Modeling and forecasting industrial end-use natural gas consumption

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Abstract-

Forecasting industrial end-use natural gas consumption is an important prerequisite for efficient system operation and a basis for planning decisions. This paper presents a novel prediction model that provides forecasting in a medium-term horizon (1–3 years) with a very high resolution (days) based on a decomposition approach. The forecast is obtained by the combination of three different components: one that captures the trend of the time series, a seasonal component based on the Linear Hinges Model, and a transitory component to estimate daily variations using explanatory variables. The flexibility of the model allows describing demand patterns in a very wide range of historical profiles. Furthermore, the proposed method combines a very simple representation of the forecasting model, which allows the expert to integrate judgmental analysis and adjustment of the statistical forecast, with accuracy and high computational efficiency. Realistic case studies are provided.

Index Terms- Natural gas demand; Medium-term forecasting; Judgmental forecasting; Decomposition models

Citation:
Sánchez-Úbeda, E.F.; Berzosa, A. "Modeling and forecasting industrial end-use natural gas consumption", Energy Economics, vol.29, no.4, pp.710-742, July, 2007.