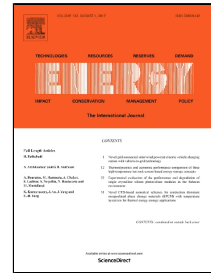# Accepted Manuscript

Nonlinear Empirical Pricing in Electricity Markets using Fundamental Weather Factors

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1   **Nonlinear Empirical Pricing in Electricity Markets using Fundamental Weather**

2   **Factors**

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10   **Abstract**

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12   A nonlinear factor model based on fundamental weather variables, in addition to market-

13   related variables, is proposed for modeling the price of electricity. The full conditional

14   distribution of electricity prices using quantile regressions is modeled and the effect of

15   weather factors on upside and downside risks in the electricity market is analyzed. Data from

16   the Nord Pool is used to fit the proposed model to a wide and highly integrated market, as

17   well as several individual national markets, and to search for possible asymmetries in both

18   individual and aggregated levels of the price dynamics. By doing so, important differences

19   across countries and quantiles in the price responses to weather variations are documented,

20   but mostly extensive evidence in favor of the quantile-factor model based on weather

21   variables is provided.

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25   **1. Introduction and Literature Review**

26   Factor models are currently milestones for the analysis of electricity prices. Both practitioners

27   and academics rely heavily on such models to forecast and explain the dynamics of spot and

28   forward prices. The key point in factor-pricing models is the selection of explanatory factors

29   to be included in a potential empirical specification. When envisioning factors to include in

30   a pricing equation, the literature can be divided into two streams. On one hand, chosen factors