

Accepted Manuscript

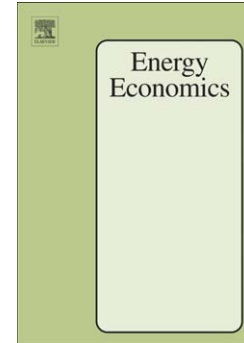
Portfolio optimization of renewable energy assets: Hydro, wind, and photovoltaic energy in the regulated market in Brazil

Daywes Pinheiro Neto, Elder Geraldo Domingues, António Paulo Coimbra, Aníbal Traça de Almeida, Aylton José Alves, Wesley Pacheco Calixto

PII: S0140-9883(17)30086-5
DOI: doi:[10.1016/j.eneco.2017.03.020](https://doi.org/10.1016/j.eneco.2017.03.020)
Reference: ENEECO 3591

To appear in: *Energy Economics*

Received date: 3 March 2016
Revised date: 14 March 2017
Accepted date: 18 March 2017



Please cite this article as: Neto, Daywes Pinheiro, Domingues, Elder Geraldo, Coimbra, António Paulo, Almeida, Aníbal Traça de, Alves, Aylton José, Calixto, Wesley Pacheco, Portfolio optimization of renewable energy assets: Hydro, wind, and photovoltaic energy in the regulated market in Brazil, *Energy Economics* (2017), doi:[10.1016/j.eneco.2017.03.020](https://doi.org/10.1016/j.eneco.2017.03.020)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Portfolio optimization of renewable energy assets: Hydro, wind, and photovoltaic energy in the regulated market in Brazil

Daywes Pinheiro Neto^{a,b,*}, Elder Geraldo Domingues^a, Antônio Paulo Coimbra^c, Aníbal Traça de Almeida^c, Aylton José Alves^a, Wesley Pacheco Calixto^{a,b}

^a*Nucleus for Experimental and Technological Studies-NExT, Federal Institute of Goiás, ZIP: 74055-110, Goiânia, Brazil*

^b*School of Electrical and Computer Engineering, University of Goiás, ZIP: 74605-010, Goiânia, Brazil*

^c*ISR, Dept. of Electrical and Computer Engineering, University of Coimbra, ZIP: 3030-290, Coimbra, Portugal*

Abstract

This study proposes a methodology for risk analysis and portfolio optimization of power generation assets with hydro, wind, and solar power, considering the Regulated Contracting Environment and the Mechanism for Reallocation of Energy in Brazil. Innovative stochastic models are used to generate synthetic time series for the random variables water inflow, wind speed, solar irradiance, temperature of the photovoltaic panel, and average generation capacity of the Mechanism for Reallocation of Energy. The simulation is implemented using the Monte Carlo method associated with a Cholesky decomposition. An economic approach is presented taking into account taxation and financing, as well as the Markowitz Portfolio theory. The results show that the initial correlation between the energy resources is altered by the cash flow model and mainly by the debt. In the diversification process, the complementarity between sources helps to reduce the economic risk. The increase in debt increases the correlation, decreases the return and risk and, consequently, affects the diversification process and economic results. The Mechanism for Reallocation of Energy significantly reduces the hydroelectric economic risk and increases the financial return, which directly benefits the formation of portfolios.

Keywords: Monte Carlo Method, Renewable Energy, Risk Analysis, Mechanism for Reallocation of Energy, Portfolio Optimization.

*Corresponding author

Email address: daywes.p.n@ieee.org (Daywes Pinheiro Neto)

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات