S. Carlucci, Politecnico di Milano, Italy

**Comfortable Net Zero Energy Buildings**

A building optimization process based on the minimization of thermal discomfort

The energy design of a building can be considered and formalized as a multivariable optimization problem. Once (and if) objectives are all clearly and explicitly spelled out, the challenge for the designers is how to explore the set of building variants compatible with the given constraints and to isolate the one(s) best fulfilling the objectives. The set of variants compatible with the constraints is generally much larger of what can be explored in a reasonable time span, even by making some a priori choices to guide the design based on previous experience and a first order approximation of physical laws.

**Features**
- A new approach based on thermal discomfort minimization for designing net zero energy buildings
- An optimization process helping the designer to automatically search for the optimal solution among a large set of building variants
- The design of a real building

**Contents**

**Fields of interest**
- Energy Efficiency (incl. Buildings); Building Physics, HVAC; Interaction Design

**Target groups**
- Research

**Product category**
- Brief

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D. Radu, Schneider Electric, Grenoble, France; S. Bacha, University Joseph Fourier of Grenoble, Saint Martin D’Heres, France

**Lighting Circuits Characterization and Modeling**

Lighting Circuits Characterization and Modeling shows a complete background of lighting circuits (electrical lamps and associated electrical devices) as well as luminaries modeling and validation on real lighting power systems. This book contains the theoretical background related to lighting circuits (electrical lamps, power systems and associated switching devices) as well as looks at energy efficiency of lighting circuits. The authors discuss lighting theory, trends in power systems and lamps impact and interaction with the power system.

**Features**
- Describes transient, preheat and steady state modeling of lighting circuits
- Examines the interaction of lighting circuits with power systems
- Covers lighting technologies such as incandescent (standard and halogen), discharge lamps (low and high pressure) and light emitting diodes

**Contents**

**Fields of interest**
- Energy Systems; Circuits and Systems; Electronic Circuits and Devices

**Target groups**
- Research

**Product category**
- Monograph

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**Due August 2013**

2014. X, 120 p. 50 illus. (SpringerBriefs in Applied Sciences and Technology / PoliMI SpringerBriefs) Softcover
- approx. € (D) 53,45 | € (A) 54,95 | sFr 66,50
- approx. € 49,95 | £44.99

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**Due July 2013**

2013. 200 p. 100 illus. Hardcover
- approx. € (D) 106,95 | € (A) 109,95 | sFr 137,00
- approx. € 99,95 | £86.50

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**Due August 2013**

2014. XIII, 207 p. 69 illus., 14 in color. (Lecture Notes in Energy, Volume 15) Hardcover
- * € (D) 139,09 | € (A) 142,99 | sFr 173,50
- € 129,99 | £117.00
ISBN 978-3-319-00821-9

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F. Chen, National Taiwan University, Taipei, China

**The Kuroshio Power Plant**

By outlining a new design of the Kuroshio power plant, new approaches to turbine design, anchorage system planning, deep sea marine engineering and power plant operations and maintenance are explored and suggested.

**Features**
- Details new approaches to turbine design, anchorage system planning, deep sea marine engineering, and power plant operations and maintenance to develop a new plan for the Kuroshio power plant
- Provides a careful assessment for the environmental impact of the plant but also of natural phenomena on the plant
- Focuses on the Kuroshio plant, but discusses designs that are applicable to all plants in deep waters with strong current such as the Gulf Stream east of Florida, the East Australian Current, the Humboldt Current west of South America, and the East Africa Coastal Current

**Contents**

**Fields of interest**
- Renewable and Green Energy; Offshore Engineering; Machinery and Machine Elements

**Target groups**
- Research

**Product category**
- Monograph

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O. Craciun, Grenoble University, G2ELAB, Saint Martin D’Heres, France; S. Bacha, University Joseph Fourier of Grenoble, Saint Martin D’Heres, France

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**Target groups**
- Research

**Product category**
- Monograph

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Electromagnetic Transients in Power Cables

From the more basic concepts to the most advanced ones where long and laborious simulation models are required, Electromagnetic Transients in Power Cables provides a thorough insight into the study of electromagnetic transients and underground power cables. Explanations and demonstrations of different electromagnetic transient phenomena are provided, from simple lumped-parameter circuits to complex cable-based high voltage networks, as well as instructions on how to model the cables. Supported throughout by illustrations, circuit diagrams and simulation results, each chapter contains exercises, solutions and examples in order to develop a practical understanding of the topics.

Features
► Features thorough explanations of different cable electromagnetic transient phenomena, from the simplest lumped parameters circuits to the complex cable-based high voltage networks ► Explains and demonstrates the importance of modelling and indications on how to model a cable-based network ► Includes a large number of solved exercises which can be replicated by the reader, real life examples and real network data supplemented with online cases and examples

Contents

Fields of interest
Energy Systems; Power Electronics, Electrical Machines and Networks; Circuits and Systems

Target groups
Research

Product category
Monograph

Smart-Eco Buildings towards 2020/2030

Innovative technologies for resource efficient buildings in the next future

The book aims to provide a basis for design and construction of resource-efficient buildings. The main concepts follow the vision of a European Sustainable Building as defined in the 2-years Smart-ECO research project funded by European Commission under the Sixth Framework Program. The focus is concentrated on innovations enabling the building sector to meet the requirements originating from the sustainability concept. Innovation is considered at different scales: micro (product, service and process), meso (sector, supply chain, region and system) and macro (economy-wide).

Features
► A vision of sustainable buildings in the next future, helping researchers, students and also professionals to define a conceptual framework for their work ► Several best practices and a wide international bibliography for reference ► Information on innovative sustainable materials and advanced evaluation tools

Contents

Fields of interest
Renewable and Green Energy; Building Construction; Climate Change Management and Policy

Target groups
Research

Product category
Brief

International Bioenergy Trade

History, status & outlook on securing sustainable bioenergy supply, demand and markets

Features
► Comprehensive coverage. This book includes all biomass commodities that are traded in any significant volumes in detail ► Authors from industry & academia and from the main bioenergy exporting & importing countries on 3 continents ► First of a kind.

Contents
Chapter 1 A general introduction to international bioenergy trade; André Faaij, Martin Junginger, Chun Sheng Goh. - Chapter 2 Developments in international liquid biofuel trade; Patrick Lamers, et al. - Chapter 3 Global woody biomass trade for energy; Patrick Lamers, et al. - Chapter 4 Development of bioenergy trade in four different settings – the role of potential and policies; Daniela Thrän, et al. - Chapter 5 Optimization of Biomass Transport and Logistics; Erin Searcy, et al. - Chapter 6 The role of sustainability requirements in international bioenergy markets; Luc Pelkmans, et al. - Chapter 7 Drivers and barriers for bioenergy trade; Martin Junginger, et al. - Chapter 8 Medium and long-term perspectives of international bioenergy trade; Lukas Kranzl, et al. - Chapter 9 Financing bioenergy trade: Making it happens; Michael Deutmeyer, et al. - Chapter 10 Synthesis and recommendations; Martin Junginger, Chun Sheng Goh, André Faaij.

Fields of interest
Energy Policy, Economics and Management; Renewable and Green Energy; Environmental Economics

Target groups
Research

Product category
Contributed volume
Global Energy Policy and Security

Features
- Addresses the need for a multidisciplinary perspective on issues about global energy policy and security
- Covers issues related to finance, economics, and environmental science
- Integrates philosophical chapters and technical/modeling chapters to provide a comprehensive coverage

Contents

Fields of interest
Energy Policy, Economics and Management; Energy Economics; Environmental Science and Engineering

Target groups
Research

Product category
Monograph

Energy-Efficient Fault-Tolerant Systems

This book describes the state-of-the-art in energy efficient, fault-tolerant embedded systems. It covers the entire product lifecycle of electronic systems design, analysis and testing and includes discussion of both circuit and system-level approaches. Readers will be enabled to meet the conflicting design objectives of energy efficiency and fault-tolerance for reliability, given the up-to-date techniques presented.

Features
- Provides embedded systems designers with state-of-the-art solutions to the conflicting problems of energy efficiency and fault-tolerance for reliability

Contents

Fields of interest
Circuits and Systems; Semiconductors; Renewable and Green Energy

Target groups
Research

Product category
Monograph

Rectenna Solar Cells

Features
- Covers higher level concepts and understanding the challenges, equipment, and skills required to develop rectenna structures
- Discusses concepts applicable for light to electron conversion circuitry
- Examines thermophotovoltaics, which deals specifically with IR frequencies

Contents

Fields of interest
Energy Systems: Microwaves, RF and Optical Engineering; Optics, Optoelectronics, Plasmonics and Optical Devices

Target groups
Research

Product category
Contributed volume

Due July 2013

2013. VIII, 367 p. 104 illus., 32 in color. (Lecture Notes in Energy, Volume 16) Hardcover
- € (D) 139,09 | € (A) 142,99 | sFr 173,50
- € 129,99 | £117.00

2014. XII, 290 p. 177 illus., 49 in color. Hardcover
- € (D) 139,09 | € (A) 142,99 | sFr 173,50
- € 129,99 | £117.00

2014. VI, 363 p. 228 illus., 96 in color. Hardcover
- € (D) 139,09 | € (A) 142,99 | sFr 173,50
- € 129,99 | £117.00
ISBN 978-1-4614-3715-4
**News 6/2013**

**Uranium Processing and Properties**

Uranium Processing and Properties describes developments in uranium science, engineering and processing and covers a broad spectrum of topics and applications in which these technologies are harnessed. This book offers the most up-to-date knowledge on emerging nuclear technologies and applications while also covering new and established practices for working with uranium supplies. The book also aims to provide insights into current research and processing technology developments in order to stimulate and motivate innovation among readers.

**Features**

- Covers a broad spectrum of topics and applications that deal with uranium processing and the properties of uranium
- Offers extensive coverage of both new and established practices for dealing with uranium supplies in nuclear engineering
- Promotes the documentation of the state-of-the-art processing techniques utilized for uranium and other specialty metals

**Contents**


**Fields of interest**

Nuclear Energy; Nuclear Engineering; Machinery and Machine Elements

**Target groups**

Research

**Product category**

Monograph

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**Due July 2013**

2014. X, 405 p. 205 illus., 78 in color. Hardcover

- * (D) 139,09 | (A) 142,99 | sFr 173,50
- € 129,99 | £117.00


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**Optimization and Security Challenges in Smart Power Grids**

**Features**

- Describes the challenges concerning an issue of national security and the merging of electric grids
- Provides solutions for how to develop systems engineering techniques to solve many problems involved in implementing smart grids
- Presents the key technologies and methods needed to manage a flexible distributed energy system

**Contents**


**Fields of interest**

Energy, general; Industrial and Production Engineering; Optimization

**Target groups**

Research

**Product category**

Contributed volume

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**Due November 2013**


- * (D) 49,99 | (A) 51,39 | sFr 62,50
- € 46,72 | £42.99

ISBN 978-3-658-02003-3

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**Thermal energy storage for medium and high temperatures**

**Concepts and applications**

Principles and concepts for the technical use of thermal energy storage systems are described, for which temperatures between 373 and 1273 °K were used. The book presents criteria for classification and comparison of concepts. Innovations and actual technical applications are described. Application potentials are shown for the presented energy storage concepts from the fields power plants, electricity storage, process heat and traffic.

**Features**

- Overview different technologies for energy storage
- Thermal energy storage especially for solar thermal power plants are shown
- All actual developments are described

**Contents**

- Basics
- Thermal energy storage as option to improve energy efficiency
- Evaluation criteria
- Classification of concepts
- Fundamental storage concepts
- Sensible heat energy storage
- Latent heat energy storage
- Thermochemical energy storage
- Applications
- Power Plants
- Process Industry
- Storage of electricity
- Vehicles

**Fields of interest**

Energy Storage; Energy Policy, Economics and Management; Energy Efficiency (incl. Buildings)

**Target groups**

Professional/practitioner

**Product category**

Professional book
Piezo-Active Composites
Orientation Effects and Anisotropy Factors

The book is devoted to the problem of microgeometry properties and anisotropy relations in modern piezo-active composites.

Features

- Comprehensive presentation of orientation effects and anisotropy in piezo-active composites
- Explains the conversion of mechanical energy into electric energy
- Explains orientation effects and anisotropy of piezoelectric properties in composites and ferroelectric single crystals
- Provides smart-materials applications of piezo-active composites
- Reveals the interconnections between microgeometry, electromechanical properties and their anisotropy in composites
- Illustrated by numerous examples of maxima (minima) of effective parameters of advanced composites based on single crystals of relaxor-ferroelectric solid solutions

Contents

Fields of interest
Optical and Electronic Materials; Engineering Thermodynamics, Heat and Mass Transfer; Electronics and Microelectronics, Instrumentation

Target groups
Research

Product category
Monograph

Due July 2013

2014. 200 p. 90 illus., 50 in color. (Springer Series in Materials Science, Volume 185) Hardcover
- *€ (D) 106,99 | € (A) 109,99 | sFr 133,50
- € 99,99 | £90.00
ISBN 978-3-642-38353-3

Due June 2013

2013. 420 p. 50 illus. (Water Resources Development and Management) Hardcover
- approx. *€ (D) 139,05 | € (A) 142,94 | sFr 186,50
- approx. € 129,95 | £117.00
ISBN 978-3-642-23745-4