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Mathematical Modeling of District Cooling Systems

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Abstract : District cooling systems have captured the attentions of many researchers recently due to the enormous benefits offered by such system in comparison with traditional cooling technologies. It is considered a major component of urban cities due to the significant reduction of energy consumption. This paper aims to find the optimal design and operation of district cooling systems by developing a mixed integer linear programming model to minimize the annual total system cost and satisfy the end-user cooling demand. The proposed model is experimented with different cooling demand scenarios. The results of the very high cooling demand scenario are only presented in this paper. A sensitivity analysis on different parameters of the model was performed.

Keywords : Annual Cooling Demand, Compression Chiller, Mathematical Modeling, District Cooling Systems, Optimization
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