Accepted Manuscript

Parametric methods for probabilistic forecasting of solar irradiance

Seyyed A. Fatemi, Anthony Kuh, Matthias Fripp

PII: S0960-1481(18)30653-0

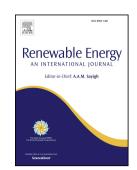
DOI: 10.1016/j.renene.2018.06.022

Reference: RENE 10178

To appear in: Renewable Energy

Received Date: 13 January 2018

Revised Date: 19 May 2018 Accepted Date: 7 June 2018



Please cite this article as: Fatemi SA, Kuh A, Fripp M, Parametric methods for probabilistic forecasting of solar irradiance, *Renewable Energy* (2018), doi: 10.1016/j.renene.2018.06.022.

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.

ACCEPTED MANUSCRIPT

Parametric Methods for Probabilistic Forecasting of Solar

Irradiance

Seyyed A. Fatemi^{a,*}, Anthony Kuh^a, Matthias Fripp^a

^aUniversity of Hawaii at Manoa

Abstract

This paper proposes two parametric probabilistic forecast methods using beta and twosided power distributions to predict solar irradiance. It also evaluates their perfor-

mance. To improve their performance metrics a hybrid procedure based on the beta

transformed linear opinion pool is utilized. Our simulations show that these methods –

despite their simple structure – can effectively forecast solar irradiance and accurately

describe its stochastic characteristics. The proposed approach is flexible and could be

extended to many different point forecast methods which otherwise minimize $\ensuremath{\mathsf{RMSE}}$

or MSE.

Keywords: Probabilistic forecast, solar radiation, power system

1. Introduction

Using renewable energy sources like wind and solar power is a key solution for environmental concerns such as air and water pollution and climate change associated

with using fossil fuel resources, as well as long-term economic and political concerns

regarding depletion of fossil fuel resources. Solar energy is the most abundant renew-

able energy source on the earth surpassing hydro power, geothermal, wave and tides,

biomass, and wind. In recent years photovoltaic (PV) generation has rapidly increased

as it provides a competitive solution for sustainable electricity generation. For example

the total PV generation capacity reached 40 GW in the United States after installation

*Corresponding author

Email address: sfatemi@hawaii.edu (Seyyed A. Fatemi)

Download English Version:

https://daneshyari.com/en/article/6763979

Download Persian Version:

https://daneshyari.com/article/6763979

<u>Daneshyari.com</u>