Overcoming Obstacles to Environmentally Preferable Behavior

Mechanical & Industrial Engineering
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1. Introduction

Client Background

Dr. Lily Shu is a researcher who is interested in the development of solutions that help human beings overcome obstacles faced in the pursuit of environmentally preferable behavior

Goal & Scope

- Certain tenants pre-pay for unlimited energy use
- They have no motivation to act in an environmentally conscious manner
- We proposed to develop a solution that addresses this issue

Objectives

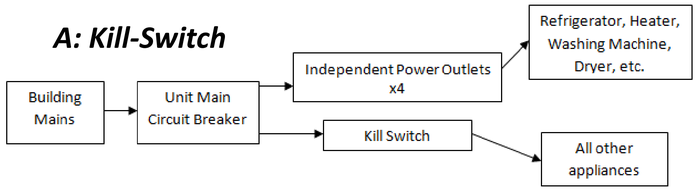
- Long lasting change in human behaviour
- Immediate impact
- Freedom of choice for end-users
- Cost benefit for both user and implementer
- Ease of implementation

2. Methodology

- ***Needs Analysis*** to improve understanding of human wants in relation to the problem
- ***Concept generation*** using DTM tools: stimuli methods, design by analogy, SCAMPER and TRIZ
- ***Concept evaluation*** using Pugh Charts and Decision Matrices

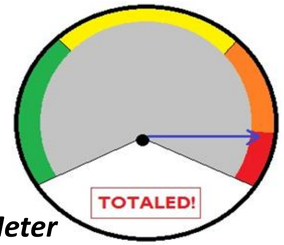
3. Alternatives Considered

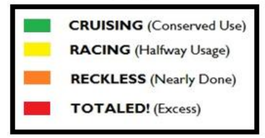
A: Kill-Switch



B: Battery Meter

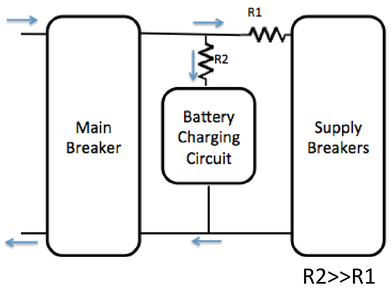
C: Energ-O-Meter





4. Final Design – 'The Battery Meter'

Overall Concept

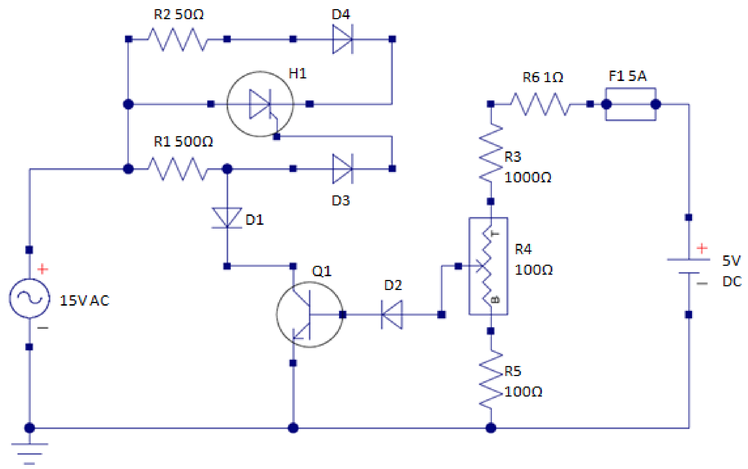


A small amount of power is leached from the supply and used to charge a unique battery

The amount of charge on the battery at the end of the month indicates overall energy usage

Proposed Design

The circuit is designed to be a slow charging system with an incorporated trickle charger that prevents the battery from overcharging and from naturally discharging



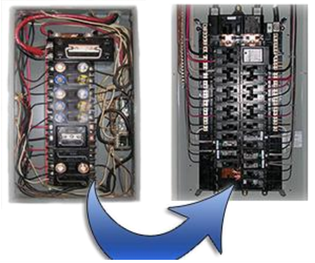
5. Future Work

Competitive Analysis

- Comparative studies on similar products that already exist in real world applications
- Cost-benefit analysis in relation to the installation of regular electricity meters

Proof of Concept

- Implementation of design in model unit
- Measurement of energy consumption by random participants chosen to live in the limited test environment



6. Conclusion

- 'Battery Meters' installed in apartments will give humans a cost based motivation to care about their energy usage
- With the client's requirements in mind, this design is recommended as the best solution to the problem, subject to the results of future work and analyses