

An Energy Lifestyles Program for Tweens: A Pilot Study



Problem

Smart meters and home automation devices are increasingly being installed in residential households. These devices allow consumers to make decisions about the way they use energy (i.e., to lower utility bills, reduce environmental impact, benefit from dynamic pricing, etc.).

However, families with school-age children often do not benefit from these technologies because concerns about energy issues are often a low priority given that their energy lifestyles are constrained by routine. This makes it difficult for them to shift or reduce their demand.

Pilots

To investigate the efficacy of our program, we conducted two five-session workshops with 18 tweens from Girl Scout and Boy Scout troops in Northern California. Each troop consisted of 9 scouts. Scouts met in a local residence or community building for workshop sessions spread across five consecutive Saturdays and visited an energy lab (top). During these session we collected field notes. At the end of the last session, scouts completed a brief survey and provided program feedback.

Results

Scouts reported in their surveys and debrief:

- Learning about their energy consumption patterns at home and potential solutions to reduce energy use (81%, 14/18).
- Increasing comfort with regard to interpreting energy data and graphs (62%, 11/18).
- Found using home automation tools to be engaging (overall), but indicated that there were challenges with configuring them at home.



Fig 1: Scouts reviewed what they learned in previous sessions using gamified quizzes via the learning platform, Kahoot! (<https://kahoot.com>)

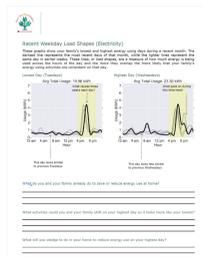
Know Your Energy Numbers



Know Your Energy Numbers (KYEN) is an energy education program targeting tweens. This five session workshop series seeks to educate young people and their families about energy issues and inform them about what they can do in response to improve residential energy efficiency. Each 90-minute session builds on the previous through:



Lecturettes (Fig 1) that are aimed at teaching students how energy is produced and consumed as well as energy related terms such as: smart grid, load shape, peak load, and time-of-use.



Students gather insights about their energy lifestyles by exploring energy data on their mobile devices and reviewing prototype energy visualizations specific to their household.



Team-based activities (e.g., measuring electric devices), design thinking techniques, and group presentations are introduced to help reinforce learning goals and brainstorm ways to save.



Students also perform at-home activities that provide an opportunity to use home automation devices (e.g., smart plugs) to implement the strategies discussed in the workshops.

Future Work

To complement the program, we are currently designing a mobile application that will allow students to access their real-time energy data and log information about energy using activities (Fig 2). The collected data will be used to design feedback that helps KYEN students learn about and influence their family's energy lifestyles.



Fig 2: Our prototype system relies on the Rainforest Automation EAGLE-200 home energy hub for access to real-time energy data (left) and we are designing real-time energy displays and learning modules that support the KYEN program's education goals through a collaboration with the METER team at The University of Oxford (right).

Acknowledgements

This work is supported by NSF grant #1737565. The authors would also like to thank Maeve Givens, Eszter Mészáros, Connery D. Wood, Kara Glenwright, Aditi Hosangadi, Su Ting Tan, Nikita Raj, Yusuf Rasheed, Sahil Singh, and Advait Prasad for their contributions.



For more information visit: <https://kyen.sites.stanford.edu/>

