Index

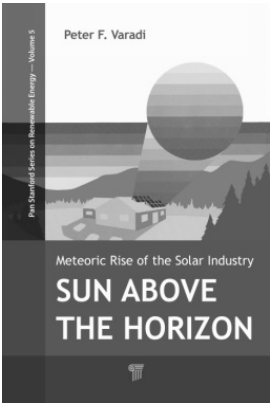
Pan Stanford Series on Renewable Energy – Volume 5

Sun above the Horizon

Meteoric Rise of the Solar Industry

Peter F. Varadi

9789814463805 (Hardcover), 9789814613293 (Paperback), 9789814463812 (eBook)
2014



The meteoric rise of the photovoltaic (PV) industry is an incredible story. In 2013, Google's investments in PV systems totaled about half a billion dollars, and Warren Buffet, one of the famous investors, invested US$2.5 billion in the world's largest PV system in California. These gigantic investments by major financial players were made only 40 years after the first two terrestrial PV companies, Solarex and Solar Power Corporation, were formed in the USA. Today, the worldwide capacity of operating PV electric generators equals the capacity of about 25 nuclear power plants. The PV industry is growing at an annual rate of 30%, equivalent to about five new nuclear power plants per year. This book describes how this happened and what lies ahead for PV power generation.

Sun above the Horizon is a must-read, as can be seen from the following citations:

In ***The Wall Street Journal***'s August 22–23, 2015, issue, Daniel Yergin writes in his review titled "Power Up": "Solar is growing fantastically," says Dr. Varadi, who chronicles solar's rise in his new book, ***Sun above the Horizon***. "Something like this requires time. Shale oil and shale gas had a ready market. When we started, we had no market at all, zero. And the industry had to get to mass production to bring down cost."

Deloitte, the multinational professional services firm, announced their book selection for 2016: "Our featured book is ***Sun above the Horizon: Meteoric Rise of the Solar Industry***, 44th book of the Books with Branko program."

"Peter takes you on a fantastic ride through the incredible growth story of modern solar energy from 1973 to the present day."

Frank Wouters
Former Deputy Director-General, International Renewable Energy Agency

"Dr. Varadi's book is a unique contribution to the history of solar PV, an energy technology that is transforming the way we generate and use electricity. I am unaware of any other book that addresses this history as comprehensively as this book does."

Dr. Allan R. Hoffman
Former Associate and Acting Deputy Assistant Secretary for Utility Technologies,
U.S. Department of Energy

"This book provides a unique perspective by one of the pioneers in the PV industry who co-founded the first company that manufactured solar cells for terrestrial applications."

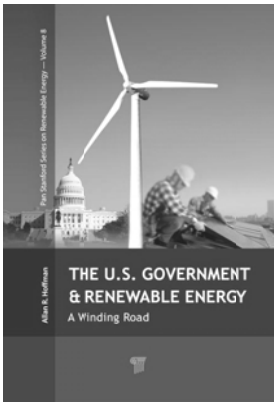
Dr. Denis J. Curtin
Former Chief Operating Officer, XTAR LLC, USA

Pan Stanford Series on Renewable Energy – Volume 7

The U.S. Government and Renewable Energy
A Winding Road

Allan R. Hoffman

9789814745840 (Paperback), 9789814745857 (eBook)
2016



This is a book on how the U.S. and other governments have changed their thinking about energy issues over the past four decades, a change triggered by increasing concern about the role of fossil fuels in global warming and climate change, greater awareness of the risks of nuclear power, and the emergence of viable renewable energy sources. It will enhance understanding of the global energy transition that is finally getting under way in the second decade of the 21st century at an accelerating, even dizzying, pace. Target audiences are the young people who will inherit the transition and shape its future, those in government who currently shape our public policies, and those colleagues, friends, and family members who lived through many of the times and events discussed in the book.

"*Hoffman played a substantial role in the development of a wide variety of renewable energy technologies over the past 40 years, while employed at the U.S. Senate, the National Academy of Sciences, and the DOE. Much can be learned by examining the failures as well as the successes. Hoffman tells us what needs to be done for a gentle landing on sustainable technologies with a smart grid. This is an important and necessary path for the nation and the planet.*"

Emeritus Professor David Hafemeister
California Polytechnic State University, USA, and Author of *Physics of Societal Issues*

"*I always had great admiration for those in government who were able to establish programs for the advancement of renewable energy (RE). This is especially true for people in the U.S. government (USG), which was highly influenced by the fossil fuel and nuclear energy industries. Allan R. Hoffman was one of these USG officials who led this effort for many years. He now presents us with this interesting and informative book that describes how RE programs were first formulated and then traveled through a winding road in the USG.*"

Dr. Peter F. Varadi
Co-founder of Solarex Corporation

"*Dr. Allan Hoffman presents a unique personal record of the U.S. energy policy development during four decades. He is one of the top driving forces in this progress and conveys a fascinating description of the successes and disappointments from the inside of the federal government. Earlier than most people, he recognized the potential of renewable energy. He has also been a pioneer in comprehending the water–energy linkage. For anybody who wishes to understand how technology relates to politics, this book is a must-read.*"

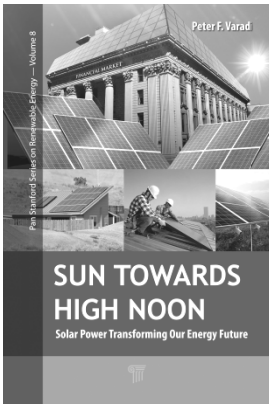
Prof. Gustaf Olsson
Lund University, Sweden

Pan Stanford Series on Renewable Energy – Volume 8

Sun towards High Noon
Solar Power Transforming Our Energy Future

Peter F. Varadi

9789814774178 (Paperback), 9781315196572 (eBook)
2017



The meteoric expansion of the solar (PV) industry resulted from an incredible reduction in the prices of PV systems—first described in the author's earlier book **Sun above the Horizon**. This book describes how the worldwide PV operational power capacity grew to some 300 GW by the end of 2016. Most of this increased capacity, 250 GW, was installed during the years 2010–2016. Suddenly PV started to affect the traditional generation of electricity. Three practically unlimited new PV markets—residential, commercial, and utility scale—materialized, along with the new PV-oriented financial systems needed to provide the required gargantuan-scale capital. This book also highlights the increasing demand for and the corresponding increased supply of PV cells and modules on four continents and the impact of this PV breakthrough on our lives and future. To present this unparalleled story, the author was helped by the contributions of top experts Wolfgang Palz, Michael Eckhart, Allan Hoffman, Paula Mints, Bill Rever, and John Wohlgemuth.

"*This comprehensive and timely book provides the reader with a very thorough technical, regulatory, and financial overview of the global solar (PV) industry. Featuring internationally eminent contributors from the who's who of solar industry experts, this book offers insights, analysis, and background on all the key issues facing this rapidly growing industry. It will be an invaluable reference and resource for scholars, investors, and policymakers dealing with the emerging solar power phenomenon.*"

Branko Terzic
Atlantic Council and Former Commissioner, U.S. Federal Energy Regulatory Commission

"*The long-term welfare of people on our planet depends on an energy system heavily dependent on solar energy. This solar energy handbook presents a well-documented, comprehensive, and insightful view of solar energy's past, present, and future. Its preeminent contributing authors include solar energy pioneers, visionaries, and practitioners who bring a wealth of experience and insights into solar energy markets, financing, policy, and technology.*"

Karl R. Rábago
Executive Director, Pace Energy and Climate Center,
Elisabeth Haub School of Law,
Pace University, USA

Both Africa and the Middle East are blessed with enormous solar energy resources. Electrification is an urgent need in Africa, where many of its 54 countries are among the world's fastest-growing economies, but where half the population still has no access to electricity. Solar energy is seen as the fastest and cheapest path to addressing this need. Oil-rich countries in the Middle East are turning to solar energy to meet the growing domestic demand for electricity, freeing up hydrocarbons for export. This book describes the energy transition in Africa and the Middle East, from dependence on fossil fuels to increasing reliance on solar energy. The authors were assisted by the contributions of top experts Wolfgang Palz, Anil Cabraal, and Richenda Van Leeuwen in their efforts to provide a sound basis for understanding where solar energy is heading in these two important global regions.

"A very timely book highlighting how the current energy transition is unfolding in the key regions of Africa and the Middle East. Importantly, the stories of the rapidly changing solar power landscape, which are already deeply affecting developing countries, are engaging and well-balanced with issues of policy and regulation."

Morgan Bazilian, Professor
School of Mines, Golden, Colorado

Peter F. Varadi co-founded Solarex Corporation, USA, in 1973 to develop the utilization of solar cells for terrestrial applications. Solarex was one of the two companies that pioneered this field. By 1983, it became the largest PV Company in the world, when it was sold to AMOCO. Dr. Varadi continued consulting for the European Commission, World Bank, NREL, and other organizations. His book *Sun above the Horizon*, which describes the meteoric rise of the solar industry, and its sequel, *Sun towards High Noon*, were published in 2014 and 2017, respectively.

Frank Wouters has been leading renewable energy transactions and technology development for over 28 years. He developed projects valued at over $5 billion, ranging from small-scale PV solar electrification in Uganda to a strategic equity investment in the world's largest offshore wind project in the UK. Mr. Wouters has served on the boards of several energy companies in Europe, USA, Africa, and Asia and currently is director of the EU GCC Clean Energy Network. Previously, he was deputy director-general of the International Renewable Energy Agency (IRENA).

Allan R. Hoffman holds a bachelor's degree in engineering physics from Cornell University and a PhD in physics from Brown University. Trained in experimental physics, most of his career has been in the planning and management of clean energy technology programs. He has served as staff scientist for the U.S. Senate Commerce, Science, and Transportation Committee and in senior positions at the National Academy of Sciences and the U.S. Department of Energy. Hoffman is a fellow of the American Physical Society and the American Association for the Advancement of Science.

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