

## Chapter 7

# Conclusions and Future Prospects



RED is a promising method for capturing SGE in river estuaries without any moving parts. This book summarizes recent advancements in RED technology. For the successful application of RED, stack components and system design need to be enhanced for higher power density and lower cost. As commercial IEMs are not appropriate for RED systems, various tailored IEMs with high permselectivity and low resistance have been demonstrated at the lab-scale. In addition, nanochannels have emerged as an alternative approach; however, mass production of nanochannel membranes, which is required for their practical use, has not begun. In a flow channel, it is important to achieve uniform flow distribution, eliminate shadow effects, and lower the pressure drop. The profiled membranes have these properties. It is also crucial to determine the optimal operating conditions and develop maintenance technology to deal with fouling. The applications of RED are expanding as the power density of the technology improves, for example, brine recovery for desalination processes and waste heat recovery from industrial fields. However, despite recent achievements, full-scale RED plants are not yet available. Additional pilot-scale studies are required to validate the feasibility of RED.