



Book Title: **Active Building Energy Systems: Operation and Control**

This book introduces an overview of the concept, technologies, control strategies, operation and market participation, and optimization of Active Buildings (ABs) while covering a comprehensive and in-depth review of building-level energy system technologies and different control, operation and market mechanisms. Potential topics include but are not limited to:

➤ **Introduction/Overview**

- ✚ An overview of the Active Buildings (AB): concepts, definition, classifications, and technologies
- ✚ Building-level distributed energy resources including PVs, energy storage (hydrogen, electricity, heat/cool), etc.
- ✚ Building physics-based modelling of ABs
- ✚ Energy-based performance assessment of ABs
- ✚ Zero energy and net-zero energy buildings
- ✚ Passive behaviour improvement of traditional buildings (building retrofitting)
- ✚ Thermal and electrical energy storage devices for ABs
- ✚ Lessons learnt from AB projects around the world

➤ **Control of ABs**

- ✚ Isolated control of ABs
- ✚ Coordinated control of ABs at district/city level
- ✚ Application of model predictive control in ABs
- ✚ Monitoring of ABs
- ✚ IoT-based AB control
- ✚ Distributed control of the network of ABs

➤ **Operation of ABs**

- ✚ Energy management systems of grid-connected ABs
- ✚ Energy management systems of isolated ABs
- ✚ AC, DC or Hybrid model of ABs
- ✚ AB as an electricity network service provider
- ✚ Resilience-based operation of ABs
- ✚ Reliability-based modelling of ABs
- ✚ Uncertainty aware energy management of ABs
- ✚ Artificial intelligence for the operation of ABs

➤ **Market participation of ABs**

- ✚ Building-to-Building (B2B) energy transactions
- ✚ Building-to-Grid (B2G) energy transactions
- ✚ Building-to-Vehicle (B2V) energy transactions
- ✚ Participation of AB as a prosumer in energy markets
- ✚ Participation of AB in a peer-to-peer (P2P) energy trading and local transactive markets
- ✚ Vehicle-to-Building (V2B) energy transactions

Important Dates:

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