

国家重点基础研究项目

计及时滞指标综合灵敏度的用户电价响应模式划分方法

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摘要:

基于电量电价弹性矩阵, 提出了电价响应时滞性的概念与数学模型, 研究了时滞响应的稳定状态, 量化了时滞性指标。结合需求响应弹性系数, 对335个用户进行需求响应分析, 采用模糊C均值聚类方法, 将具有共同电价响应特征的用户分类, 并用不同用户时间断面负荷曲线验证了该分类结果的有效性。结合需求响应弹性系数, 利用综合灵敏度矩阵对多个用户进行分析, 将具有共同响应特征的用户分类, 扩大了响应矩阵的维度, 扩展了用户的响应信息。算例结果表明, 该时滞性指标能快速找出对电价调整有响应的用户, 并对用户响应时滞性能做出评价。该方法对减小响应不确定性, 修正购售电计划、调度方式、交易计划有积极意义。

关键词:

An Approach to Divide Customer Price Response Modes Taking Comprehensive Sensitivity of the Time Delay Index Into Account

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Abstract:

Based on the elastic coefficient matrix of electricity quantity and price, a concept of time-delay of electricity price response and its mathematical model are proposed. The stable state of time-delay response is researched and the time-delay index is quantized. According to elastic coefficient of demand response, the demand response of 335 customers is analyzed; by use of fuzzy C-means clustering, the customers possessing common price response characteristics are classified, and the effectiveness of classification results is verified by customer load curves at different days after the price adjustment. Combining with elastic coefficient of demand response and using comprehensive sensitivity matrix, multi customers are analyzed and the customers with common response characteristics are classified, thus the dimensionality of response matrix is enlarged, and the response information of customers is expanded. Calculation example results show that the proposed time-delay index can find up these customers rapidly which respond to price adjustment, and give the assessment on time-delay characteristics of customers. The proposed method can be applied in reducing uncertainty of response, modifying selling and purchasing scheme of electricity, modifying dispatching modes and trading plan.

Keywords:

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