

Brief Review and Select Bibliography of Developments in Solar Photovoltaics in the ASEAN Region

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ABSTRACT

With international developments bringing large-scale use of photovoltaics closer to reality as we turn the century, a brief look is taken at PV development in ASEAN and the likely role that applications will play in the future.

While the paper concludes that there is considerable market potential for PV in ASEAN and that usage is increasing, closer monitoring of these developments and better market analysis are required.

A bibliography of articles published over the last decade concerning research, development and applications of photovoltaics in ASEAN is provided to illustrate work being conducted in the region and to provide a basis for further study. The bibliography is select in that it only covers materials published in English and does not include theses.

INTRODUCTION

Two major developments occurred in 1993 which should provide much needed impetus to wider application of PV in ASEAN. The first was the establishment in Perth, Australia, of an International Centre for Applications of Solar Energy (CASE) whose mandate will include the ASEAN region. As the name suggests, the Centre is primarily concerned with applications and their focus will be on industry development in developing countries.

The other major development was the formal establishment of an ASEAN Network on Solar Energy. While yet a fledgling organisation, this Network could be instrumental in promoting wider use of PV, act as an information centre and be actively involved in bringing together researchers and the private sector in the region.

With a collective population touching 300 million by the turn of the century, with over 10,000 inhabited islands – mostly remote from the grid, and with record economic growth, the potential market for photovoltaics in ASEAN is considerable.

PV DEVELOPMENT

Indonesia has been actively promoting renewable energy and for the immediate short-term future, offers the greatest potential for PV applications. As of 1991, installed capacity was over

500 kWp, covering some 300 units. Locally assembled modules and locally manufactured storage systems are already penetrating the market. As with other ASEAN countries, almost all the applications are for remote area power supply. As of 1987, there were 43 known institutions involved in over 122 PV or hybrid projects. Currently, the government is engaged in a program to install a further 3,000 domestic systems for rural areas.

While there is considerable potential for PV applications for the remote communities in Sarawak and Sabah, Malaysia has adopted a wait and see approach on the economics of photovoltaics. As of 1987, there were over 8 known institutions involved in some 17 PV-related projects.

PV has already found wide acceptance in the Philippines and this country, with so many communities remote from the grid, probably offers the greatest long-term potential for PV applications. Some local companies are already involved in the production of PV components, as well as storage systems. As of 1987, approximately 18 institutions were involved in some 26 known projects.

While clearly the potential for PV applications in Singapore is small, the market in such areas as navigation aids, traffic and street lighting and telecommunications should not be overlooked. With a well established electronic components manufacturing industry, Singapore could have a future role to play in producing systems or components.

As of December 1992, installed capacity in Thailand was around 740 kWp, with the last decade seeing an annual increase of around 40-50 kWp. Research in PV technology and system development is well advanced, with facilities covering crystalline and amorphous Si cells, binary and ternary compound cells and molecular beam deposition. Concerted effort is being made in the area of BOS development. Three local PV panel assemblers are actively engaged in the market, with a combined annual production capacity of 980 kWp.

CONCLUSION

For PV, the current and future major international focus is likely to be on mass production for grid-connected systems or space applications. However, for ASEAN, the potential niche market for remote applications is likely to see strong growth, particularly in Indonesia and the Philippines.

The region has a good foundation in solar cell research, local assembly is well established in most countries, and the development and production of BOSs are within the technical and manufacturing capability of the region.

A major contribution to information on PV developments in the region has been made by Lasnier and others at the Asian Institute of Technology in Bangkok. Unfortunately, this work has not been updated and there is a need to more closely monitor the annual growth in capacity and applications in each country. Hopefully, the newly formed ASEAN Network on Solar Energy will address such needs.

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