Full Record

Title: **Market penetration and pay-back period analysis of a solar photovoltaic system under Indian conditions**

Author: Mohan Lal Kolhe, J.C. Joshi, Ganga Agnihotri, A.M. Shandilya

Address: Maulana Azad College of Technology, Regional Engineering College, Bhopal 462007, M.P. India. Centre for Energy Studies, Indian Institute of Technology, Delhi, New Delhi 110016, India. Maulana Azad College of Technology, Regional Engineering College, Bhopal 462007, India. Maulana Azad College of Technology, Regional Engineering College, Bhopal 462007, India
mpkolhe@yahoo.com,

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Abstract: The use of pay-back period analysis for economic evaluation of solar photovoltaic (PV) system reinforces the importance of the duration of the system. In a dynamic economic environment, the cost of energy increases at a faster rate than the common inflation rate. A time can be ascertained at which the market entry of the PV system will be profitable, i.e. at which the pay-back time drops below a value considered as the market threshold, provided the parameters describing the dynamic economic system remain unchanged. The market penetration of the PV system has been determined in Indian economic conditions and found to depend mainly on PV array costs and energy income reinvestment rate. The low PV array cost, high-energy income reinvestment rate, high solar cell reference efficiency and high battery efficiency have a substantial effect on the reduction of the energy price and pay-back period with early market penetration by the PV system.

Keywords: photovoltaic (PV) system; pay-back period; market penetration; renewable energy economics.