

Prediction-Based Midterm Operation Planning for Energy Management of Exhibition Hall

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Abstract : Large exhibition halls require a lot of energy to maintain comfortable atmosphere for the visitors viewing inside. One way of reducing the energy cost is to have thermal energy storage systems installed so that the thermal energy can be stored in the middle of night when the energy price is low and then used later when the price is high. To minimize the overall energy cost, however, we should be able to decide how much energy to save during which time period exactly. If we can foresee future energy load and the corresponding cost, we will be able to make such decisions reasonably. In this paper, we use machine learning technique to obtain models for predicting weather conditions and the number of visitors on hourly basis for the next day. Based on the energy load thus predicted, we build a cost-optimal daily operation plan for the thermal energy storage systems and cooling and heating facilities through simulation-based optimization.

Keywords : building energy management, machine learning, operation planning, simulation-based optimization

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