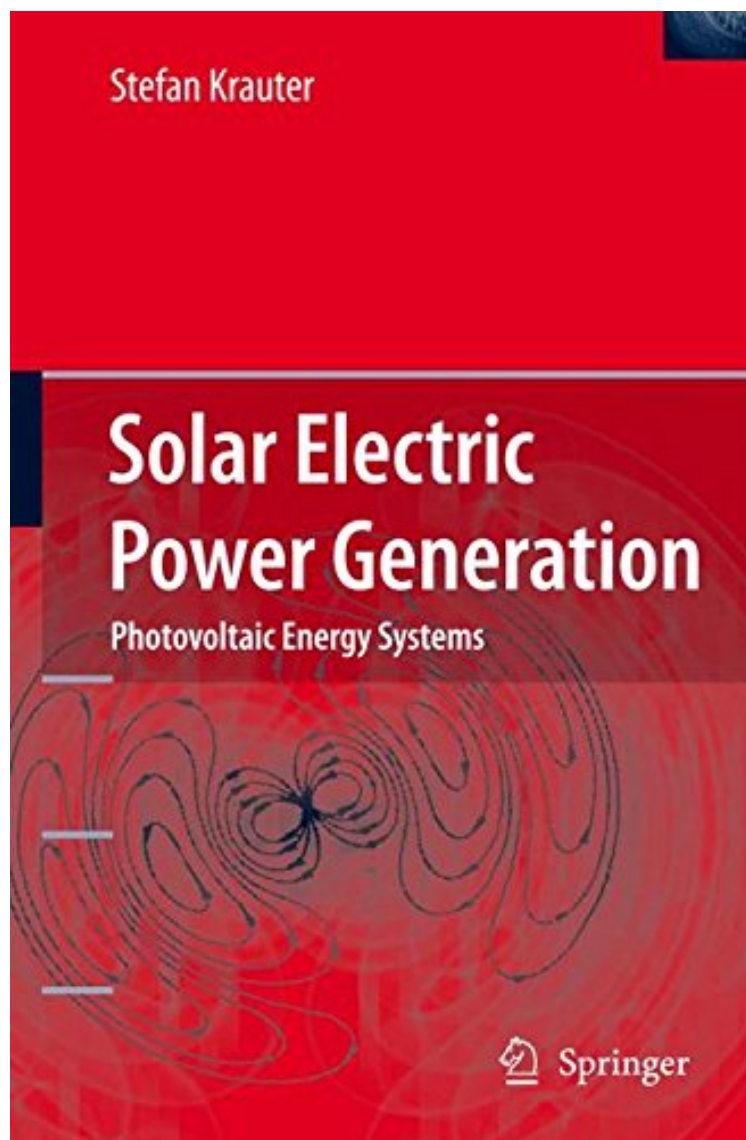


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Solar Electric Power Generation - Photovoltaic Energy Systems: Modeling of Optical and Thermal Performance, Electrical Yield, Energy Balance, Effect on Reduction of Greenhouse Gas Emissions

Stefan C.W. Krauter

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By Servulo Barros
This book explores the real potential of solar electric power generation in order to reduce CO₂ emissions and prevent the planet from global warming. For this purpose the author analyses the entire energy balance of photovoltaic power plants during their life time from the production to the recycling - taking into account the whole system. He considers all optical interfaces and layers passed by the sunlight from the sun into the solar cell, thermal layout of any photovoltaic module and its heat transfer mechanisms, its related actual electrical properties, allowing an accurate calculation of yield and an optimization of system components, thus reducing costs for solar electricity. Different locations for production and installation of photovoltaic systems are also considered. The concluding message is: If applied in an intelligent way, global energy supply via photo-electric power generation is widely possible.
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By Werner Christof
Finally someone wrote a book that also treats the interface from the solar cell to the operating conditions in a real environment. Very nice are also the LCAs (including energy (and CO₂) payback via recycling) for different sites of application.

This book thoroughly examines the technical parameters of photovoltaic systems, and appraises their net energy balance from production, operation and maintenance, to recycling. Similar performance and yield analysis is applied to optical, thermal, and electrical parameters and interfaces. Professor Krauter demonstrates how accurate yield calculations, optimal system performance, and new prototypes aid in cost reduction. Examples, tables and figures are included.

From the Back Cover
Solar electricity is an economically viable, environmentally sustainable alternative to the world's energy supplies. In support, Dr. Krauter thoroughly examines the various technical parameters of photovoltaic systems. Study of performance and yield (including optical, thermal, and electrical parameters and interfaces) are analyzed. The net energy balance of photovoltaic systems from production, operation and maintenance, to recycling is explored. Professor Krauter demonstrates how the importance of accurate yield calculations, optimal system performance, and new prototypes aid in cost reductions. The potential of solar electric power generation as a means to significantly reduce CO₂ emissions is also detailed. In addition, various locations for the production and installation of photovoltaic power plants are considered with surprising results. Examples, tables and figures are included.
About the Author
1963: Born in Goeppingen, Germany. 1988: Master in Electrical Engineering and Cybernetics at University of Technology Munich, Germany. 1992: Co-Founder of the International Solar Center Berlin. 1993: Ph.D. (Operation model of PV modules) at Prof. Rolf Hanitsch, University of Technology Berlin, Faculty of Electrical Engineering, Germany 1994: Post-doc studies at Prof. Martin Green the University of New South Wales. 1995: Visiting professor at the Federal University of Rio de Janeiro, Brazil 1996: Winner of Berlin Solar price 1997: Co-founder of the Solon AG, joint-stock company for PV module production, Berlin 2002: Organizer and general chairman of RIO 02 World Climate Energy Event (continuation of that event in 2003, 2005 and 2006, since 2003 together with Latin America Renewable Energy Fair - LAREF) Chairman at the World Council for Renewable Energies (WCRE) - Latin America Section 2003: Visiting Professor at the State University of Cear, Brazil. 2004: Member of the Board of Directors of the International Solar Energy Society (ISES) 2005 Professor at University of Technology Berlin