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- Home
- Invitation
- History of Chemeca
- Hosts
- Awards
- Plenary/Keynote Speakers
- Nanoparticle Safety
- Journal Special Issues
- Chem-E-Car
- Timetable
- Presenters
- Abstracts
- Important Dates
- Functions
- Tours/Travel
- Destination
- Sponsor / Exhibit
- Committees
- Related Meetings
- Links
- Media / Publications

## Energy Resource quality assessment of PV/wind hybrid renewable energy system

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Renewable energy is seen as one of the main solutions of greenhouse gas emissions in many countries. With the widely application of renewable energy, it shows increasing interests on the sustainability assessment of energy system. Resource quality assessment is an important sub-indicator of sustainability index (SI) for evaluating energy systems. Hybrid renewable energy system (HRES) comprising of number of elements aims to convert any form of primary energy into finale form of energy to be used for improving the quality of life. Energy conversion processes of each component are characterized by the entropy production and exergy loss. Although solar energy, wind energy and electrical energy are different in nature, exergy theory can be used to evaluate and compare them. The present study develops a method based on the first law and second law of thermodynamic to quantify the resource quality of each type of renewable energy component of a PV/wind HRES. A case study of an optimized PV/wind power system in central Queensland region is presented. Through the exergetic analysis of solar and wind energy resource and investigation on the electricity production, the quantified results of exergy efficiency and exergy flow of the given system are discussed.



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