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Energy Systems - Nick Jenkins 2020-02

Modern societies require energy systems to provide energy for cooking, heating, transport, and materials processing, as well as for electricity generation. Energy systems include the primary fuel, its conversion, and transport to the point of use. In many cases this primary fuel is still a fossil fuel, a one-use resource derived from a finite supply within our planet, causing considerable damage to the environment. After 300 years of increasing reliance on fossil fuels, particularly coal, it is becoming ever clearer that the present energy systems need to change. In this Very Short Introduction Nick Jenkins explores our historic investment in the exploitation of fossil energy resources and their current importance, and discusses the implications of our increasing rate of energy use. He considers the widespread acceptance by scientists and policy makers that our energy systems must reduce emissions of CO₂ and other greenhouse gases, and looks forward to the radical changes in fuel technology that will be necessary to continue to provide energy supplies in a sustainable manner, and extend access across the developing world. Considering the impact of changing to an environmentally benign and low-carbon energy system, Jenkins also looks at future low-carbon energy systems which would use electricity from a variety of renewable energy sources, as well as the role of nuclear power in our energy use. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine

facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Alternating Currents Or Counter-revolution? - Lewis T. Evans 2005

Lewis Evans and Richard Meade place New Zealand's current institutional arrangements for its electricity sector within the context of successive waves of economic reform. They compare these arrangements with developments internationally, drawing together lessons for future policy making both in New Zealand and overseas. *Alternating currents or counter-revolution?* is a work of political economy - and the book carefully analyses the interplay between technology, economics and politics that has at different times driven the sector. Controversially, the authors argue that the market reforms of the 1980s and 1990s provided greater supply security than the more centralised arrangements prevailing in the past - and that New Zealand's reversion to more centralised and political control since the late 1990s has resulted in an unstable half-way house that hinders private electricity investments and reinforces this trend.

Building Performance Simulation for Design and Operation - Jan Hensen 2011

Effective building performance simulation can reduce the environmental impact of the built environment, improve indoor quality and productivity, and facilitate future innovation and technological progress in construction. It draws on many disciplines, including physics, mathematics, material science, biophysics and human behavioural, environmental and computational sciences. The discipline itself is

continuously evolving and maturing, and improvements in model robustness and fidelity are constantly being made. This has sparked a new agenda focusing on the effectiveness of simulation in building life-cycle processes. Building Performance Simulation for Design and Operation begins with an introduction to the concepts of performance indicators and targets, followed by a discussion on the role of building simulation in performance-based building design and operation. This sets the ground for in-depth discussion of performance prediction for energy demand, indoor environmental quality (including thermal, visual, indoor air quality and moisture phenomena), HVAC and renewable system performance, urban level modelling, building operational optimization and automation. Produced in cooperation with the International Building Performance Simulation Association (IBPSA), and featuring contributions from fourteen internationally recognised experts in this field, this book provides a unique and comprehensive overview of building performance simulation for the complete building life-cycle from conception to demolition. It is primarily intended for advanced students in building services engineering, and in architectural, environmental or mechanical engineering; and will be useful for building and systems designers and operators.

Carbon Capture and Storage - Mai Bui
2019-11-29

This book will provide the latest global perspective on the role and value of carbon capture and storage (CCS) in delivering temperature targets and reducing the impact of global warming. As well as providing a comprehensive, up-to-date overview of the major sources of carbon dioxide emission and negative emissions technologies, the book also discusses technical, economic and political issues associated with CCS along with strategies to enable commercialisation.

Lighting for Driving - Peter R. Boyce 2008-12-04
Integrates Vehicle, Signal, and Road Lighting into a Unified System Many people drive many miles after dark and rely on lighting to help them gather information about the road ahead and the presence and intentions of other people on and near the road. With new technology on the industry's horizon, *Lighting for Driving*:

Roads, Vehicle, Signs and Signals conveys the crucial role lighting plays in road safety and examines how it could be used more effectively. Authored by a lighting and visibility expert, this book explains the thinking and scientific reasoning behind various forms of lighting and analyzes their contribution to the driver's understanding of real and potential road hazards. Filled with useful information, this resource straightforwardly addresses a wide range of safety factors encountered in real driving situations, such as weather conditions, complex signage, and driver age. It also deals with the often-ignored consequences of too much light, such as light trespass and sky glow. *Comprehensively Explores the Field, Emphasizing Improved Safety Vehicle, road, sign, and signal lighting* are provided to enable drivers to reach their destinations quickly and safely. However, the attention given to how these forms of lighting function is likely to change as new technology is introduced and understanding of ergonomics and human factors improves. This book effectively illustrates how these forms of lighting can be modified to work together to best provide a coherent flow of information to the driver.

Reforming the Chinese Electricity Supply Sector
- Michael G. Pollitt 2020-06-29

The Chinese electricity sector is the largest in the world, covering well over 20% of the world's electricity supply. While many other countries liberalized their electricity systems in the 1990s, thereby creating competitive wholesale and retail electricity markets, China's move towards liberalization has advanced at a slower pace - until now. Following the China State Council's publication of the No. 9 document on 'Deepening Reform of the Power Sector', this book reflects on the ambitious new round of reforms aimed at introducing competitive wholesale electricity markets and incentive regulation for its power grids. Written in collaboration with Hao Chen, Lewis Dale and Chung-Han Yang, this book provides lessons for China's reforms from international experience, combining a detailed review of reforms from around the world with specific application to China and focuses on how the industrial price of electricity is determined in a liberalized power system.

District Heating and Cooling Networks in the

European Union - Antonio Colmenar-Santos
2017-07-18

This book evaluates the potential of the combined use of district heating networks and cogeneration in the European Union (EU). It also proposes measures to remove barriers hindering their widespread implementation, formulates policies for their implementation, and evaluates their economic, energy, and environmental consequences. The book presents a preliminary assessment of the likely cost and the impact of widespread adoption of district heating networks and cogeneration carried out in three cities that represent the variety of climatic conditions in the EU. Based on this assessment, it is estimated that by undertaking the maximum economically feasible implementation across the EU, fuel savings of €95M/year would be achieved, representing energy savings of 6,400 petajoules (PJ), which is around 15% of the total final energy consumption in the EU in 2013 (46,214.5 PJ). Using simple and quick calculations and not specific software, the method used allows the evaluation of the potential benefits of retrofitting existing power plants into cogeneration plants and connecting them to nearby heating networks. In light of increasing energy costs and environmental concerns, the book is of interest to heating engineers, city planners, and policy-makers around the globe.

Nuclear Law - International Atomic Energy Agency 2022-01-31

This open access book traces the journey of nuclear law: its origins, how it has developed, where it is now, and where it is headed. As a discipline, this highly specialized body of law makes it possible for us to benefit from the life-saving applications of nuclear science and technology, including diagnosing cancer as well as avoiding and mitigating the effects of climate change. This book seeks to give readers a glimpse into the future of nuclear law, science and technology. It intends to provoke thought and discussion about how we can maximize the benefits and minimize the risks inherent in nuclear science and technology. This compilation of essays presents a global view in discipline as well as in geography. The book is aimed at representatives of governments—including regulators, policymakers and lawmakers—as well

representatives of international organizations and the legal and insurance sectors. It will be of interest to all those keen to better understand the role of law in enabling the safe, secure, and peaceful use of nuclear technology around the world. The contributions in this book are written by leading experts, including the IAEA's Director General, and discuss the four branches of nuclear law—safety, security, safeguards and nuclear liability—and the interaction of nuclear law with other fields of national and international law.

Cities and Climate Change - Harriet Bulkeley
2013-05-07

Climate change is one of the most significant global challenges facing the world today. It is also a critical issue for the world's cities. Now home to over half the world's population, urban areas are significant sources of greenhouse gas emissions and are vulnerable to the impacts of climate change. Responding to climate change is a profound challenge. A variety of actors are involved in urban climate governance, with municipal governments, international organisations, and funding bodies pointing to cities as key arenas for response. This book provides the first critical introduction to these challenges, giving an overview of the science and policy of climate change at the global level and the emergence of climate change as an urban policy issue. It considers the challenges of governing climate change in the city in the context of the changing nature of urban politics, economics, society and infrastructures. It looks at how responses for mitigation and adaptation have emerged within the city, and the implications of climate change for social and environmental justice. Drawing on examples from cities in the north and south, and richly illustrated with detailed case-studies, this book will enable students to understand the potential and limits of addressing climate change at the urban level and to explore the consequences for our future cities. It will be essential reading for undergraduate students across the disciplines of geography, politics, sociology, urban studies, planning and science and technology studies.

Modeling, Simulation and Optimization of Wind Farms and Hybrid Systems - Karam Maalawi 2020-03-25

The reduction of greenhouse gas emissions is a

major governmental goal worldwide. The main target, hopefully by 2050, is to move away from fossil fuels in the electricity sector and then switch to clean power to fuel transportation, buildings and industry. This book discusses important issues in the expanding field of wind farm modeling and simulation as well as the optimization of hybrid and micro-grid systems. Section I deals with modeling and simulation of wind farms for efficient, reliable and cost-effective optimal solutions. Section II tackles the optimization of hybrid wind/PV and renewable energy-based smart micro-grid systems.

Wind Power Generation and Wind Turbine Design - Wei Tong 2010-04-30

The purpose of this book is to provide engineers and researchers in both the wind power industry and energy research community with comprehensive, up-to-date, and advanced design techniques and practical approaches. The topics addressed in this book involve the major concerns in the wind power generation and wind turbine design.

Energy and Behaviour - Marta Lopes 2019-11-25
Changes to energy behaviour — the role of people and organisations in energy production, use and efficiency — are critical to supporting a societal transition towards a low carbon and more sustainable future. However, which changes need to be made, by whom, and with what technologies are still very much under discussion. This book, developed by a diverse range of experts, presents an international and multi-faceted approach to the sociotechnical challenge of engaging people in energy systems and vice versa. By providing a multidisciplinary view of this field, it encourages critical thinking about core theories, quantitative and qualitative methodologies, and policy challenges. It concludes by addressing new areas where additional evidence is required for interventions and policy-making. It is designed to appeal to new entrants in the energy-efficiency and behaviour field, particularly those taking a quantitative approach to the topic. Concurrently, it recognizes ecological economist Herman Daly's insight: what really counts is often not countable. Introduces the major disciplinary and interdisciplinary approaches to understanding energy and behaviour Delivers a cross-sectoral overview including energy behaviour in

buildings, industry, transportation, smart grids, and smart cities Reviews a selection of innovative energy behaviour modelling approaches, including agent-based modelling, optimization, and decision support Critically addresses the importance of interventions, policies, and regulatory design

Principles of Public Utility Rates - James C. Bonbright 1966

The Power of Transformation - International Energy Agency 2014-02-13

Wind power and solar photovoltaics (PV) are crucial to meeting future energy needs while decarbonising the power sector. Deployment of both technologies has expanded rapidly in recent years, one of the few bright spots in an otherwise bleak picture of clean energy progress. However, the inherent variability of wind power and solar PV raises unique and pressing questions. Can power systems remain reliable and cost-effective while supporting high shares of variable renewable energy (VRE)? And if so, how? Based on a thorough review of the integration challenge, this publication gauges the economic significance of VRE integration impacts, highlights the need for a system-wide approach to integrating high shares of VRE and recommends how to achieve a cost-effective transformation of the power system. This book summarises the results of the third phase of the Grid Integration of VRE (GIVAR) project, undertaken by the IEA over the past two years. It is rooted in a set of seven case studies, comprising 15 countries on four continents. It deepens the technical analysis of previous IEA work and lays out an analytical framework for understanding the economics of VRE integration impacts. Based on detailed modelling, the impact of high shares of VRE on total system costs is analysed. In addition, the four flexible resources which are available to facilitate VRE integration - generation, grid infrastructure, storage and demand side integration - are assessed in terms of their technical performance and cost-effectiveness.

Energy Efficiency in Domestic Appliances and Lighting - Paolo Bertoldi 2022-05-23

This book contains peer-reviewed papers presented at the 10th International Conference on Energy Efficiency in Domestic Appliances and

Lighting (EEDAL'19), held in Jinan, China from 6-8 November 2019. Energy efficiency helps to mitigate CO2 emissions and at the same time increases the security of energy supply. Energy efficiency is recognized as the cleanest, quickest and cheapest energy source. Not only this, but energy efficiency brings several additional benefits for society and end-users, such as lower energy costs, reduced local pollution, better outdoor and indoor air quality, etc. However, in some sectors, such as the residential sector, barriers to investments in energy efficiency remain. Legislation adopted in several jurisdictions (EU, Japan, USA, China, India, Australia, Brazil, etc.) helps in removing barriers and fosters investments in energy efficiency. These initiatives complement innovative financing schemes for energy efficiency, the provision of energy services by energy service companies and different types of information programs. At the same time, progress in appliance technologies and in solid state lighting offer high levels of efficiency. LED lighting is an example. As with previous conferences in this series, EEDAL'19 provided a unique forum to discuss and debate the latest developments in energy and environmental impact of households, including appliances, lighting, heating and cooling equipment, electronics, smart meters, consumer behavior, and policies and programs. EEDAL addressed non-technical issues such as consumer behavior, energy access in developing countries, and demand response.

Peak Energy Demand and Demand Side Response - Jacopo Torriti 2015-07-16

With different intensities, depending on the season, every morning and evening of any weekday there are the same peaks in electricity demand. Peaks can bring about significantly negative environmental and economic impacts. Demand Side Response is a relatively recent solution in Europe which has the potential to reduce peak demand and ease impending capacity shortages. Peak Energy Demand and Demand Side Response presents evidence on a set of Demand Side Response activities, ranging from price-based to incentive-based programmes and policies. Examples are drawn from different programmes for both residential and non-residential sectors of electricity demand, including Time of Use tariffs, Critical Peak

Pricing Automated Demand Controllers and Ancillary Services. The book also looks at the actual energy saving impacts of smart meters, the activities which constitute peak demand and the potential opportunities associated with European smart grids and Capacity Markets. This is the first book presenting comprehensive analysis of the impacts, cost benefits and risks associated with Demand Side Response programmes and policies. It should be of interest to students, scholars and policy-makers in the areas of energy, environmental economics and applied economics.

Computer Care V. Service Systems Enterprises, Inc - 1991

Statutory security of supply report - Great Britain: Department of Energy and Climate Change 2010-11-04

The Government and Ofgem are required to report annually to Parliament on the availability of electricity and gas for meeting the reasonable demands of consumers in Great Britain. This report succeeds and expands upon the previous reports entitled "Energy markets outlook". The projection of peak demand for electricity remains at 60GW whilst generation capacity stands at 85.3GW. However, the coming decade will see many changes in the electricity markets, with the closure of a number of coal and oil fired plants that are considered too polluting by modern standards, and nuclear plants that are scheduled to come to the end of their working lives. New plants being built or going through the planning process, and renewable projects, will replace the capacity due to close with cleaner technologies, enhance security of supply, and contribute to reduction of greenhouse gas emissions. The security of gas supply is broadly benign in the near term, though it is not risk-free. Whilst UK production is forecast to decline, there is an increasingly large and diverse range of import sources on which to draw. New import and storage capacity is also identified in the report. The report also looks at the security of supply of oil. UK oil production is declining and oil imports are forecast to increase through the 2025 timeframe. Transport accounted for 85 per cent of energy consumption of oil products in 2009, and moves to reduce that level are not expected to show significant reductions for

10-15 years.

Hawaii State Data Book - Mutual Publishing
2012

Handbook Of Renewable Energy Technology

- Zobaa Ahmed F 2011-01-26

Effects of environmental, economic, social, political and technical factors have led to the rapid deployment of various sources of renewable energy-based power generation. The incorporation of these generation technologies have led to the development of a broad array of new methods and tools to integrate this new form of generation into the power system network. This book, arranged into six sections, highlights various renewable energy based generation technologies, and consists a series of papers written by experts in their respective fields of specialization. The Handbook of Renewable Energy Technology will be of great practical benefit to professionals, scientists and researchers in the relevant industries, and will be of interest to those of the general public wanting to know more about renewable energy technologies.

Electricity Supply in the United Kingdom -
Electricity Council 1987

Avoiding Danger from Underground

Services - Great Britain, Health and Safety
Executive Staff 2014

**Centennial History of Coshocton County,
Ohio** - William J. Bahmer 1909

Spot Pricing of Electricity - Fred C. Schweppe
2013-03-07

There is a need for fundamental changes in the ways society views electric energy. Electric energy must be treated as a commodity which can be bought, sold, and traded, taking into account its time-and space-varying values and costs. This book presents a complete framework for the establishment of such an energy marketplace. The framework is based on the use of spot prices. In general terms: o An hourly spot price (in dollars per kilowatt hour) reflects the operating and capital costs of generating, transmitting and distributing electric energy. It varies each hour and from place to place. o The spot price based energy marketplace involves a

variety of utility-customer transactions (ranging from hourly varying prices to long-term, multiple-year contracts), all of which are based in a consistent manner on hourly spot prices.

These transactions may include customers selling to, as well as buying from, the utility. The basic theory and practical implementation issues associated with a spot price based energy marketplace have been developed and discussed through a number of different reports, theses, and papers. Each addresses only a part of the total picture, and often with a somewhat different notation and terminology (which has evolved in parallel with our growing experience). This book was xvii xviii Preface written to serve as a single, integrated sourcebook on the theory and imple mentation of a spot price based energy marketplace.

Managing Public Money - 2021

Smart Grids for Dummies - Chris Beard 2010

Regulation of the Power Sector - Ignacio J.
Pérez-Arriaga 2014-02-26

Regulation of the Power Sector is a unified, consistent and comprehensive treatment of the theories and practicalities of regulation in modern power-supply systems. The need for generation to occur at the time of use occasioned by the impracticality of large-scale electricity storage coupled with constant and often unpredictable changes in demand make electricity-supply systems large, dynamic and complex and their regulation a daunting task. Arranged in four parts, this book addresses both traditional regulatory frameworks and also liberalized and re-regulated environments. First, an introduction gives a full characterization of power supply including engineering, economic and regulatory viewpoints. The second part presents the fundamentals of regulation and the third looks at the regulation of particular components of the power sector in detail. Advanced topics and subjects still open or subject to dispute form the content of Part IV. In a sector where regulatory design is the key driver of both the industry efficiency and the returns on investment, Regulation of the Power Sector is directed at regulators, policy decision makers, business managers and researchers. It is a pragmatic text, well-tested by the authors'

quarter-century of experience of power systems from around the world. Power system professionals and students at all levels will derive much benefit from the authors' wealth of blended theory and real-world-derived know-how.

The costs and impacts of intermittency - 2006

Planning our electric future - Great Britain: Department of Energy and Climate Change 2011-07-12

This white paper sets the Government's proposals for reform of the UK's electricity system to ensure that the UK electricity supply is secure, low-carbon and affordable. This is especially crucial as we face a number of unprecedented challenges in the coming decades including the threat to security of supply as existing plant closes; the necessity to decarbonise electricity generation; the likelihood for a rise in electricity demand and electricity prices are also expected to rise. Broadly the strategy's approach consists of four parts: long term contracts for both low-carbon energy and capacity; institutional arrangements to support this contracting approach; continued grandfathering, supporting the principle of no retrospective change to low-carbon policy incentives, within a clear and rational planning cycle; and ensuring a liquid market that allows existing energy companies and new entrants to compete on fair terms

Behind and Beyond the Meter - Fereidoon Sioshansi 2020-02-01

The historical ways in which electricity was generated in large central power plants and delivered to passive customers through a one-

way transmission and distribution network - as everyone knows - is radically changing to one where consumers can generate, store and consume a significant portion of their energy needs energy locally. This, however, is only the first step, soon to be followed by the ability to share or trade with others using the distribution network. More exciting opportunities are possible with the increased digitalization of BTM assets, which in turn can be aggregated into large portfolios of flexible load and generation and optimized using artificial intelligence and machine learning. Examines the latest advances in digitalization of behind-the-meter assets including distributed generation, distributed storage and electric vehicles and - more important - how these assets can be aggregated and remotely monitored unleashing tremendous value and a myriad of innovative services and business models Examines what lies behind-the-meter (BTM) of typical customers and why managing these assets increasingly matter Describes how smart aggregators with intelligent software are creating value by optimizing how energy may be generated, consumed, stored or potentially shared or traded and between consumers; prosumers and prosumagers (that is, prosumers with storage) Explores new business models that are likely to disrupt the traditional interface between the incumbents and their customers

The Energy Regulation and Markets Review - David L. Schwartz 2016

Complete Dog Training Manual - Bruce Fogle 1997

A complete basic training programme for puppies and a guide to more advanced training techniques. Contains step-by-step colour photos.