This insightful book examines how the utility sector is responding to growing numbers of consumers self-generating, storing and potentially trading energy.

KEY FEATURES

The electric power sector is undergoing fundamental transformation at an unprecedented pace driven by technological innovation and disruptions taking place primarily at the intersection of the distribution network and customer’s premises – at the grid’s edge. The most important drivers of change include:

- Rapid uptake of distributed energy resources (DERs), notably rooftop solar PVs and energy efficiency;
- Advances in energy storage and management that allows more active participation by consumers in how, how much, and when energy is generated, consumed, stored or possibly shared or traded; and
- Promising developments in open platforms that allow variable generation and loads to be aggregated while allowing peer-to-peer trading among participants.

This book examines the implications of DERs and the rise of prosumers on the incumbents’ business models and challenges facing regulators who must allow innovation to take place while managing a level playing field for the newcomers and existing players.

“The chapters in this book compile a wide range of expertise and perspectives to promote the sharing of knowledge, ideas and experience in how some of these challenges might be addressed. I trust you will find it an insightful read.”

Paula Conboy, Chair, Australian Energy Regulator

"The authors speaking here are providing cutting-edge thinking to help us recognize that DERs, advanced distribution management systems, price signals, market structures, and utility business models may coalesce to realize a decentralized, reliable, clean and customer driven future."

Michael Picker, President, California Public Utilities Commission

“This book is notable for addressing issues that are central to the future governance and functionality of the distribution network while encouraging technological innovation and disruption at the grid’s edge.”

Audrey Zibelman, CEO of AEMO and former Chair, New York Public Service Commission

“This volume is a timely contribution to the topic of the innovation and disruption, which is more and more dominating the discussion within the energy industry and is coming to the fore at academia.”

Johannes Mayer, Head of Competition & Regulation, E-Control Austria
Innovation and Disruption at the Grid’s Edge
How distributed energy resources are disrupting the utility business model
Fereidoon P. Sioshansi, Editor

Table of Contents

Foreword
   Paula Conboy, Chair, Australian Energy Regulator, Melbourne, Australia
Preface
   Michael Picker, President, California Public Utilities Commission
Introduction
   Audrey Zibelman, CEO of AEMO and former Chair, New York Public Service Commission

Part I: Envisioning alternative futures
1. Innovation & disruption at the “grid’s edge”
   Fereidoon Sioshansi, Menlo Energy Economics
2. Innovation, disruption and the survival of the fittest
   Stephen Woodhouse and Simon Bradbury, Pöyry
3. The great rebalancing act: Rattling the electricity value chain from behind the meter
   Robert Smith, East Economics and Iain MacGill, UNSW
4. Beyond community solar: Aggregating local distributed resources for resilience and sustainability
   Kevin Jones, Erin Bennet, Flora Wenhui Ji and Borna Kazerooni, Vermont Law School
5. Grid vs. distributed solar: What does Australia’s experience say about the competitiveness of distributed energy?
   Bruce Mountain, CME Australia and Russell Harris, Wollemi Consulting
6. Powering the driverless electric car of the future
   Jeremy Webb and Clevo Wilson, QUT, Brisbane, Australia
7. Regulations, barriers and opportunities to the growth of DERs in the Spanish power sector
   Eloy Alvarez Pelegry, Orkestra-Deusto University
8. Quintessential innovation for transformation of the power sector
   John Cooper, Prsenl

Part II. Enabling future innovations
9. Bringing DERs into the mainstream: Regulations, innovation and disruption at the grid’s edge
   Jim Baak, Vote Solar
10. Public policy issues associated with feed-in-tariffs and net metering:
   An Australian perspective
    Darryl Biggar, Australian Competition & Consumer Commission (ACCC) and
    Joe Dimasi, Independent Competition & Regulatory Commission (ICRC) and Monash Business School
11. We don’t need a new business model: “It ain’t broke and it don’t need fixin”
    Clark Gellings
12. Towards dynamic network tariffs: A proposal for Spain
    Sergio Haro, Vanessa Aragonés, Manuel Martínez, Eduardo Moreda, Andrés Morata, Estefanía Arbós, and Julián Barquín, Endesa
13. Internet of Things and the economics of microgrids
    Günter Knieps, Univ. of Freiburg

Part III. Alternative business models
14. Access rights and consumer protection in a distributed energy system
    Fiona Orton, Tim Nelson, Tony Chappel and Michael Pierce, AGL, Australia
15. The transformation of the German electricity sector and the emergence of new business models in distributed energy systems
    Sabine Löbbe and André Hackbarth, Reutlingen University
16. Peer-to-peer energy matching: Transparency, choice and locational grid pricing
    James Johnston, Open Utility
17. Virtual power plants: Bringing the flexibility of decentralized loads and generation to power markets
    Helen Steiniger, Next Kraftwerke
18. Integrated community-based energy systems: Aligning technology, incentives and regulations
    Binod Koirala and Rudi Hakvoort, TU Delft, the Netherlands
19. Solar grid parity and its impact on the grid
    Jeremy Webb, Clevo Wilson and Theodore Steinberg, QUT, Brisbane, Australia and Wes Stein, CSIRO

Epilogue
   Johannes Mayer, e-Control, Austria