Solar and Coincident Weather Data for Large Scale Solar Deployment

Trevor Lee

ENERGY PARTNERS

[Map of Australia showing solar irradiation]

[Graph showing solar irradiation of key surfaces in Grad and c/sec]

Legend:
- Global
- Direct on H (Horizontal)
- Direct Beam (Normal)
- Total Monthly Vertical
- Total Monthly Lat/Lon 12°
- Total Monthly 4° Tall
- Total Monthly 11° Tall
Climate Data for Renewable Energy and Energy Conservation Applications

The Australian Solar and Climate Resource
- Australian Solar Radiation Data Handbook background and applications

Beyond TMY: Climate Data for Specific Applications
- Australian Climate Data Bank and using Reference Meteorological Years

Creation of Ersatz Future Weather Data Files
- Measuring energy performance of buildings under predicted future weather conditions
Associated Papers

- **CREATION OF ERSATZ FUTURE WEATHER DATA FILES (Solar 08)**
  - Trevor Lee and David Ferrari
  - Energy Partners, PO Box 4170, Manuka ACT 2603, Australia

- **AUSTRALASIAN SOLAR RADIATION DATA PROPOSAL FOR ENHANCED KNOWLEDGE DISSEMINATION (Solar 08)**
  - Trevor Lee
  - Energy Partners, PO Box 4170, Manuka ACT 2603, Australia

- **THE AUSTRALIAN CLIMATIC DATA BANK (Solar 06)**
  - Trevor Lee and Mark Snow
  - Energy Partners, PO Box 4170, Manuka ACT 2603, Australia

- **DEVELOPMENT OF CLIMATE DATA FOR BUILDING RELATED ENERGY RATING SOFTWARE (Solar 05)**
  - Barbara Ridley and John Boland
  - Centre for Industrial and Applicable Mathematics University of South Australia
  - Mawson Lakes Boulevard, Mawson Lakes SA 5095, Australia
ASRDH – Geographic Coverage

[Map of Australia showing cities and towns]
BCA – Geographic Coverage
Geographic Coverage – New Zealand
ASRDH - Sample Graphical Summary

The image displays a sample graphical summary with a color-coded map. The map indicates different regions based on values: above 7.4, 7.1 to 7.4, 6.9 to 7.1, 6.6 to 6.9, and below 6.6. The map also shows a scale indicating location at the centre of the map. The scale provides a reference of 0 km to 50 km.
ASRDH - Sample Graphical Summary

Hobart mean_global_spring
above 17.2
16.7 to 17.2
6.1 to 16.7
5.6 to 16.1
below 15.6

Hobart mean_global_summer
above 22.0
20.9 to 22.0
19.9 to 20.9
18.8 to 19.9
below 18.8

Hobart mean_global_autumn
above 10.7
10.2 to 10.7
9.8 to 10.2
9.3 to 9.8
below 9.3

Hobart mean_global_winter
above 7.4
7.1 to 7.4
6.9 to 7.1
6.6 to 6.9
below 6.6
Exemplary ASEA - Sample Graphical
Quality Assurance

- Minute-by-minute interpolation
- ACDB or TMY accumulation
- Cap values at 110% Clear Sky
- Cap DNI at DHI = 90% GHI
- Compare with BOM and other reliable ground stations
- Select nearby “pixel” when >50% sea
Detailed Comparisons - Beam
Detailed Comparisons - Diffuse

![Graph showing detailed comparisons of diffuse radiation. The graph plots diffuse radiation (W/m²) against solar altitude (°) for different time points from 27/09/2009 5:00 to 27/09/2009 8:00. The comparison includes data from Field, BOM, Duffie & Beckman, 2005 ASHRAE, 2009 ASHRAE, and Solar Altitude.]
Conclusions

- Solar and Coincident Weather Data for almost anywhere
- Can target Large Scale Solar Deployment
- Key sites for publication
- Real time data series
- Exemplary Solar Energy Atlas
Solar and Coincident Weather Data for Large Scale Solar Deployment

Questions?

Trevor Lee