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**Solar Electricity.** Tomas Markvart (ed). UNESCO Energy Engineering Learning Package (Vol. 1). John Wiley, Chichester. 1994. 1st Edition (xix + 228 pages). Price not mentioned.

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There has been a keenly felt need for quite some time for a textbook on Solar PV Electricity suitable for advanced undergraduate students doing a course on Solar Energy Utilization. Available books so far were either advanced texts and monographs, manuals for technicians or descriptive books for policy makers and general public. The book under review fills this gap and is thus very timely. Markvart, the editor, the galaxy of contributing authors and UNESCO have to be congratulated for bringing out this beautifully produced and properly sized textbook. Let us hope it will be suitably priced to enable students to own a copy individually.

Selection of topics and the level of treatment are just right for covering this fast growing field comprehensively for an introductory course. Being the product of team work, readability has occasionally suffered but it has been amply compensated by the breadth of content and

detailed insights. There is reasonable balance between scientific, engineering, industrial and end use aspects. Inclusion of life cycle costing, upcoming option of solar PV linked hydrogen systems and a full chapter on environmental implications make this book uniquely upto date. It is also suitable for a much wider readership such as professional energy engineering courses, in service training programme and for self-learning in view of the material covered.

From a strictly pedagogic point of view, the reviewer feels that chapter summaries are too brief to be useful and could well be omitted. Answers to very useful self-assessment questions could also be located for all chapters at the end of the book. Contents wise, clarity could be improved by considering the following points:

Relationship of  $p-n$  junction potential barrier to bias (Figs. 3.5) and relevance of bias to an illuminated solar cell need to be explained in greater detail, as they are basic to understanding.

In sizing procedures, storage sizing (Fig. 4.20) needs more explanation whereas sizing and reliability flow sheet (Fig. 4.21) is hardly relevant for an introductory stage.

In applications (Sec. 5.4.3, page 141),

conceptual clarity and units are masked if hydraulic energy is divided by average daily solar radiation ( $\text{kwh/m}^2 \text{ day}$ ) rather than hours of peak radiation, even though they are numerically equal.

It is hoped that there will be considerable feedback to the editor from actual users of the book world wide to enable finer tuning of the material to its textbook objectives in its subsequent editions.

The book has a comprehensive list of contents and an exhaustive index. It is also singularly free from printing mistakes (the reviewer noted only two: page 16, equation 2.7 should have G and not D; page 28 line 3 should have contrast and not contract). Line diagrams are clear and complete and boxed flow sheets are really very helpful for understanding. The book, as it stands, is quite an achievement and is bound to go into many editions and translations for use all over the world.

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