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Data mining based framework for exploring household electricity consumption patterns: A case study in China context

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Abstract: This study proposes a data mining based framework for exploring the electricity consumption patterns, which includes three consecutive stages. Firstly, electricity consumption patterns and behaviors are explored in festivals such as the Spring Festival, the Labor Day and the National Day. Secondly, seasonal electricity consumption patterns and behaviors are compared, and the relationship between temperature and electricity demand is analyzed through data visualization. Thirdly, we focus on the phenomenon of electricity consumption patterns shifting. Finally, a case study of Nanjing and Yancheng City, Jiangsu Province, China is presented. The results indicate that: (1) Volatility of electricity consumption is higher in winter and summer than in spring and autumn. (2) There are three typical load profiles during the Spring Festival, two typical load profiles during the Labor Day the National Day. (3) High temperature in summer and low temperature in winter have obvious influence on electricity consumption. However, the electricity consumption peak lags one or two days behind the temperature peak in summer, and consumers' response time gets shorter as the frequency of temperature peaks increase. (4) The phenomenon of instability of household electricity consumption patterns is identified. 7.22% of

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