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The most popular renewable energy sources are wind and sun; biomass and flowing water are usually also subsumed in this category. The latter receive less attention when discussing widely varying supply and associated challenges. Only in extreme weather and season situations, their supply might be limited: In very hot summers with long dry periods, the growth of plants used in biomass-fueled installation may be a problem, and low water levels may limit power generation in power plants in rivers. Fluctuations on wide time scales are the rule with sun and wind. This applies to some other energy sources, too. They are less popular but also important enough to merit researchers attention. The present book provides a timely collection of chapters dedicated to them, in particular to vibration energy and thermal energy. Photovoltaic and wind energy harvesting are treated also. Even the term “energy harvesting,” which may sound somewhat strange to some electrochemists, becomes rather natural, almost familiar, to the reader after finishing this book.

Starting with an overview, the reader is made familiar with those forms of energy available for harvesting: vibrational, thermal, light, and wind. Terminology is a bit confusing and non-systematic. Photovoltaic is presumably not a form of energy but a mode of conversion, and even wind is only a typical feature of daily weather and no form of energy. Accepting these minor imprecisions in daily discussion is hard to avoid; in the present text, it does not result in confusion. At the end of chapter 1, an extensive section is dedicated to electric energy conversion and storage. The wide fluctuations of supply are a characteristic of all these forms of energy, and consequently electric means of converting the supply into a stream of electric current compatible with the demand of a device as well as storing excess energy for demand in times of no supply are of

major importance. The latter is good news for the electrochemist dealing in batteries and supercapacitors. This section gives a short overview, just enough to demonstrate the major importance of electrochemical energy storage and conversion.

The following chapters are treating the various means of harvesting mechanical, thermal, solar, and wind energy. Converters of mechanical into electric energy based on inductive, piezoelectric, and magnetostrictive principles are handled in separate chapters. Thermoelectric converters (for both modes of operation heat into electric energy and vice versa) are discussed in great detail; the same applies to photovoltaics in chapter 6. The chapter on wind energy conversion seems to be a bit short, but major parts have been covered in the somewhat unbalanced introductory chapter already. In the final chapter, further options including shape memory alloy heat engines, thermomagnetic, and electrostatic harvesting are briefly introduced.

The book is amply illustrated. Unfortunately the authors failed to curb their enthusiasm when incorporating figures which became simply illegible after size reduction (Fig. 1.7 should illustrate the stupendous progress in solar cell efficiency, size reduction left a study in gray) or remain somewhat mysterious: Fig. 1.5f seems to show a rather ordinary wrist watch. It should serve as an illustration of a thermal energy converter. The reader has to believe that. In Fig. 5.1, the illustration of the Seebeck effect contains a perfect short circuit; the inserted voltmeter will never record an output voltage. In Fig. 6.5, electrons and holes created by dissociation of an exciton are somehow messed up. Some of these flaws are minor, almost entertaining. Some are disturbing.

The book is a helpful source for any reader interested in more details of the use of renewable energies large and small. The electrochemist will benefit from a better knowledge of those devices feeding his batteries and supercaps. All will learn more about energy sources and their utilization beyond the carbon and nuclear age.

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