in Asia and one-third of this 5% from South America. If this is the outcome of a conscious attempt at inclusion, then it says much about the inherent prejudices and imbalances in the field itself. While other disciplines can escape this criticism by hiding behind disciplinary protocols, for this to happen in a field like STS should be seen as a monumental failure.

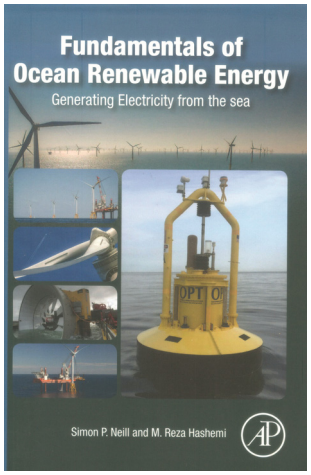
This is a tragedy given that in terms of active scientists as well as the number of consumers of S&T, India and China far outweigh the rest of the world, particularly the small sample of Western countries which see themselves as the sole custodians of this field. In terms of technological leadership in the commercial domain, like in information technology, Indians and Chinese have become influential leaders. Yet the STS community seems to believe that the deliberations by a few – and among the few – are enough to capture the complexity of this global process. If we do a sociological analysis of the authors, their institutional affiliations and connections to the other authors (as students, colleagues, etc.), would it illustrate one more instance of academic cronyism? The extensive references in each of these chapters, which are all oblivious to the need to draw upon the literature in other parts of the world, perpetuate this myth that STS does not – and cannot? – have meaningful contributions from the rest of the world. So why should the rest of the world bother to engage with such books?

I mention this because to read this book one has to first overcome this myopic vision of STS itself. So how are we to read this book in order to understand how science functions in India? How our scientific institutions do what they do, how science in the public domain is able to continue its rhetoric, how it speaks to the kind of science that is being done in our laboratories, or the ways in which this science is being done here?

In continuing this hegemonic, and self-indulgent, presentation of the field, the book ends up duplicating the same problematic structures of science itself. Given that STS as a discipline has the capacity for self-reflection, unlike science, it is all the more unpardonable to continue to produce such texts without being aware of the exclusive and hegemonic politics behind it. But we should also realize that such brazen rejection of worldviews and practices from the global South is possible only because we, within India, do not develop any critical, autonomous tradition based on our ideas and experiences. The point in reading such books is not to reject them – for there is much to learn from them – but to use them once more as a mirror to see where we have gone wrong and how we do not learn anything from our mistakes.

SUNDAR SARUKKAI

*National Institute of Advanced Studies, Indian Institute of Science Campus, Bengaluru 560 012, India*
*e-mail: sarukkai@nias.res.in*




**Fundamentals of Ocean Renewable Energy: Generating Electricity from the Sea.** Simon P. Neill and M. Reza Hashemi. Academic Press, An Imprint of Elsevier, 125 London Wall, London EC2Y 5AS, UK. 2018. xv + 319 pages. Price: US$ 149.00.

The world population is growing rapidly and this puts a large demand on energy, resulting in depletion of natural resources. Due to the increase in population, economic expansion and increase in transportation, the global demand for energy consumption has increased in the last 50 years. Hence, man is looking for renewable energy for his survival. The main sources used globally to generate electricity in the year 2014 were coal (41%), natural gas (22%), hydropower (18%) and nuclear (11%). Currently, renewable energy sources like wind, solar and biomass contribute only ~5% of the energy. Seventy-one per cent of the earth's surface is covered by ocean and most of the sun's energy is transferred to the ocean through heat and wind. The sun and moon cause tides and tidal currents in the ocean. Hence, ocean is a vast source of renewable energy. This book covers the most significant progress in almost all the renewable energy sources from the ocean, i.e. wave, tide, current, ocean thermal energy conversion and salinity gradients along with the offshore wind. It is a single source for vast information related to ocean renewable energy, including fundamental physics and the theory behind ocean energy systems from both oceanographic and engineering perspectives.

This book can be used for teaching courses dealing with marine renewable energy in both marine science and engineering disciplines. It can also serve as a reference book for scientists and engineers working in academia/industry in the marine renewable energy field. The authors have vast experience, both academic and industrial, in the fields of fluid dynamics, coastal engineering and renewable energy, and hence have been able to include various topics in a logical sequence. The subject is covered in 10 chapters starting with the importance of renewable energy followed by basic hydrodynamics and the focus on different sources of energy from the ocean, including its resource assessment and most widely adopted conversion technologies.

The introduction to the subject in the first chapter highlights the impact of climate change and the need to go for renewable energy along with the basic concepts of energy and power. The most predictable ocean energy, i.e. tidal energy is covered in chapter 3. The generation of tides, their propagation, prediction of tides and the fundamentals of tidal energy are all discussed sequentially. Offshore wind energy, one of the fastest growing renewable energy sectors is discussed in chapter 4. The crucial step in identifying the location for a wind energy devices is resource assessment, which is discussed in detail in the book along with technical aspects of offshore wind energy. Marine spatial planning of an offshore wind farm is a complicated process involving technical, economic, ecological, societal and legal aspects, and the book briefly covers all of them. High energy density is contained in ocean waves and hence they have the potential to become an economically viable renewable energy source. The various wave energy converter technologies are introduced in chapter 5

along with wave energy resource assessment and the fundamentals of waves based on linear wave theory and the relations between various wave parameters.

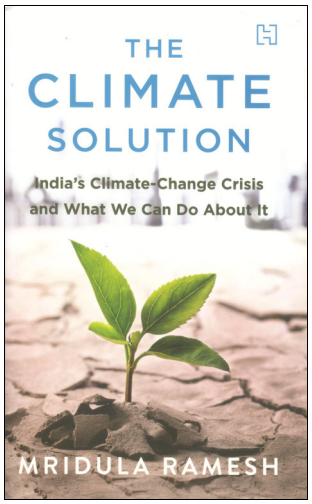
The energy from currents, salinity gradient and ocean thermal energy conversion is discussed in chapter 6 along with technology types and environmental impacts. Commercial progress in various ocean energy plants is also discussed. Ocean energy resource assessment is a significant challenge faced by wave energy plant developers. The book covers in detail the various methods of wave and tidal energy resource assessment along with the details of instruments used to obtain *in situ* data and information through satellite and airborne remote-sensing technologies, including X-band and high-frequency radar. Although tools for observing the oceans have recently been revolutionized due to technological developments, such as remote sensing by sensors carried by satellites and *in situ* measurements using autonomous vehicles and instrumented moorings, the role of research vessel still continues to be most important in ocean sciences. The different measurements from the research vessel are also covered in the book.

Direct observations from buoys remain the most reliable sources data, but *in situ* measurements are costly, time-consuming and difficult to cover the entire oceans. Ocean modelling is a commonly used tool which is also economical and plays a vital role in the generation of oceanographic data and resource assessment. Accordingly, chapter 8 is exclusively devoted to ocean modelling for resource characterization. General features of ocean models, numerical methods, input parameters, boundary conditions along with the tools for model preprocessing and post-processing are discussed in detail. For minimizing the environmental impacts and maximizing electricity generation, optimization needs to be done. Chapter 9 introduces the optimization theory, intra-array and inter-array optimization, and the various optimization tools. Resource variability influences electricity generation, and how the resources vary intra-annually, inter-annually and due to climate change is also discussed in the book.

Technology readiness level used to estimate technology maturity should have been provided in the book for all the major technologies developed for extracting electricity from the ocean. A number of ocean energy converters have been developed since the 1940s and a few of them have been commercially demonstrated in actual sea conditions. More than 200 wave energy converters were under development in 2017, with varying degrees of maturity. Even though several concepts have been tested, due to the harsh ocean environment, at present some of the concepts are not commercially viable and some of them have failed. It would have been better had the authors introduced another chapter on lessons learned from the development of various ocean energy converters.

V. SANIL KUMAR

*Ocean Engineering Division,*
*CSIR-National Institute of Oceanography,*
*Dona Paula,*
*Goa 403 004, India*
*e-mail: sanil@nio.org*




**The Climate Solution: India's Climate-Change Crisis and What We Can Do About It.** Mridula Ramesh, Hachette Book Publishing India Pvt Ltd, 4th/5th Floors, Corporate Centre, Sector 44, Gurugram 122 003. 2018. x + 325 pages. Price: Rs 550.

During the past 20 years, many books have been written that deal with global warming or on its impact on society. Most of these books are by foreign authors from developed countries – mainly journalists or scientists. Some of these books try to convince the reader that climate change is a natural phenomenon and that the society can learn to adapt to it. The books written by scientists tend to convince the reader that human beings are responsible for the rapid warming of the earth during the past 50 years. The books written by journalists tend to focus on the politics surrounding the attribution of climate change to human actions. Most of these books do not discuss, in great detail, what we can do to arrest global warming.

There are very few books written by authors from India that discuss the challenges faced by Indians in dealing with climate change. Hence this book is unusual since its major focus is on India and is written by an Indian author (founder of Sundaram Climate Institute, Madurai, Tamil Nadu). The book will benefit those who want to know about climate change and what they can do about it. The author begins by stating that 'we are playing Russian roulette with our collective future'. The first part of the book explains climate and environmental changes in eight chapters, while the second part discusses what we can do to deal with them in 11 chapters. The first chapter highlights the fact that although India contributes about 6% to global emission of carbon dioxide, the adverse impact of global warming on the country will be much higher than on developed countries. At this point the author expresses her concern about climate change and environmental change together, and this can confuse the reader. Most of the environmental change in India is not on account of global warming. The author mentions that the global vertebrate population has halved in the past 40 years, but this is not directly related to the increase in carbon dioxide in the atmosphere but more directly related to the rapid increase in human population. The author highlights that the rate of global warming in the 20th century is unprecedented. During the past 100 years the global mean temperature has increased by 1°C, while when we came out of the Last Ice Age 15,000 years ago, the global mean temperature increased by 1°C in 1000 years. In the second chapter the author has highlighted the challenge all nations will face if they want to limit global warming to within 1.5–2°C above the value in 1850. In the third chapter the