Australian Solar Radiation Data Handbook (ASRDH) and Calculator (AUSOLRAD)

ASRDH 4 (Main Report and Tables)

In 2006, ANZSES published the 4th edition of the ASRDH with partial funding support of the Australian Greenhouse Office. At last this document is of the quality and reliability that the solar industries and researchers need and deserve. It is primarily the work of Trevor Lee (Energy Partners, Canberra), Dr Mark Snow (Energy Partners, Canberra) and Brett Stokes (Adelaide Applied Algebra).

The raw data comes originally from the Bureau of Meteorology (BOM) as real time sets of half hourly global and diffuse irradiation measurements taken on the horizontal plane. A few BOM sites also measured the irradiation normal to the solar beam. To this group of 22 measuring stations, a further six sites were added for geographic completeness - here irradiation has been estimated using long term cloud cover data and more recently the daily data inferred from satellite observations of radiation reflected back to space. These 28 data sets were then processed to give climatic means for time of day and time of year for a wide range of surface orientations and tilts of engineering and architectural significance.

The tables include mono- and bi-polar sun-tracking and the differentiation of direct beam and diffuse (sky and cloud scattered) and ground-reflected radiation components. There is also extensive tabulation of probabilities and frequencies of irradiation falling below given levels for particular durations which is needed by designers of storage capacities, particularly for stand alone solar systems.

The hinterlands of the 8 capital cities are also mapped with spatial and seasonal/annual variation of irradiation shown in a series of isorad (contour) maps based on recent data collected from satellite observations of radiation being reflected back to space from the earth's surface. This is particularly helpful in refining a design beyond the edges of the metropolitan areas.

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Limitations of Edition 3 (now superseded)

The 3rd edition, published in 1995, was developed by ANZSES for the now defunct Australian Energy Research and Development Corporation (ERDC). The editorial team then was Trevor Lee (ANU, Canberra), David Oppenheim (architect, Melbourne) and Terry Williamson (University of Adelaide). The bulk of the programming and data processing was done by Brett Stokes of (Adelaide Applied Algebra). Its primary achievement over the 1st edition (the 2nd was a short-lived interim patch) was the elimination of the erroneous algorithm in the sun's position which had a marked effect on the accuracy of the tabulated irradiation of steeply sloped surfaces, especially walls and windows. However, because the Bureau of Meteorology undertook a mainframe computer upgrade at the time the 3rd edition was being prepared, the original raw data from the BOM had to be reused. That data was all pre-1986 when BOM's quality control of its solar measurement was less than it is now and, importantly, measurement had only begun in 1983 in Adelaide, Brisbane, Canberra and Sydney.

AUSOLRAD (software)

The 2nd version of AUSOLRAD and associated electronic files of data for 28 Australian locations is now available. It employs the same raw data from the BOM as the ASRDH 4 does.

In its enhanced form, rewritten in VB.NET for MS-Windows, AUSOLRAD is for those who want the flexibility of surface orientation and tilt to assess real designs that, for whatever reason, cannot be constructed to the ideal geometries that are tabulated in the Handbook itself.

AUSOLRAD allows for any geometry (to the nearest 1°) of surface, aperture or window (including downward-facing), any eaves overhang and any non-specular reflectivity (albedo) of the "ground" in front of the surface.

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Other Climate Data in addition to Solar

Full climate data for energy engineering and architectural use will soon be available from ANZSES.

To register your interest contact the ANZSES Administrator - details below:

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