

Modelling the Impact of Installation of Heat Cost Allocators in District Heating Systems Using Machine Learning

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Abstract : Following the regulation of EU Directive on Energy Efficiency, specifically Article 9, individual metering in district heating systems has to be introduced by the end of 2016. These directions have been implemented in member state's legal framework, Croatia is one of these states. The directive allows installation of both heat metering devices and heat cost allocators. Mainly due to bad communication and PR, the general public false image was created that the heat cost allocators are devices that save energy. Although this notion is wrong, the aim of this work is to develop a model that would precisely express the influence of installation heat cost allocators on potential energy savings in each unit within multifamily buildings. At the same time, in recent years, a science of machine learning has gain larger application in various fields, as it is proven to give good results in cases where large amounts of data are to be processed with an aim to recognize a pattern and correlation of each of the relevant parameter as well as in the cases where the problem is too complex for a human intelligence to solve. A special method of machine learning, decision tree method, has proven an accuracy of over 92% in prediction general building consumption. In this paper, a machine learning algorithms will be used to isolate the sole impact of installation of heat cost allocators on a single building in multifamily houses connected to district heating systems. Special emphasises will be given regression analysis, logistic regression, support vector machines, decision trees and random forest method.

Keywords : district heating, heat cost allocator, energy efficiency, machine learning, decision tree model, regression analysis, logistic regression, support vector machines, decision trees and random forest method

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