Engaging People in Energy Choices

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Problem 1: Complexity of infrastructure and information
Problem 2: Complexity of influencing social choice and practices
Behavior Change approaches in Energy

- Research in energy consumption has highlighted the importance of social norms and social media in formation of choice.
  - Established approaches are not able to exploit the opportunities of technology in turning consumers into active players.
  - Feedback, social norms and values campaigns, and discussion forums on conventional social media.

- These efforts are only partially effective in changing habits and energy choices affecting equipment and infrastructure for their limit in addressing engagement and participation.
Choice Models

- Behavior change models have been dominated by:
  - *rational choice* models, are often employed by psychologists who view environmental behavior primarily as driven by self-interest;
  - the second, *norm-activation* models, tend to be used by researchers who view pro-social motives as most important (Froehlich et al 2010).

- Recently *social constructivist theories* provide alternatives to previous models that tend to reduce agency to the choice of individuals.
Ecolsland

- Environmental CO2 exchange.
- Family quotas.
- Uses sensors and mobile phones for reporting on a home server.
- Visualised as a family island where every family member has an avatar.
- If the CO2 targets are not met, water rises.
- CO2 rights can be traded with other users.
- Saved quotas can be used for purchasing virtual items.
- Collaboration between Waseda University and HIIT.

Ecol Island


Sustainable mobility eco feedback based on automatic tracking

An indicator shows the current detected status of the user.

The user can see how the emissions of the current week compare to the past three weeks.

Middle of the screen shows a breakdown of emissions per transport mode.

Bottom of the screen shows a summary of the active challenges.

A journey planner, making use of the open API provided by HSL, is available for planning new trips.

The user can view a list of past trips.

A more detailed view of ongoing and completed challenges.


Project BeAware

- Support users in adopting virtuous “saving” behaviors can be done using engaging game oriented applications

BeAware: EnergyLife

Intuitive cards
Historic comparison
Overview of saving
Smart Advice and Quiz
BeAware: EnergyLife Saving

Smart advices triggered contextually and tailored to users save more energy

Box plots of electricity consumptions the day before (left) and after (right) reading a smart advice tip. Isolated dots represent outlier observations.
BeAware: Ambient and ubiquitous interfaces

Intuitive tangible interface to quantify watt
Integrating web resources in the domestic environment
Exploring use cases through co-design

End User Programming

3 families (the UK, Finland, South Korea)

4 weeks in each household
Suvilahti Solar Panel Farm

https://www.helen.fi/aurinkovoimalat/suvilahti/
VAPAA AURINKOPANEELI (0)
OSTETTU AURINKOPANEELI (1188)

**Paneeli nro. SUVI505**

Omistaja
Stefano De Pascale

Ostettu 06.10.2014

AURINKOVOIMALAAN ASENETTAVIEN AURINKOPANEELIEN SIJAINTI JA SSAATUUS. KAIKKI PANEELIT TUOTTAVAT SAMAN VERRAN.

https://www.helen.fi/aurinkovoimalat/suivilahti/
Social Dimension in Energy

Empowering new forms of energy-enabled and CO$_2$-aware business models and social aggregations

Information Network
services, applications, databases, infrastructures

Energy System
renewables, distributed generation, smart grids

Social Network
communities, interest groups, collectives, societies
Socially Smart Grid

Physical environment, Citizens and Communities in Cities
- sensors
- energy sources
- social interactions

Behavioral dynamics

Energy data
Energy
Social data

Community decision making

Culture
History
Regulation
Organizations
Technology
Market conditions

Smart Grid

Energy data
Energy
Social data
Our EVIDENCE Approach

- Measures, incentives and other approaches need to take into account the complex layering of the technological environment and tailoring to engage consumers in choice formation.

- The collective emergence and active shaping of choice can be addressed by ubiquitous social media that better support choice across levels of social organization.

- Evaluation platform can be created where measures and incentives can be tested in simulation of the wider network where users are actively shaping technology through end user tailoring.
EVIDENCE Consortium

EVIDENCE FRAMEWORK
How to model networks of relations across social levels and technology layers (UH)

Social Organisation Levels
AALTO
Consumer
Family/Household
Housing Company
Neighborhood
Acquaintances Network
Interest Groups
Communities
....

Infrastructure Layers
VTT
Building , materials
Energy systems
Equipment
Appliances
Devices
Demand Management
Feedback Systems

Changing Infrastructure, equipment etc.
Tailoring, subscribing programs
Habits, operation decisions

EVIDENCE PLATFORM in GreenCampus (VTT UH)
Enduser tailoring, simulation, evaluation, participation in mixed physical digital discussions.
Otaniemi EcoCampus

- Field research in EVIDENCE is in the Otaniemi EcoCampus.
- A secondary mirror site in China is the Tongji GreenCampus.
GreenCampus
EVIDENCE Work Organisation

- **Task 1:** Field and web survey studies from GreenCampus households (N=12 around 40 participants) and web survey data (N=1000) at international level.
- **Task 2:** Analytical framework for understanding energy choice using as methods recent constructivist approaches such as Actor-Network Theory (Latour 2005).
- **Task 3:** Workshops for identification of incentives and measures.
- **Task 4:** Prototyping and interventions with end user tailoring.
- **Task 5:** Simulation of wider energy and social network.
- **Task 6:** Test Bed Platform for evaluating incentives and measures. The GreenCampus is extended to become an evaluation platform.
- **Task 7:** Evaluation in GreenCampus households in Otaniemi and Shanghai.
- **Task 8:** Dissemination and Workshops with stakeholders.
Thank you!

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