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Wendell de Queiróz Lamas

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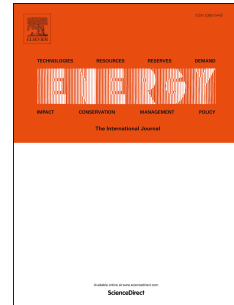
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Exergo-economic analysis of a typical wind power system

Wendell de Queiróz Lamas*

*Department of Basic and Environmental Sciences
School of Engineering at Lorena
University of Sao Paulo
12602-810, Lorena, SP, Brazil*

Abstract

The objective of this work is to list irreversibilities throughout the wind power system and to use this information to develop a sequence of equations representative of system constraints associated to its objective function, known as EPC (exergetic production cost), also to allocate costs of products generated into this system. The methodology is based on the system functions identification as a whole and from each unit individually, in the construction of the thermo-economic functional diagram, in the formulation of the cost problem of the system being studied and in the solution of the cost equations system of the associated products. Equations related to wind power system features are listed, such as air flow power, air mass flow, physical exergy (or general flow exergy), kinetic exergy, and turbine output power. It is possible to observe that the cost for wind power system is directly related to interest rate applied, also its decrease (cost) depends of the time of amortisation, and that the revenue for wind power system is between three and a half years and around five years.

Keywords: exergetic production cost, exergo-economics, wind power system

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*Corresponding author

Email address: wendell.lamas@usp.br (Wendell de Queiróz Lamas)

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