1. Record Nr. UNINA9910809402103321

| | |
|---|---|
| Autore | Brownson Jeffrey R. S |
| Titolo | Solar energy conversion systems / / Jeffrey R.S. Brownson |
| Pubbl/distr/stampa | Oxford : , : Academic Press, , 2014 |
| ISBN | 0-12-397315-5 |
| Edizione | [First edition.] |
| Descrizione fisica | 1 online resource (x, 457 pages) : color illustrations |
| Collana | Gale eBooks |
| Disciplina | 621.47 |
| Soggetti | Solar energy |
| Lingua di pubblicazione | Inglese |
| Formato | Materiale a stampa |
| Livello bibliografico | Monografia |
| Note generali | Description based upon print version of record. |
| Nota di bibliografia | Includes bibliographical references and index. |
| Nota di contenuto | Half Title; Quote Page; Title Page; Copyright; Contents; Acknowledgements; 01 Introduction; Design Concept; Instructional Approach; Suggested Course Schedule with Text; Communication of Units and a Standard Solar Language; 02 Context and Philosophy of Design; A Rationale and History for Design of SECS; Systems and Patterns; Systems Design; The Ethics of Sustainability; Ecosystem Services; Limitations of the Goal; Framework: Solar as Lighting Aid; Framework: Solar Rights and Access; Framework: Solar Power Entrepreneurs; Framework: Solar Ecosystem Services<br>Framework: Solar for Energy Independence Problems; Recommended Additional Resources; 03 Laws of Light; Light is a Pumping System; SECS and Light; Light is Directional; Light is Spectral; Light Decreases with Distance; Four Laws of Light; Kirchoff's Law; Wien's Displacement; Planck's Law; Stephan-Boltzmann Equation and Fractions of Radiation; Problems; Recommended Additional Reading; 04 Physics of Light, Heat, Work, and Photoconversion; Breakthrough: Not Light or Heat-Both; It's in the History Books; Light for a Caloric Response; Materials in Energy Conversion Systems<br>Selective Surfaces and Graybodies: Opaque Radiative Exchange for One Surface; Diffuse Gray Surface Approximation:; Radiative Exchange for Two Surfaces; Reflectivity and Reflectance for Semi-transparent Materials; Problems; Recommended Additional Reading; 05 Meteorology: the Many Facets of the Sky; Air Masses; The Sky as Multiple Climate Regimes; No Sky Model; Blackbody Accounting (no sky cover); A Change of Variables: 0-100 Round Numbers; |

Blackbody+Graybody Accounting (no sky cover); Graybody Accounting with a Cover; Graybody Accounting with a Cover and a Leaky Valve; The Role of Clouds
Clear Sky Modeling Components of Light; Hottel Clear Sky Beam Model (1976); Bird Clear Sky Model (1981); Spatio-Temporal Uncertainty; Robot Monkey Does Space-Time; Problems; Recommended Additional Reading; 06 Sun-Earth Geometry; Experiment with a Laser; Spatial Relations; Spherical Coordinates; Earth-Sun Angles; Time Conversions; Daylight Savings Time Correction; Longitude Time Correction (t); Analemma Time Correction (Et); Putting Time Correction Together; Moments, Hours, and Days; Finding Sunset, Day Length, and h0; Sun-Observer Angles; Collector-Sun Angles; A Comment on Optimal Tilt Robot Monkey Does Spherical Derivation! Problems; Recommended Additional Reading; 07 Applying the Angles to Shadows and Tracking; Shading Estimation; Projections of Spherical Data; Shading Estimation: Critical Point and Plotting; Wing Wall; Awning; Array Packing; Tracking Systems; Problems; Recommended Additional Reading; 08 Measure and Estimation of the Solar Resource; Measuring Light; Measurement Terminology:; Meteorological Years: Collage of Data; Human Vision: Logarithmic Detection versus Linear; Gross Measure: Sunshine Duration; Pyranometer: Global Irradiance Measurements
Diffuse and Direct Normal Measures

Sommario/riassunto

Solar energy conversion requires a different mind-set from traditional energy engineering in order to assess distribution, scales of use, systems design, predictive economic models for fluctuating solar resources, and planning to address transient cycles and social adoption. Solar Energy Conversion Systems examines solar energy conversion as an integrative design process, applying systems thinking methods to a solid knowledge base for creators of solar energy systems. This approach permits different levels of access for the emerging broad audience of scientists, engineers, archit