

## Summary

Green Team Twente wants to research the use of hydrogen as sustainable energy source within households, that is why in 2018 they stepped to facility management of the university of Twente. Together they came to the conclusion they had to build a living lab on campus. This lab will have a hydrogen tank, but also setups concerning energy- and water sourcing, energy- and water storage, data collection and a group of tiny houses to make the outcome of the research more interesting, due to the actual household and real human behavior involved.

Tiny houses are not only interesting for the researchers of the living lab. There is a growing interest amongst Dutch people in tiny houses. It is a hip subject, but also a more sustainable and profitable way of living. This new popularity is mostly because of the new term and the motives to live in a smaller home. Next to that there is often little to no difference between living in a tiny house and a trailer camp or bungalow park. The term tiny house is American, where the tiny house movement was a counter movement against consumerism. In the Netherlands this is the cause of the growing interest as well. Minimalism and anti-consumerism are everywhere, in documentary's on Netflix, in books in the stores, the words decluttering and zero-waste are well known. Especially generation Z is very conscious about the importance of working on a more sustainable society. While right now tiny houses are mostly sold to a select group of middle-aged people, in ten years this could be the lifestyle of much larger and younger group.

Facility management wants to place houses for this target group, to execute research about the sustainable world they dream of. To obtain a suitable design for these houses the following question has been asked. What standards does a house for a student in 2020 and beyond need to meet and how can the interior of a house provide this in as small a space as possible?

The first part of the question is answered by examining literature, conducting interviews with experts in building and extensive research into the target group. Shortly there has been delved into the history of tiny houses, what is on the Dutch market at the moment considering small living, what the coming generation of students is like, what the housing market looks like for them and the basic of building a tiny house. There have been two surveys about the functionality in a household and the usage of these functions. Next to that, there has been a co-design session where 9 participants designed there own tiny house. There have been personal interviews to obtain more detailed information on the use of the functionality of a house and a few subjects have been followed in their daily pursuits to observe their behavior and recognize any problems that arise. From this research a program of requirements has been written.

In order to answer the second part of the question ideas have been generated using the outcomes of the above mentioned research. Hundreds of interviews and clips about tiny houses and there inhabitants have been looked at, furniture stores specialized in space saving interior have been visited, there have been conversations with experts in the area of space saving furniture, brainstorm were held with subject from the target group and lots of sketches and a semi-prototype were fabricated. All ideas generated in this phase were mapped in a morphologic scheme, classified on the basis of the outcome of the program of requirements. Using the information from the research the ideas were transformed into four concepts, which have been reviewed using a scaling method. The concept named Lift came out of this review as best concept. This idea was again revised according to the program of requirements and it was found that there are a few things that need to be looked into. This is the fact that there is no completely empty wall available for the research that the

psychologists want to conduct, the placement of the bed might lead to disturbed nights and in case of two people living in the house, how will the tiny house need to operate.