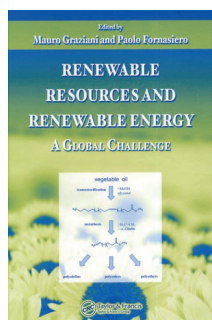




Renewable Resources and Renewable Energy



A Global Challenge. Edited by **Mauro Graziani** and **Paolo Fornasiero**. CRC Press/Taylor & Francis, Boca Raton 2007. 368 pp., hardcover £ 74.99.—ISBN 0-8493-9689-1

In the opening chapter of this book the author, Ramani Narayan, explains rightly that: “*Discussions on sustainability and environmental responsibility center on the issue of managing carbon-based materials in a sustainable manner, as part of the natural carbon cycle*”. Recently, Cuba’s president protested against the use of land for growing sugar cane for the production of bio-ethanol. It is true that 93% of the world’s annual biomass production is unused, and so is the enormous amount of waste from the agrofood industry that might easily be used as feedstock for the production of plastics (Chapter 6).

The book originates from a conference held in Italy in 2004 under the auspices of the UN Center for Science and High Technology. However, its title is too ambitious, as the book’s 16 chapters do not address the scientific aspects of renewable energy sources, but instead deal mainly with conversion of renewable resources into valued-added products, and the generation of hydrogen as an energy carrier.

As the world’s population is rapidly learning, climate change due to human activities is not merely an opinion—it is

a reality that in America has already hit entire cities (New Orleans), and in southern Europe has recently hurt people and the whole ecosystem with temperatures close to 50°C in mid-June. We need to curb CO₂ emissions soon; thus, we need to switch to renewable materials and renewable energy on a massive scale. In this sense, despite its limitations, this book is a timely teaching and research resource.

In general, however, the book would have been considerably improved, in both form and content, by more careful editing. For example, Chapter 4 discusses the production of 5-hydroxymethylfurfural and levulinic acid from sucrose in five pages, whereas Chapter 5, in 55 pages, details even the “respirometric” tests carried out on biopolymers. As another example, Dr. Narayan refers us to a standard for quantifying biologically based carbon content, but the code for it that is given in the related Figure caption is wrong (Figure 1.4).

I recommend reading Chapter 12 on molten carbonate fuel cells, including the generator that supplies heat and electricity at Magdeburg’s university hospital in Germany and achieves 70% efficiency. This account shows neatly how, in Europe, we could make far better use of the valuable methane imported from Russia and Africa, instead of simply burning it. Eventually, this technology will make it possible to supply power to hospitals, public buildings, schools, factories, and houses with high efficiency.

The last chapter, which describes the effective marketing of photovoltaic technologies in developing countries, is especially interesting. We learn that in the state of Punjab (India), the solar-powered water-pumping program for farmers, which at first relied heavily on state subsidies, has been able to establish a market for photovoltaic devices where there was none before. The key to success was the setting-up of an ESCO (energy service company) to provide an integrated energy service. In return for a periodic payment from users, it installed a solar-powered pump and trained users in its operation and maintenance. As a result, 98% of the installed power was in place after one year, and farmers switched to efficient crop irrigation,

growing high-value plantation crops instead of marginal field crops.

An estimated 1.64 billion people worldwide, mainly in developing countries, are not connected to an electricity supply grid. As this will barely change in coming years, programs of the kind described above can be seen to be very relevant for social welfare and development. They are closely related to the similarly important “One Laptop per Child” program currently led by Nicholas Negroponte.

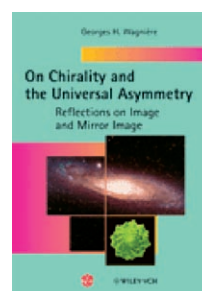
In conclusion, it is worth pointing out that the major risk that confronts this and related scientific books—that of rapid obsolescence—might have been avoided by using the Internet. If, instead of producing this book, the publishers had posted the authors’ contributions on-line one month after the 2004 conference, and printed only a general summary of the book’s contents, they would have given their subscribers exclusively up-to-date information. Authors would update their chapters at intervals of, say, 18 months, and readers would benefit from using a truly “living”—and continuously useful—book.

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On Chirality and the Universal Asymmetry



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Thousands of scientists worldwide regularly embrace the magical words chiral, chirality, and asymmetry in research projects, paper titles, and grant applications. Hardly a day passes without