This multi-contributed handbook focuses on the latest workings of IoT (internet of Things) and Big Data. As the resources are limited, it's the endeavor of the authors to support and bring the information into one resource. The book is divided into 4 sections that covers IoT and technologies, the future of Big Data, algorithms, and case studies showing IoT and Big Data in various fields such as health care, manufacturing and automation.

Features
Focuses on the latest workings of IoT and Big Data
Discusses the emerging role of technologies and the fast-growing market of Big Data
Covers the movement toward automation with hardware, software, and sensors, and trying to save on energy resources
Offers the latest technology on IoT
Presents the future horizons on Big Data

The gradual increase of population and the consequential rise in the energy demands in the recent years have led to the overwhelming use of fossil fuels. Hydrogen has recently gained substantial interest because of its outstanding features to be used as clean energy carrier and energy vector. Moreover, hydrogen appears to be an effective alternative to tackle the issues of energy security and greenhouse gas emissions given that it is widely recognized as a clean fuel with high energy capacity. Hydrogen can be produced by various techniques such as thermochemical, hydrothermal,
electrochemical, electrolytic, biological and photocatalytic methods as well as hybrid systems. New Dimensions in Production and Utilization of Hydrogen emphasizes on the research, development and innovations in the production and utilization of hydrogen in the industrial biorefining, hydrotreating and hydrogenation technologies, fuel cells, aerospace sector, pharmaceuticals, metallurgy, as well as bio-oil upgrading. Moreover, the supply chain analysis, lifecycle assessment, techno-economic analysis, as well as strengths and threats of global hydrogen market are covered in the book. This book provides many significant insights and scientific findings of key technologies for hydrogen production, storage and emerging applications. The book serves as a reference material for chemical and biochemical engineers, mechanical engineers, physicists, chemists, biologists, biomedical scientists and scholars working in the field of sustainable energy and materials. Discusses the efficient usage of hydrogen as standalone fuel or feedstock in downstream processing Outlines key technologies for hydrogen production and their emerging applications Includes innovative approaches to the research and applications of hydrogen, including hydrotreating technologies, fuel cell vehicles and green fuel synthesis, the aerospace sector, pharmaceuticals, carbon dioxide hydrogenation, and bio-oils upgrading Serves as a reference for chemical, biochemical, and mechanical engineers, physicists, chemists, biologists, and biomedical scientists working in sustainable energy and materials In addition to the three plenary sessions, this volume
contains some of the exemplary papers that were presented at the 2011 conference; representing a collection of leading research in management control and performance measurement and providing a significant contribution to the growing literature in the area.

The Book Is An Effort To Present The Status Of Energy Production And Energy Supply To Meet Energy Demand In The Country; And Options To Counter The Challenges Of The Energy Sector In The Next Millennium. Forecasts point to a huge increase in energy demand over the next 25 years, with a direct and immediate impact on the exhaustion of fossil fuels, the increase in pollution levels and the global warming that will have significant consequences for all sectors of society. Irrespective of the likelihood of these predictions or what researchers in different scientific disciplines may believe or publicly say about how critical the energy situation may be on a world level, it is without doubt one of the great debates that has stirred up public interest in modern times. We should probably already be thinking about the design of a worldwide strategic plan for energy management across the planet. It would include measures to raise awareness, educate the different actors involved, develop policies, provide resources, prioritise actions and establish contingency plans. This process is complex and depends on political, social, economic and technological factors that are hard to take into account simultaneously. Then, before such a plan is formulated, studies such as those described in this book can serve to illustrate what Information and
Communication Technologies have to offer in this sphere and, with luck, to create a reference to encourage investigators in the pursuit of new and better solutions. "This book brings together advanced research on diverse topics in wireless communications and networking, including the latest developments in broadband technologies, mobile communications, wireless sensor networks, network security, and cognitive radio networks"--

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 book covers energy storage systems, bioenergy and hydrogen economy, grid integration of renewable energy systems, distributed generation, economic analysis, and environmental impacts of renewable energy systems. The overall approaches are interdisciplinary and comprehensive, covering economic, environmental, and grid integration issues as well as the physical and engineering aspects. Core issues discussed include mechanical, electrical, and thermal energy storage systems, batteries, fuel cells, biomass and biofuels, hydrogen economy, distributed generation, a brief presentation of microgrids, and in-depth discussions of economic analysis and methods of renewable energy systems, environmental impacts, life-cycle analysis, and
energy conservation issues. With several solved examples, holistic material presentation, in-depth subject matter discussions and self-content material presentation, this textbook will appeal strongly to students and professional and nonprofessional readers who wish to understand this fascinating subject. Readers are encouraged to solve the problems and questions, which are useful ways to understand and apply the concepts and the topics included.

Energy Management in Wireless Sensor Networks discusses this unavoidable issue in the application of Wireless Sensor Networks (WSN). To guarantee efficiency and durability in a network, the science must go beyond hardware solutions and seek alternative software solutions that allow for better data control from the source to delivery. Data transfer must obey different routing protocols, depending on the application type and network architecture. The correct protocol should allow for fluid information flow, as well as optimizing power consumption and resources – a challenge faced by dense networks. The topics covered in this book provide answers to these needs by introducing and exploring computer-based tools and protocol strategies for low power consumption and the implementation of routing mechanisms which include several levels of intervention, ranging from deployment to network operation. Explores ways to manage energy consumption during the design and implementation of WSN Helps users implement an increase in network longevity Presents intrinsic characteristics of wireless sensor networks This book examines the regional order in the Gulf Region and the wider Middle East, focusing on regional rivalries and security alliances. The authors analyze the regional system in terms of its general structure as well as the major inter-state and non-state security alliances. The structure of the regional system in the wider Middle East and the shake-ups it has experienced explain the ongoing regional rivalry and
polarization since 2011 in hotspots such as Syria, Yemen, and Libya. As such, the various chapters address regional transition and power dynamics between and among regional great powers and non-state militant actors across the Gulf Region and the wider Middle East in terms of the alliance building, persistence, and disintegration since 2011.

Comprehensive Energy Systems provides a unified source of information covering the entire spectrum of energy, one of the most significant issues humanity has to face. This comprehensive book describes traditional and novel energy systems, from single generation to multi-generation, also covering theory and applications. In addition, it also presents high-level coverage on energy policies, strategies, environmental impacts and sustainable development. No other published work covers such breadth of topics in similar depth. High-level sections include Energy Fundamentals, Energy Materials, Energy Production, Energy Conversion, and Energy Management. Offers the most comprehensive resource available on the topic of energy systems Presents an authoritative resource authored and edited by leading experts in the field Consolidates information currently scattered in publications from different research fields (engineering as well as physics, chemistry, environmental sciences and economics), thus ensuring a common standard and language

Climate change is increasing due to the anthropogenic emission of greenhouse gases. The majority of these are due to the production and consumption of energy. According to the latest estimates, global energy demand could triple by 2050, and by then, 70% of the world’s population will live in cities. The challenge for future cities is the implementation of a mechanism that minimizes the need for injection of new energy resources in them, so that a high level of self-sufficiency can be achieved through the concept of circular
economy, thus partially mitigating the impacts of climate change. Using solar energy today is considered to be one of the best solutions that can be installed in buildings to help with this issue. This book addresses several relevant aspects related to energy saving at cities, including a deep survey of research topics and scientific collaborations in energy saving. The main research topics carried out are related to sustainability, solar energy, the use of rooftops for energy generation, energy conversion from urban biomass or residues, wind energy, and public and private urban energy saving.

This book provides an overview of contemporary trends and challenges in maritime energy management (MEM). Coordinated action is necessary to achieve a low carbon and energy-efficient maritime future, and MEM is the prevailing framework aimed at reducing greenhouse gas emissions resulting from maritime industry activities. The book familiarizes readers with the status quo in the field, and paves the way for finding solutions to perceived challenges. The 34 contributions cover six important aspects: regulatory framework; energy-efficient ship design; energy efficient ship and port operation; economic and social dimensions; alternative fuels and wind-assisted ship propulsion; and marine renewable energy. This pioneering work is intended for researchers and academics as well as practitioners and policymakers involved in this important field.

The first book in the field to incorporate fundamentals of energy systems and their applications to smart grid, along with advanced topics in modeling and control. This book provides an overview of how multiple sources and loads are connected via power electronic devices. Issues of storage technologies are discussed, and a comparison summary is given to facilitate the design and selection of storage types. The need for real-time measurement and controls are
pertinent in future grid, and this book dedicates several chapters to real-time measurements such as PMU, smart meters, communication scheme, and protocol and standards for processing and controls of energy options. Organized into nine sections, Energy Processing for the Smart Grid gives an introduction to the energy processing concepts/topics needed by students in electrical engineering or non-electrical engineering who need to work in areas of future grid development. It covers such modern topics as renewable energy, storage technologies, inverter and converter, power electronics, and metering and control for microgrid systems. In addition, this text: Provides the interface between the classical machines courses with current trends in energy processing and smart grid Details an understanding of three-phase networks, which is needed to determine voltages, currents, and power from source to sink under different load models and network configurations Introduces different energy sources including renewable and non-renewable energy resources with appropriate modeling characteristics and performance measures Covers the conversion and processing of these resources to meet different DC and AC load requirements Provides an overview and a case study of how multiple sources and loads are connected via power electronic devices Benefits most policy makers, students and manufacturing and practicing engineers, given the new trends in energy revolution and the desire to reduce carbon output Energy Processing for the Smart Grid is a helpful text for undergraduates and first year graduate students in a typical engineering program who have already taken network analysis and electromagnetic courses. This comprehensive handbook has become recognized as the definitive stand-alone energy manager's desk reference, used by thousands of professionals throughout the industry. Newly revised and edited, this eighth edition includes
significant updates to energy management controls systems, commissioning, measurement and verification, and high performance green buildings. Also updated are chapters on motors and drives, HVAC systems, lighting, alternative energy systems, building envelope, performance contracting and natural gas purchasing. You'll find coverage of every component of effective energy management, including energy auditing, economic analysis, boilers and steam systems, heat recovery, cogeneration, insulation, thermal storage, indoor air quality, utility rates, energy systems maintenance, and more. Detailed illustrations, charts and other helpful working aids are provided throughout. Volume One Includes Chapters 1-14 and Appendices.

Machine learning approaches has the capability to learn and adapt to the constantly evolving demands of large Internet-of-energy (IoE) network. The focus of this book is on using the machine learning approaches to present various solutions for IoE network in smart cities to solve various research gaps such as demand response management, resource management and effective utilization of the underlying ICT network. It provides in-depth knowledge to build the technical understanding for the reader to pursue various research problems in this field. Moreover, the example problems in smart cities and their solutions using machine learning are provided as relatable to the real-life scenarios. Aimed at Graduate Students, Researchers in Computer Science, Electrical Engineering, Telecommunication Engineering, Internet of Things, Machine Learning, Green computing, Smart Grid, this book: Covers all aspects of Internet of Energy (IoE) and smart cities including research problems and solutions. Points to the solutions provided by machine learning to optimize the grids within a smart city set-up. Discusses relevant IoE design principles and architecture. Helps to automate various services in smart cities for energy
management. Includes case studies to show the effectiveness of the discussed schemes. As the human population expands and natural resources become depleted, it becomes necessary to explore other sources for energy consumption and usage. Renewable and Alternative Energy: Concepts, Methodologies, Tools, and Applications provides a comprehensive overview of emerging perspectives and innovations for alternative energy sources. Highlighting relevant concepts on energy efficiency, current technologies, and ongoing industry trends, this is an ideal reference source for academics, practitioners, professionals, and upper-level students interested in the latest research on renewable energy.

The fed. gov't. is the nation's single largest energy consumer, spending approximately $17 billion in FY 2007. A number of statutes and executive orders have established and revised goals directing agencies to reduce energy consumption and greenhouse gas emissions -- such as carbon dioxide, which results from combustion of fossil fuels and natural processes, among other things -- and increase renewable energy use. This report determines the extent to which: (1) fed. agencies met energy efficiency, greenhouse gas emission, and renewable energy goals in FY 2007; (2) fed. agencies have made progress in each of these areas in the recent past; and (3) six selected agencies are poised to meet energy goals into the future. Illus.

Smart grid and microgrid technology are growing exponentially as they are adopted throughout the world. These new technologies have revolutionized the way electricity is produced, delivered, and consumed, and offer a plethora of benefits as well as the potential for further growth. It is critical to examine the current stage of smart grid and microgrid development as well as the direction they are headed as they continue to expand in order to ensure that
cost-effective, reliable, and efficient systems are put in place. The Research Anthology on Smart Grid and Microgrid Development is an all-encompassing reference source of the latest innovations and trends within smart grid and microgrid development. Detailing benefits, challenges, and opportunities, it is a crucial resource to fully understand the current opportunities that smart grids and microgrids present around the world. Covering a wide range of topics such as traditional grids, future smart grids, electrical distribution systems, and microgrid integration, it is ideal for engineers, policymakers, systems developers, technologists, researchers, government officials, academicians, environmental groups, regulators, utilities specialists, industry professionals, and students. Conducting a systematic and comparative review of energy and environmental issues, especially at the regional and national levels, can improve communication among different disciplines and be helpful for managers, politicians, and stakeholders involved in energy and environmental systems. Sustainable Systems and Energy Management at the Regional Level: Comparative Approaches provides an interdisciplinary look at the possible relationships which exist between energy and the environment. Relevant theoretical frameworks and the latest empirical research findings on the impacts of regulation policies, market-facilitation policies, and communication models and policies are reviewed with the aim of improving understanding and strategy. This book provides insights on a broad spectrum of renewable and sustainable energy technologies from the world’s leading experts. It highlights the latest achievements in policy, research and applications, keeping readers up-to-date on progress in this rapidly advancing field. Detailed studies of technological breakthroughs and optimizations are contextualized with in-depth examinations of experimental
Online Library Energy Management Issues And Challenges In The Twenty First Century 1st Edition

and industrial installations, connecting lab innovations to success in the field. The volume contains selected papers presented at technical and plenary sessions at the World Renewable Energy Congress, the world's premier conference on renewable energy and sustainable development. Held every two years, the Congress provides an international forum that attracts hundreds of delegates from more than 60 countries.

With the increasing worldwide trend in population migration into urban centers, we are beginning to see the emergence of the kinds of mega-cities which were once the stuff of science fiction. It is clear to most urban planners and developers that accommodating the needs of the tens of millions of inhabitants of those megalopolises in an orderly and uninterrupted manner will require the seamless integration of and real-time monitoring and response services for public utilities and transportation systems. Part speculative look into the future of the world’s urban centers, part technical blueprint, this visionary book helps lay the groundwork for the communication networks and services on which tomorrow’s “smart cities” will run. Written by a uniquely well-qualified author team, this book provides detailed insights into the technical requirements for the wireless sensor and actuator networks required to make smart cities a reality.

This book constitutes the proceedings of the 7th International Conference on Wireless and Satellite Services, WiSATS 2015, held in Bradford, UK, in July 2015. The conference was formerly known as the International Conference on Personal Satellite Services (PSATS) mainly covering topics in the satellite domain. As the scope of the conference widened to include wireless systems, the conference was renamed to WiSATS. The 29 revised papers were presented at the conference in three technical sessions and one special session on “Network Coding for Satellites”. WiSATS 2015
also hosted two workshops along with the main conference: The first workshop, Communication Applications in Smart Grid (CASG 2015), focused on the merging area of using communication technology within the electricity power grid for smart monitoring and control. The second workshop, Advanced Next-Generation Broadband Satellite Systems (BSS 2015), focused on the use of satellite systems for providing next-generation broadband services.

Wireless sensor networks (WSNs) consist of tiny sensors capable of sensing, computing, and communicating. Due to advances in semiconductors, networking, and material science technologies, it is now possible to deploy large-scale WSNs. The advancement in these technologies has not only decreased the deployment and maintenance costs of networks but has also increased the life of networks and made them more rugged. As WSNs become more reliable with lower maintenance costs, they are being deployed and used across various sectors for multiple applications. This book discusses the applications, challenges, and design and deployment techniques of WSNs.

The ‘Arab Spring’ of 2011 has affected the countries of the region to varying degrees, including the Gulf Cooperation Council (GCC) members, comprising Saudi Arabia, Kuwait, Qatar, the United Arab Emirates, Oman and Bahrain. The GCC has become a significant regional bloc playing a vital economic and political role far beyond its shores, given its geopolitical strategic location, a preponderance of global energy reserves and a major international player through the use of accumulated financial reserves. A new Gulf is rising, one that is more self assertive, looking to expand its membership to other Arab countries such as Jordan and Morocco, while at the same time strengthening the bloc’s relationship with current and emerging trading and strategic partners in Europe, USA and Asia. Regional and international
realities, especially the uncertainties unleashed by the ‘Arab Spring’, are forcing Gulf leadership to initiate new policies involving closer cooperation amongst GCC countries to address emerging challenges. This volume brings together thirty renowned academics and specialists to examine a range of multifaceted social, political and economic issues facing the GCC in key areas such as: · Diversification from a high dependency on a narrow hydrocarbon base · Social transformation, youth employment and effective gender participation · Outward and inward foreign direct investment flows · Prospects for education reforms and e-learning. · Sustainable security in oil, renewable energy (including nuclear) and food · Corporate governance, transparency and enhancing the private sector's operating environment · The role and governance of Gulf Sovereign Wealth Funds in investing their surpluses. The volume also offers insights for challenges facing the GCC in monetary union, expanding the regional debt market and Sukuk issuance, GCC intellectual property rights application, detailed assessments of individual GCC country risk analysis, as well as the sustainability of long term government fiscal stimulus programs at the expense of private sector involvement.

Current research fields in science and technology were presented and discussed at the EKC2008, informing about the interests and directions of the scientists and engineers in EU countries and Korea. The Conference has emerged from the idea of bringing together EU and Korea to get to know each other better, especially in fields of science and technology. The focus of the conference is put on the topics: