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Artificial Intelligence for Energy Consumption Reduction: The case of the Upper Rhine Region

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Abstract

Buildings energy saving is one of the most important energy issues of our time. Buildings represent the largest energy-consuming sector in the economy as reported by the International Energy Agency (IEA) in 2013. In 2015, the JRC (Joint Research Center) of the European Commission published a study that shows that domestic and commercial buildings consume approximately 40% of the total electrical energy in Europe and more than a third of the power demand at peak times. A similar study was conducted in the United States by the U.S. Energy Information Administration's (EIA).

For a good energy management and consumption reduction in a prosumer building, it's important to know in real time the different parameters of electrical signals. The nature and characteristics of these electrical signals, often related to the morphology of the signal or its frequency content, have led to the use of artificial intelligence techniques. Methods such as ADALINE or Machine Learning open new possibilities for the identification of electrical power parameters.

Two examples from European projects will be discussed (www.asimute.uha.com and www.smi.uha.fr)

Keywords and phrases Artificial Intelligence, Adaptive Filters, Energy Reduction, Self-Consumption, Building Management.

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