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storage (TES) systems 4.1 Introduction; 4.2 Principles of heat storage in solid media; 4.3 State-of-the-art regenerator-type storage; 4.4 Advances in the use of solid storage media for heat storage; References; 5 The use of aquifers as thermal energy storage (TES) systems; 5.1 Introduction; 5.2 Thermal sources; 5.3 Aquifer thermal energy storage (ATES); 5.4 Thermal and geophysical aspects; 5.5 ATES design; 5.6 ATES cooling only case study: Richard Stockton College of New Jersey
5.7 ATES district heating and cooling with heat pumps case study: Eindhoven University of Technology5.8 ATES heating and cooling with de-icing case study: ATES plant at Stockholm Arlanda Airport; 5.9 Conclusion; Acknowledgements; Bibliography; 6 The use of borehole thermal energy storage (BTES) systems; 6.1 Introduction; 6.2 System integration of borehole thermal energy storage (BTES); 6.3 Investigation and design of BTES construction sites; 6.4 Construction of borehole heat exchangers (BHEs) and BTES; 6.5 Examples of BTES; 6.6 Conclusion and future trends; References
7 Analysis, modeling and simulation of underground thermalenergy storage (UTES) systems7.1 Introduction; 7.2 Aquifer thermal energy storage (ATES) system; 7.3 Borehole thermal energy storage (BTES) system; 7.4 FEFLOW as a tool for simulating underground thermal energy storage (UTES); 7.5 Applications; References; Appendix: Nomenclature; Part Two Latent heat storage systems; 8 Using ice and snow in thermal energy storage systems; 8.1 Introduction; 8.2 Principles of thermal energy storage systems using snow and ice; 8.3 Design and implementation of thermal energy storage using snow
8.4 Full-scale applications

Sommario/riassunto

Thermal energy storage (TES) technologies store thermal energy (both heat and cold) for later use as required, rather than at the time of production. They are therefore important counterparts to various intermittent renewable energy generation methods and also provide a way of valorising waste process heat and reducing the energy demand of buildings. This book provides an authoritative overview of this key area. Part one reviews sensible heat storage technologies. Part two covers latent and thermochemical heat storage respectively. The final section addresses applications in heating and energy