Research Protocol for Technology Evaluation

Abstract

# Study Description

As the population increases and the energy requirements in households continue to…

## Study Question

Practical problem: People do not use energy in a smart way.

* People do not use PV electricity in an optimal level
* Consumers do not know how much their electrical spenditure is (?)
* Consumers are not aware of others consumption either (?)
* Problem concering similar habbits of users
* Peek hours are created because of these habbits

How to use energy in a smart way? Creating an easier situation for producers during peek time.

What will be the effect of propper feedback related to energy usage (habbits)?

* What is the propper feedback?
* Will the spenditure decrease as a result of information by the system?
* What kind of usage do we focus on? Total usage vs. related usage. E.g. avoiding peek time.

## Rational, previous studies on the subject

**Intro**  
The motivation for this study is to get people to use energy in a smarter way. This does not imply to lower the electricity bill, but rather to use less electricity when the demand is high. By utilising self-produced electricity during peek hours, one is able to influence the powergrid in a very benefitial way. In order to achieve the desired effect, the users of the PV systems needs to be able to see when the demand is high and also in which way their spenditure habbits are affecting the load on the grid. So by aiding the users to gain greater knowledge concerning their own, and their neighbours, usage, we believe that as knowledge grows, so does the interest and motivation to change. The key aspect of this study is to get the participants to change their habits so they use the self supplied electricity during these hours. This will be achieved by using gamification.

**Fogg**  
In order to achieve habit change in the users, it is important that the users are promted with the appropriate feedback from the system. B.J. Fogg´s persuasive technology principles and motivation theory suggests that a combination of stimulating the intristic and and extrinsic motivation is needed in order to change ones habbit. In addition to this a subject needs to be sufficiently motivated before the intervention, he/she needs to have the ability to perform the behavior, and be triggered in order to perform the behavior. More on Fogg´s theory

**Intristic Motivation**This is refering to the individual motivational. This includes setting a goal, creating awareness, challenging tasks, conditioning through positive/negative reinforcement. More.

**Extrinsic Motivation**This builds on social psychology. Other people can be the source of motivation, e.g through competition, cooperation or comparison. More

**Goal Setting with self-monitoring**In the literature review conducted in the early stages of this study, a majority of the articles read, reported that setting goals in addition to being able to monitor the gradual progress towards the goal, was most motivating for the users of the various systems. This is a key point we want to include in our system, in order to get a higher adoption rate and continuous usage among the users. More

**Social aspect**In addition to the finding regarding goal setting, many of the articles described how the social aspect of the system was percieved by the users. In some cases the system itself was enough to increase motivation. However, it was clear that these systems would benefit from introducing a social feature to the system. So the users could challenge their friends, post on social medias, or conduct in social activities.

**Peer pressure**

**Competitions in the community**

**Identification of research gap.**

## Objectives, hypotheses and aims

## Design and methods

### Study design

Qualitative vs. quantitative –

Survey

Case study

Evaluation study / experiment – The change when the game is introduce

#### Description of Technology to be Evaluated

#### Level of maturity required from the technology to be tested

#### Alternative technologies

### Study population

General population? Tech-geeks? Demographi – income,

### Sample size and statistical power

The subset of populations

Case study – one family is enough

### Subjects: selection and definitions

The six families in Konstanz, because of Germany

### Data collection methods: measurements, definition

Questionaire, interviews, phone/skype etc.

### Data management and statistical analysis

Mapping, coding,

## Project management

### Personnel required

### Duration of the study (timeline)

How long will we observe

### Follow-up procedures (if needed)

Reuse of the system

## Strengths and limitations

## References

# Ethical consideration

It is okay to store the user data as long as it is kept within the project. Server hosted at SINTEF for example. Need to cleare with NSD.

# Significance (or expected impact)

# Budget

# Investigators: role of each and curriculum vitae