Journal of Solar Energy Engineering

Editorial

A Message from the Special Issue Editor

This special issue departs from the tradition of collections dedicated to a specific topic. Instead, it offers a collection of papers from a community of researchers working a specific geographical location. The solar research community in Israel has been active and productive for many decades, making major contributions in a variety of topics related to solar energy. The motivation of researchers in Israel to seek alternative energy sources can be understood when we consider the unusual situation and history of this country. It is embedded in the oil-rich Middle East, but is devoid of any oil resources of its own, and was isolated much of the time politically and economically from its oil-producing neighbors. No wonder that the issue of alternative energy was established very early as one of the top priorities for research and development.

Scientific and engineering research in Israel on solar energy has been extensive since the early 1950's. The article by A. Einav provides an overview of this continuing effort, and major achievements that had a significant impact on the state of the art in solar energy technology. Other articles in this issue describe current research activities in a broad spectrum of topics and technologies. S. Biryukov describes the structure and performance of a parabolic dish, the largest of its kind, at the National Solar Energy Center. Several topics in central receiver technology are presented: R. Bertocchi et al. report work on a particle receiver concept that has already achieved breakthrough high temperatures; A. Kribus et al. report an improvement in tracking of heliostats; C. Sugarmen et al. and U. Fisher et al. discuss methods of connecting gas turbines to solar central receiver plants. In solar chemistry, R. Adinberg et al. and R. Rubin report different approaches to the long-standing goal of producing synthetic hydrocarbon fuels with the help of solar energy. K. Gommed et al. report work on solar cooling, and I. Capeluto et al. report work on building energy analysis. These two topics may seem less 'glamorous' than solar power plant technology, but are very significant in their possible impact on reduction of fossil fuel utilization. Y. Diamant et al. report work on organic photovoltaic cells, and D. Weinstock et al. describe optimization of non-tracking collector fields that could be applicable to photovoltaic as well as thermal collectors. Finally, D. Faiman et al. and A. Dayan et al. contribute reports on surveys and measurement methods of solar radiation. This list presents a broad cross-section, a microcosm that covers many of the important issues and directions that are relevant in state-of-the-art solar research.

In addition to a vibrant and diverse solar research community, Israel has also a significant industrial activity in solar energy. The domestic solar water heater industry is probably the world leader in terms of local market penetration, due to early efforts to optimize the technology, and a decisive government policy that gave this market a push in the right direction. Industry is also active in the area of solar power plants in both the trough and central receiver technologies, although the government has unfortunately not shown the same resolve in promoting these technologies for local use in Israel. Comparing the history of these two solar energy sectors, it becomes clear (as in other countries), that investing in research is not enough. Much first-rate research and development has been performed on solar power plants, both in Israel and elsewhere. However, the resources that can be raised from private and commercial sources are not enough to take the results of this research forward to full commercial implementation. A firm and long-term commitment from the government is needed in order to pass the hurdle of real commercial implementation. Hopefully governments around the world will gradually realize this, and will agree to contribute their share in the effort to promote environmentally benign energy solutions.

I would like to thank all the authors who contributed to this special issue and responded amicably and promptly to the demands and tight schedules imposed on them by the Associate Editor. Special thanks are also due to Prof. Davidson, the Chief Editor, who promoted, encouraged, and guided the effort of producing this special issue.

Abraham Kribus
JSEE Associate Editor (Solar Collectors)
Tel Aviv University
Tel Aviv, Israel

