

# Analysis of High Frequency Energy Consumption Smart Meter Data

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## Relevance – challenges, problem or opportunity?

Relevance – challenges, problem or opportunity? The Danish act, “Bekendtgørelse om fjernaflæste elmålere og måling af elektricitet i slutforbruget” requires all end consumers of energy to have a smart meter installed in their homes no later than end of 2020. The meters are required to report the consumption with a maximum interval of 15 minutes, but likely shorter. This generates huge amounts of data, at least 35040 points per household. These data will be used in the CITIES (Center for IT Intelligent Energy Systems in cities) project., to classify consumers and characterize their consumption.

## Research question?

1: What is the current state-of-the-art in smart meter analytics?

2 What statistical learning algorithms perform well in classifying consumers using smart meters, and how does it compare to socio- economic classification?

3 How can smart meter data be used to characterize energy consumption?

4 How can smart meter data be used to decompose consumption in active (habitants) and passive (building) consumption and estimate the household flexibility?

## Method

The project will focus heavily statistical learning and time series modelling. Firstly I will have to develop a way to compare time series in order to classify them. I plan on using SVM, NN, and clustering for classifying and then use time series theory to characterize the consumption in each classes. Finally I'll compare my model with socio-economic classification, and investigate flexibility. This will be a Design-Science-Research project as I will try to solve a problem with a new artifact.

## Expected results

Ability to classify energy consumers and characterize their consumption using software produced during the project.



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CITIES Project WP1

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