart of interdisciplinary social sciences. The three volumes are divided into the following parts: INTRODUCTION TO THE HANDBOOK NATURAL AND SOCIO-NATURAL VULNERABILITIES: INTERWEAVING THE NATURAL & SOCIAL SCIENCES SPACING NATURES: SUSTAINABLE PLACE MAKING AND ADAPTATION COUPLED AND (DE-COUPLED) SOCIO-ECOLOGICAL SYSTEMS RISK AND THE ENVIRONMENT: SOCIAL THEORIES, PUBLIC UNDERSTANDINGS, & THE SCIENCE-POLICY INTERFACE HUNGRY AND THIRSTY CITIES AND THEIR REGIONS CRITICAL CONSUMERISM AND ITS MANUFACTURED NATURES GENDERED NATURES AND ECO-FEMINISM REPRODUCTIVE NATURES: PLANTS, ANIMALS AND PEOPLE NATURE, CLASS AND SOCIAL INEQUALITY BIO-SENSITIVITY & THE ECOLOGIES OF HEALTH THE RESOURCE NEXUS AND ITS RELEVANCE SUSTAINABLE URBAN COMMUNITIES RURAL NATURES AND THEIR CO-PRODUCTION This handbook is a key critical research resource for researchers and practitioners across the social sciences and their contributions to related disciplines associated with the fast developing interdisciplinary field of sustainability science.

Biomass Utilization

Maize is a staple cereal after wheat and rice. It is an important source of carbohydrate, protein, iron, vitamin B and minerals for many poor people in the world. In developing countries maize is a major source of income in resource-poor farmers. As maize is used both as silage and as crop residue and the grains of maize are usually used for food, starch and oil extraction industrially, the demand for maize is rising day by day. Therefore, it is imperative for improvement of maize to meet the increasing demand. This book entitled "Maize - Production and Use" highlights the importance of maize and the improved management approaches for improving the productivity of maize in the era of changing climate.

Clean Energy for Sustainable Development

This book sets the questions of energy and the environment in the North in the global context and further addresses historical developments, views on energy taxation and tariffs, and effects of EU energy policy. Climate change appears more frequently than ever on the top of global and national policy agendas. In the current situation traditional environmental concern and environmental policy may not suffice in the face of the global challenge as manifested by climate change and the depletion of fossil energy resources. But as new data comes to light, new energy policies and changes in economic structures are crucial for putting into action global climate policy. Crucial tasks in environmental policy are the sustainable utilisation of natural resources and the conservation of natural and human-made habitats. One of the areas of the world where this comes into play the most is in the Nordic countries. Northern societies are predominantly high tech, high consumption and high energy supply societies. And with the transition from older energy sources (wood for heating and stream water for power production) to newer ones (oil and nuclear energy) discussions on the environmental impact have led to public and corporate action. The Northern countries have been at the forefront in finding sustainable alternatives to solve conflicts arising from the rise in energy needs. However, these countries have taken different pathways with different policies in attempting to achieve this. As the needs and concerns from climate change arise, a Northern dimension, involving policies that contrast to European and global trends, emerges. Energy, Policy, and the Environment: Modeling Sustainable Development for the North explores that dimension.

Energy Roadmap 2050

I kölvattnet av klimatkrisen har det blivit allt tydligare att det fossilbaserade transportsystemet måste genomgå en global omvandling. Många alternativ för förnyelsebara drivmedel har föreslagits, alla omgivna av föreställningar om hur dessa tekniker kommer att bidra till en bättre framtid. Dessa föreställningar påverkar utvecklingen eftersom implementeringen av varje alternativ teknik kräver uppbyggnad av mångfaldiga socio-tekniska ensembler som stöder dess användning. Som ett resultat av detta är det troligt att processen för att ersätta fossila bränslen med dessa förnybara alternativ kommer bli komplex. Avhandlingen betraktar uppkomsten av två av dessa föreställningar om förnybara bränslen och studerar visioner om biogas och el i ett svenskt sammanhang. Biogas har en lång historia som transportbränsle i Sverige där, även om den utgör en liten andel av den totala bränsleanvändningen, utgör den ändå grunden för många kommunala kollektivtrafiksystem. Elektriska fordon har blivit alltmer attraktiva när fler aktörer anammar en föreställning som ser en framtid där fordon är delade, autonoma och elektriska. Denna interaktion exemplifieras i kollektivtrafik i städer eftersom många kommuner börjar implementera elbussar i ett försök att öka energieffektiviteten och minska föroreningarna. Denna avhandling följer tre fallstudier där föreställningarna om biogas och elfordon samverkar: kollektivtrafik i städerna Linköping respektive Malmö samt en analys av det omfattande nationella policydokumentet Fossilfrihet på väg. Avhandlingen bidrar till en bredare förståelse för hur visioner kan påverka tröghet och förändring av transportalternativ inom den bredare omställningen till en fossilfri framtid. In the wake of the climate crisis, it has become increasingly evident that the fossil fuel-based transport system must undergo a global transformation. Numerous renewable fuel alternatives have been suggested, accompanied by imaginaries of how these technologies will contribute to a better future. These imaginaries have a wide-ranging impact because the implementation of each alternative technology will require the build-up of multifarious socio-technical ensembles that support their use. As a result, replacing fossil fuels with these renewable alternatives is likely to be a complex process. This dissertation considers the emergence of two such visions of renewable fuels studying imaginaries of biogas and electricity in the Swedish context. Biogas has a long history of use as a transport fuel in Sweden, where although it makes up a small percentage of total fuel use it also forms the basis of numerous municipal public transport systems. Meanwhile, electric vehicles have become increasingly attractive as more actors subscribe to an imaginary that sees the future of vehicles as shared, autonomous, and electric. This interaction is exemplified in urban public transportation as many municipalities begin to implement electric buses in an attempt to increase energy efficiency and reduce pollution. This thesis follows three case studies where the imaginaries of biogas and electric vehicles interact: urban public transport in the municipalities of Linköping and Malmö, and analysis of a comprehensive national policy document Fossil fuel freedom on the road. It contributes to a wider understanding of how visions can influence obduracy and change of transport alternatives within the wider transformation to a fossil fuel free future.

[World Economic Situation and Prospects 2020](#)

[Maize](#)

Reviews the latest advances in biofuel manufacturing technologies and discusses the deployment of other renewable energy for transportation. Aimed at providing an interface useful to business and scientific managers, this book focuses on the key challenges that still impede the realization of the billion-ton renewable fuels vision. It places great emphasis on a global view of the topic, reviewing deployment and green energy technology in different countries across Africa, Asia, South America, the EU, and the USA. It also integrates scientific, technological, and business development perspectives to

highlight the key developments that are necessary for the global replacement of fossil fuels with green energy solutions. Green Energy to Sustainability: Strategies for Global Industries examines the most recent developments in biofuel manufacturing technologies in light of business, financial, value chain, and supply chain concerns. It also covers the use of other renewable energy sources like solar energy for transportation and proposes a view of the challenges over the next two to five decades, and how these will deeply modify the industrial world in the third millennium. The coming of age of electric vehicles is also looked at, as is the impact of their deployment on the biomass to biofuels value chain. Offers extensive updates on the field of green energy for global industries Covers the structure of the energy business; chemicals and diesel from biomass; ethanol and butanol; hydrogen and methane; and more Provides an expanded focus on the next generation of energy technologies Reviews the latest advances in biofuel manufacturing technologies Integrates scientific, technological and business perspectives Highlights important developments needed for replacing fossil fuels with green energy Green Energy to Sustainability: Strategies for Global Industries will appeal to academic researchers working on the production of fuels from renewable feedstocks and those working in green and sustainable chemistry, and chemical/process engineering. It is also an excellent textbook for courses in bioprocessing technology, renewable resources, green energy, and sustainable chemistry.

[The role of biogas in a more sustainable energy system in Sweden](#)

Sustainability in agriculture and associated primary industries, which are both energy-intensive, is crucial for the development of any country. Increasing scarcity and resulting high fossil fuel prices combined with the need to significantly reduce greenhouse gas emissions, make the improvement of energy efficient farming and increased use of renewable energy essential. This book provides a technological and scientific endeavor to assist society and farming communities in different regions and scales to improve their productivity and sustainability. To fulfill future needs of a modern sustainable agriculture, this book addresses highly actual topics providing innovative, effective and more sustainable solutions for agriculture by using sustainable, environmentally friendly, renewable energy sources and modern energy efficient, cost-improved technologies. The book highlights new areas of research, and further R&D needs. It helps to improve food security for the rapidly growing world population and to reduce carbon dioxide emissions from fossil fuel use in agriculture, which presently contributes 22% of the global carbon dioxide emissions. This book provides a source of information, stimuli and incentives for what and how new and energy efficient technologies can be applied as effective tools and solutions in agricultural production to satisfy the continually increasing demand for food and fibre in an economically sustainable way, while contributing to global climate change mitigation. It will be useful and inspiring to decision makers working in different authorities, professionals, agricultural engineers, researchers, and students concerned with agriculture and related primary industries, sustainable energy development and climate change mitigation projects.

[Energy Management for Sustainable Development](#)

Inclusive Green Growth: The Pathway to Sustainable Development makes the case that greening growth is necessary, efficient, and affordable. Yet spurring growth without ensuring equity will thwart efforts to reduce poverty and improve access to health, education, and infrastructure services.

[Integrated Biogas Systems](#)

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.

Methane Emissions from Biogas Plants

The United States and China are the world's top two energy consumers and, as of 2010, the two largest economies. Consequently, they have a decisive role to play in the world's clean energy future. Both countries are also motivated by related goals, namely diversified energy portfolios, job creation, energy security, and pollution reduction, making renewable energy development an important strategy with wide-ranging implications. Given the size of their energy markets, any substantial progress the two countries make in advancing use of renewable energy will provide global benefits, in terms of enhanced technological understanding, reduced costs through expanded deployment, and reduced greenhouse gas (GHG) emissions relative to conventional generation from fossil fuels. Within this context, the U.S. National Academies, in collaboration with the Chinese Academy of Sciences (CAS) and Chinese Academy of Engineering (CAE), reviewed renewable energy development and deployment in the two countries, to highlight prospects for collaboration across the research to deployment chain and to suggest strategies which would promote more rapid and economical attainment of renewable energy goals. Main findings and concerning renewable resource assessments, technology development, environmental impacts, market infrastructure, among others, are presented. Specific recommendations have been limited to those judged to be most likely to accelerate the pace of deployment, increase cost-competitiveness, or shape the future market for renewable energy. The recommendations presented here are also pragmatic and achievable.

Sustainable Bioenergy

This book presents the new EU approach to environmental management and its attempt to place it in the perspective of sustainable development. Written by eminent scientists working on sustainable development, the book covers not only theoretical aspects but also gives practical cases and examples. China and other large and fast growing economies are putting increasing pressures on the global environment, but they are also looking at the European experience with great interest.

Sustainable Resource Recovery and Zero Waste Approaches

Current Developments in Biotechnology and Bioengineering: Sustainable Food Waste Management: Resource Recovery and Treatment covers the latest methods of food waste management and resource recovery from a sustainability perspective and is suitable for universities, municipalities, and companies working in the field. This book provides a comprehensive account of food waste chemistry, the latest techniques for food waste treatment and recycling, sustainability assessment (social, economic, environmental), and challenges in food waste management. The book explores recycling to value-added products using sustainable concepts and methodologies, and is useful as a course or reference book for biochemical engineering, environmental sustainability, and waste management. Covers recycling to value-added products using sustainable concepts and methodologies Provides an exhaustive description of general treatment options and their evaluation guidelines in terms of cost, energy consumption, and waste generation, enabling readers to understand the principles behind various recovery and treatment

schemes Describes existing and emerging food waste recycling technologies, products obtained, and process efficiencies Offers a thorough account of critical factors and challenges in food waste valorization, such as handling of new emerging contaminants, end-product purity, and life-cycle assessment

[Multiple Imaginaries of the Fossil Fuel Free Future](#)

Biomass, Biofuels, Biochemical: Circular Bioeconomy: Current Developments and Future Outlook presents the views of experienced academicians and researchers working in the area of the circular bioeconomy. This book presents an assortment of Resource recovery, Waste Biorefineries, Bio-electrochemical systems, Biopolymers and Green solvents, Bio-adsorbents, and Technology transfer topics. Environmental engineers, biotechnologists, science graduates, chemical engineers, industrial experts and policymakers working in these areas will find the information on the circular economy and its important part in developing low carbon and resource-productive economies very informative. Methodologies and beneficial strategic approaches to address the usage of wastes from agriculture, co-products, and by-products are also discussed. Provides information on recent developments in technology transfer and global scenarios of circular bioeconomy as a single point of reference for any query regarding circular economies Covers information on the recovery of resources, waste biorefineries and bio-electrochemical systems, and product development surrounding the circular bioeconomy Includes information on the integration of processes and technologies for the production of biofuels and value-added products Presents strategic integrations of various techniques/bioprocess that are essential in establishing a circular biorefinery

[The Biogas Handbook](#)

[Bioenergy Development](#)

This is the United Nations definitive report on the state of the world economy, providing global and regional economic outlook for 2020 and 2021. Produced by the Department of Economic and Social Affairs, the five United Nations regional commissions, the United Nations Conference on Trade and Development, with contributions from the UN World Tourism Organization and other intergovernmental agencies.

[Current Developments in Biotechnology and Bioengineering](#)

Emerging Technologies and Biological Systems for Biogas Upgrading systematically summarizes the fundamental principles and the state-of-the-art of biogas cleaning and upgrading technologies, with special emphasis on biological processes for carbon dioxide (CO₂), hydrogen sulfide (H₂S), siloxane, and hydrocarbon removal. After analyzing the global scenario of biogas production, upgrading and utilization, this book discusses the integration of methanation processes to power-to-gas systems for methane (CH₄) production and physiochemical upgrading technologies, such as chemical absorption, water scrubbing, pressure swing adsorption and the use of membranes. It then explores more recent and sustainable upgrading technologies, such as photosynthetic processes using algae, hydrogen-mediated microbial techniques, electrochemical, bioelectrochemical, and cryogenic approaches. H₂S removal with biofilters is also covered, as well as removal of siloxanes through polymerization, peroxidation, biological degradation and gas-liquid absorption. The authors also thoroughly consider issues of mass transfer limitation in biomethanation from waste gas, biogas upgrading and life cycle assessment of upgrading technologies, techno-economic aspects, challenges for upscaling, and future trends. Providing specific information on biogas upgrading

technology, and focusing on the most recent developments, Emerging Technologies and Biological Systems for Biogas Upgrading is a unique resource for researchers, engineers, and graduate students in the field of biogas production and utilization, including waste-to-energy and power-to-gas. It is also useful for entrepreneurs, consultants, and decision-makers in governmental agencies in the fields of sustainable energy, environmental protection, greenhouse gas emissions and climate change, and strategic planning. Explores all major technologies for biogas upgrading through physiochemical, biological, and electrochemical processes Discusses CO₂, H₂S, and siloxane removal techniques Provides a systematical approach to discuss technologies, including challenges to gas-liquid mass transfer, life cycle assessment, techno-economic implications, upscaling and systems integration

[Inherently-sustainable Technology Development](#)

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.

[Advances in Environmental Engineering Research in Poland](#)

Sustainability at the Cutting Edge is an essential guide to understanding the future direction of sustainable technology. This fully updated new edition deals not only with current best practice and state of the art case studies, but with the very latest emerging technologies which will transform the relationship between buildings and energy. Professor Smith describes how buildings can be made to significantly reduce their reliance on fossil-based energy by the use of solar and geothermal resources. He also describes a range of renewable energy generating technologies. As sustainable building becomes increasingly essential with the advance of climate change, government legislation and international treaties, this is valuable knowledge for every architect, engineer and designer. This immensely practical book is packed with useful diagrams, charts and colour photographs to illustrate a variety of the most recent case studies, including the education building, the Core, at the Eden Project in Cornwall. As well as exploring cutting edge developments in photovoltaics (PV) this revised edition also includes the latest data from the 2006 Carbon Trust report on wave and tide, and new material on the latest advances in bioenergy and marine technologies. Buildings are currently a major part of the carbon emissions problem. This book indicates how they may become part of the solution.

[The SAGE Handbook of Nature](#)

People's well-being, industrial competitiveness and the overall functioning of society are dependent on safe, secure, sustainable and affordable energy. The energy infrastructure which will power citizens' homes, industry and services in 2050, as well as the buildings which people will use, are being designed and built now. The pattern of energy production and use in 2050 is already being set.

[Biomass Volume Estimation and Valorization for Energy](#)

[Biomass as Energy Source](#)

This proceedings volume represents the culmination of nearly three years of planning, organizing and carrying out of a NATO Advanced Study Institute on Biomass Utilization. The effort was initiated by Dr. Harry Sobel, then Editor of Biosources Digest, and a steering committee representing the many disciplines that this field brings together. . . When the fiscal and logistical details of the original plan could not be worked out, the idea was temporarily suspended. In the spring of 1982, the Renewable Materials Institute of the State University of New York at the College of Environmental Science and Forestry in Syracuse, New York revived the plan. A number of modifications had to be made, including the venue which was changed from the U.S.A. to Portugal. Additional funding beyond the basic support provided by the Scientific Affairs Division of NATO had to be obtained. Ultimately there were supplementary grants from the Foundation for Microbiology and the Anne S. Richardson Fund to assist student participants. The New York State College of Forestry Foundation, Inc. provided major support through the Renewable Materials Institute. The ASI was held in Alcabideche, Portugal from September 26 to October 9, 1982. Eighty participants including fifteen principal lecturers were assembled at the Hotel Sintra Estoril for the program that was organized as a comprehensive course on biomass utilization. The main lectures were supplemented by relevant short papers offered by the participants.

Current Developments in Biotechnology and Bioengineering

With pressure increasing to utilise wastes and residues effectively and sustainably, the production of biogas represents one of the most important routes towards reaching national and international renewable energy targets. The biogas handbook: Science, production and applications provides a comprehensive and systematic guide to the development and deployment of biogas supply chains and technology. Following a concise overview of biogas as an energy option, part one explores biomass resources and fundamental science and engineering of biogas production, including feedstock characterisation, storage and pre-treatment, and yield optimisation. Plant design, engineering, process optimisation and digestate utilisation are the focus of part two. Topics considered include the engineering and process control of biogas plants, methane emissions in biogas production, and biogas digestate quality, utilisation and land application. Finally, part three discusses international experience and best practice in biogas utilisation. Biogas cleaning and upgrading to biomethane, biomethane use as transport fuel and the generation of heat and power from biogas for stationery applications are all discussed. The book concludes with a review of market development and biomethane certification schemes. With its distinguished editors and international team of expert contributors, The biogas handbook: Science, production and applications is a practical reference to biogas technology for process engineers, manufacturers, industrial chemists and biochemists, scientists, researchers and academics working in this field. Provides a concise overview of biogas as an energy option Explores biomass resources for production Examines plant design and engineering and process optimisation

Inclusive Green Growth

Sustainable Resource Recovery and Zero Waste Approaches covers waste reduction, biological, thermal and recycling methods of waste recovery, and their conversion into a variety of products. In addition, the social, economic and environmental aspects are also explored, making this a useful textbook for environmental courses and a reference book for both universities and companies. Provides a novel approach on how to achieve zero wastes in a society Shows the roadmap on achieving Sustainable Development Goals Considers critical aspects of municipal waste management Covers recent developments in waste biorefinery, thermal processes, anaerobic digestion, material recycling and landfill

mining

Agricultural Waste and Residues

This book is dedicated to the reuse of waste and residues from the agricultural sector. Plant residues, as well as animal manure and residues from animal breeding, contain useful elements that can be processed for production of fertilizers, compost for soil recultivation, and biofuels. The emerging energy and resources crisis calls for development of sustainable reuse of waste and residues. This book contains eight chapters divided into four sections. The first section contains the introductory chapter from the editor. The second section is related to the preparation of fertilizers and compost for soil amelioration from agricultural residues and waste water. The third section considers the use of agricultural waste for solid biofuels and biogas. The fourth section discusses sustainability and risk assessment related to the use of agricultural waste and residues.

Emerging Technologies and Biological Systems for Biogas Upgrading

Global energy use is approximately 140 000 TWh per year. Interestingly, biomass production amounts to approximately 270 000 TWh per year, or roughly twice as much, whereas the official figure of biomass use for energy applications is 10-13% of the global energy use. This shows that biomass is not a marginal energy resource but more than capable of

Biogas Energy

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