

국내 태양에너지 자원 정밀분석

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A Detailed Analysis of Solar Radiation Resources in Korea

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Since the solar energy resource is the main input for sizing any solar photovoltaic system and solar thermal power system, it is essential to utilize the solar radiation data as a application and development of solar energy system increase. It will be necessary to understand and evaluate the insolation data. The Korea Institute of Energy Research(KIER) has begun collecting horizontal global insolation data since May, 1982 at 16 different locations in Korea and for the more detailed analysis, Images taken by geostationary satellite may be used to estimate solar irradiance fluxes at earth's surface. It is based on the empirical correlation between a satellite derived cloud index and the irradiance at the ground.

From the results, the measured data has been collected at 16 different stations and estimated using satellite at 23 different stations over the South Korea from 1982 to 2009. The Result of analysis shows that the annual-average daily global radiation on the horizontal surface is 3.56 kWh/m²/day.

Key words : 태양에너지 자원 (Solar Radiation Energy Resource), 수평면 전일사량 (Horizontal Global Insolation)

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Solar Radiation Measurement and Data Quality Management

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Solar radiation data are used in several forms and for a variety of purposes. The most detailed information we have is beam and diffuse solar radiation on a horizontal surface, by hours, which is useful in simulations of solar processes. Daily data are more often available and monthly total solar radiation on horizontal surface can be used in some process design methods. However, as performance is generally not linear with solar radiation, the use of average may lead to serious errors if non-linearities are not taken into account. It is also possible to reduce radiation data to more manageable forms by statistical methods.

The control of the quality of most measurements is relegated to the control of the measuring instruments and measuring processes themselves. An accurate measurement will usually result from the use of a high-quality instrument that has been accurately calibrated and is properly used by a qualified individual.

Key words : Calibration Procedure(교정절차), Pyranometer(수평면일사계), Irradiance(복사조도), Reference Instrument(표준준기), Calibration Coefficient(교정계수)

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