# Project plan

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March 5, 2019

## 1 Project description

**Title:** Statistical models for analysis of frequent readings of electricity, water and heat consumption from smart meters.

SEAS-NVE has seen the potential and have, in cooperation with DTU Compute, developed the app Watts, which analyze the electricity consumption for a costumer and advises the consumer on how to make better use of electricity, be more green and save money on the bill. In this project we will extend the features to include the heat consumption for a costumer. We will choose some of many interesting ideas we have to further develop features in the app. Hence the core is to apply statistical modelling techniques - exactly which type of model is most suited depends on the application, and use the model output as basis for a feature in the app.

`https://projektbank.dtu.dk/da-dk/Sider/BulletinView.aspx?EntityId=12fafbd2-a980-e611-80f8-005056a057de`

## 2 Work plan

**1** To make an exploratory analysis to examine dependencies in the available data.

**2** To apply simple statistical models in order to investigate the influence of different variables on the heat consumption for each house. This will include some of the following approaches:

- A moving window analysis of the parameters, and comparison of significance of the parameters for different houses.
- Determine periods in the data that deviates from the normal behavior, e.g. summer vs winter, weekdays vs weekends or holidays.

- Determine the influence that the area and year of construction of a house has on its heat consumption, if any exists.

**3** To establish models for the hourly data as a time series, to make a mapping of different tendencies for the heat consumption during the day. Some of the following tendencies will be taken into account:

- Is there a wood stove in the house? If so, when is it used?
- How is the tap water consumption distributed?
- Is there night-time drop/day-time drop?
- What is the relation between sunlight and the heat consumption of a house?

**4** To make forecasts for the heat consumption in the different households using the chosen models. We want to make the models as robust as possible for large scale use in the Watts app. This will include

- making the models able to disregard new data that is not suited for modelling.
- Selecting key parameters for presenting the data to users.

# 3 Timeline

During each period, we will make sure to write the corresponding chapters of the report.

**Week 1-4:** Processing the data.

**Week 4-6:** Exploratory analysis.

**Week 7-10:** Simple statistical models.

**Week 11-13:** Time series models for the hourly data.

**May:** Exams

**Week a (30/5-6/6):** Forecasts.

**Week b (7/6-13/6):** Fixing possible 'problems', finishing the report.

**Week c (14/6-20/6):** Finalizing the report (brownie points). Proofreading.

**20th of June:** Submission.